

Relationship between anxiety, loneliness, and sleep-disorders with social media addiction among adolescent

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Article Info

Article history:

Received Nov 12, 2023

Revised Mar 22, 2024

Accepted Apr 24, 2024

Keywords:

Adolescent

Anxiety

Loneliness

Sleep disorder

Social media addiction

ABSTRACT

In the digital era, social media usage has become an integral part of daily life, particularly among adolescents. This study investigates the relationship between anxiety, loneliness, sleep disorders, and social media addiction among adolescents. A cross-sectional study involving 290 X and XI-grade students utilized standardized instruments: the Bergen Social Media Addiction Scale (BSMAS), Zung Self-Rating Anxiety Scale (SAS/SRAS), UCLA Loneliness Scale Version 3, and Pittsburgh Sleep Quality Index (PSQI). Bivariate analysis was conducted using the Chi-square test ($p < 0.05$). Findings revealed 10.7% severe social media addiction, 21.4% severe anxiety, 4.8% significant loneliness, and 74.5% poor sleep quality. Significant associations were found between anxiety ($p = 0.013$), loneliness ($p = 0.010$), sleep disturbance ($p = 0.033$), and social media addiction. Higher anxiety, loneliness, and poor sleep quality correlate with increased susceptibility to social media addiction among adolescents. This underscores the importance of addressing psychological well-being in interventions aimed at mitigating social media addiction.

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1. INTRODUCTION

The escalating prevalence of social media addiction presents a critical concern globally, with reported cases surging fivefold over the past four years [1]. Indonesia, in particular, has witnessed a notable increase in Internet usage, accentuating the imperative for vigilant monitoring of social media consumption to mitigate addiction risks [2]. The phenomenon of social media addiction manifests as individuals succumbing to prolonged periods on these platforms, driven by intense interest, lack of self-control, and a dearth of constructive activities [3], [4].

Previous research indicates that adolescents spending 4-6 hours daily on social media are at risk of addiction, while those exceeding six hours fall into the addicted category [5]. Individuals aged 18-25 constitute the most active social media users, primarily utilizing it for communication purposes [6]. Excessive social media use among adolescents can lead to detrimental effects, including neglect of academic responsibilities, decreased study time, compromised academic performance, negative effects on mental and physical health, and decreased sleep quality [7]-[9], [10].

Adolescents' use of social media can have a negative impact if they cannot control their use of social media [11], [12]. Dependence on social media can result in adverse effects experienced by adolescents.

Adolescents become indifferent to their responsibilities as students, which results in delays in collecting school assignments, reduced study time, and school achievement experiences a drastic decline because adolescents are busy spending their time accessing social media [13]. The addictive nature of social media, especially for teenagers with poor self-control, can lead to overdependence and negative consequences [14]. Additionally, social media addiction has been linked to negative impacts on mental health among undergraduate nursing students [15].

Recent studies have revealed that social media is an integral part of adolescents' lives. In a survey conducted on American adolescents aged 13 to 17, it was discovered that 90% of the students reported using social media. Additionally, 35% of the students used social media frequently each day [16]. In another study conducted in East Anglia, England, it was found that 97.6% of female adolescent students aged 16 to 19 use social media. Of those, 27% use social media continually, while 68.3% do not set a time limit for it. Finally, a study conducted on 72 students found that 48.6% of adolescents had high levels of social media addiction, while 51.4% had low levels [17]. These findings demonstrate the pervasive nature of social media and highlight the importance of monitoring its use to avoid potential addiction.

The 2022 Indonesia National Adolescent Mental Health Survey (I-NAMHS) highlighted the prevalence of anxiety disorders among adolescents, indicating a common occurrence of anxiety-related issues in this population [18]. Individuals with social anxiety disorder tend to engage more frequently and actively on social media platforms [19]. This heightened social media usage among individuals with social anxiety can potentially lead to internet addiction or reliance on social media as a coping mechanism for anxiety [20], [21]. A national survey in Iceland reported that 85% of adolescent females and 69% of adolescent boys aged 14 to 16 years experienced anxiety [22]. Furthermore, another study found that 74% of respondents use social media networking sites regularly [23].

The high level of connectivity in the use of social media among today's young generation means that these platforms are considered to be contributing to the loneliness epidemic [17]. Individuals who use social media have difficulty socializing directly with others in the real world because they prefer social media. They also become quiet in the real world, don't care about the environment, and are selfish [24], [25]. Loneliness problems often occur in adolescents, with research showing high levels of loneliness among female adolescents in England [26]. Prolonged and unhealthy internet use can exacerbate feelings of loneliness over time [27]. Additionally, individuals with higher levels of loneliness may engage in excessive internet use as a coping mechanism, leading to a cycle of loneliness and internet addiction [28]. Furthermore, research has indicated a significant relationship between internet addiction, loneliness, and sleep quality among students, highlighting the interconnectedness of these factors in influencing students' well-being [29]. In addition, based on the Global Survey, approximately 6.12% of Indonesian teenagers reported experiencing loneliness within the past year [30]. Furthermore, another study revealed that up to 6.5% of teenage girls have encountered feelings of loneliness [31]. These findings highlight the prevalence of loneliness among adolescents and the need for further research and interventions to address this issue.

The relationship between social media use and sleep quality in adolescents has been extensively studied. Research by Shimoga *et al.* [32] and Scott *et al.* [33] found associations between frequent social media use and poor sleep quality or inadequate sleep patterns in adolescents. Similarly, studies by Longobardi *et al.* [34] and Varghese *et al.* [35] emphasized that nighttime social media use was linked to lower sleep quality and shorter sleep duration in adolescents [34], [35]. Moreover, the study by Sümen and Evgin [36] revealed that social media use was associated with poor sleep quality, anxiety, depression, and low self-esteem in adolescents. Additionally, research by Ni & Whitehouse [37] indicated that more frequent social media usage was correlated with higher levels of sleep deprivation and depressive symptoms among young adolescents.

Adolescents spend much time using social media, including at night and day. This can interrupt the sleep process, so the quality and pattern of sleep could be better. When they are about to start sleeping, the fact is that adolescents still ignore notifications from social media at any time, which has an impact on quality sleep. Many adolescents will find it difficult to concentrate due to lack of Sleep. Effect psychological lack of Sleep results in hyperactivity, lack of self-control, emotions, lack of agility, irritability, and annoyance [38], [39]. In the previous study on 576 adolescents in Iran, 34.8% of students went to bed at 1 a.m., 36.6% could fall asleep after 15 minutes, and 26.3% slept only six hours a day [40]. Research conducted on adolescent girls in England found that 73% of adolescents were sleep-deprived [17]. The previous findings suggest a significant association between anxiety and social media addiction and between loneliness and social media addiction and sleep disturbance [41].

Despite the growing body of literature documenting the individual impacts of social media addiction, there remains a paucity of research exploring the interplay between social media addiction, loneliness, anxiety, and sleep disturbance among adolescents. Addressing this gap in knowledge is crucial for developing comprehensive interventions aimed at mitigating the multifaceted impacts of social media addiction on adolescent well-being. Therefore, the aim of this study is to examine the relationship between anxiety, loneliness, sleep disorders, and social media addiction among adolescents.

2. METHOD

2.1. Design

This quantitative research study, utilizing a cross-sectional approach, was conducted at Public Senior High School 9 Padang and focused on students in grades X and XI who use social media and were willing participants. The participants were selected using convenience sampling techniques. The estimated sample size was determined using the Slovin formula, considering a population of approximately 799 students, a 5% margin of error, and a 99% confidence level, resulting in a minimum required sample size of 264 participants. To mitigate potential dropout rates, 10% was added to the calculated sample size, bringing the final sample size to 290 students [42].

2.2. Data collection

Data collection was conducted meticulously to ensure the validity and reliability of the gathered information. The research took place in May 2023, with meticulous planning and coordination among the research team members. Prior to the commencement of data collection, ethical clearance was obtained from the relevant research ethics committee to ensure compliance with ethical standards in research involving human participants. The primary researcher was closely assisted by a qualified guidance and counseling teacher from Public Senior High School 9 Padang, who provided valuable insights and support throughout the data collection process. Additionally, three trained enumerators were recruited and thoroughly briefed on the research objectives, data collection procedures, and ethical considerations. During data collection, standardized instruments and protocols were employed to maintain consistency and accuracy in data gathering. The participants, consisting of students in grades X and XI from Public Senior High School 9 Padang, were approached with transparency regarding the purpose and nature of the research. Informed consent was obtained from each participant or their legal guardians prior to their involvement in the study.

2.3. Data analysis

The collected data underwent rigorous analysis employing both descriptive and inferential statistical techniques. Univariate data analysis was initially performed to provide a comprehensive description of each variable under investigation, including anxiety, loneliness, sleep disturbance, and social media addiction. Descriptive statistics such as frequency distributions, percentages, means, and standard deviations were computed to summarize the characteristics and distribution of the variables. Furthermore, to explore the relationships between variables, the Chi-square test was employed as a statistical tool. The significance level was set at $p < 0.05$ to determine the presence of statistically significant associations between variables. The use of inferential statistics facilitated the examination of potential correlations and dependencies among the variables, thereby contributing to a deeper understanding of the research phenomena.

2.4. Research instrument

This study used questionnaires on social media use, anxiety, loneliness, and sleep disorders.

2.4.1. Social media use questionnaire

Questionnaire social media addiction refers to the Bergen Social Media Addiction Scale (BSMAS). Questionnaire This was developed by [43] which is a modification of the Questionnaire Facebook Addiction Scale (BFAS) [44]. The BSMAS questionnaire has already undergone validation and reliability testing conducted by Andreassen, yielding a Cronbach's Alpha score of $\alpha = 0.88$. This indicates that the tool possesses strong reliability. The scoring system categorizes individuals as addicted if their score is ≥ 60 , as having a medium level of addiction if their score falls between 42-65, and as not having an addiction if their score is < 42 . The Indonesian version of the Bergen Social Media Addiction Scale (BSMAS) has also undergone validity testing at the Dan Health Institute Jakarta Technology, with a total of 20 participants. The results indicate that 18 out of the 18 statements were deemed valid because the calculated 'r' (correlation coefficient) was greater than the 'r table' value.

2.4.2. Anxiety questionnaire

The Zung Self-Rating Anxiety Scale (ZSAS/ZSRAS) is an anxiety assessment tool that was developed by considering the symptoms of worry outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-II). The ZSAS/ZSRAS questionnaire has already been adapted and standardized for use in the Indonesian context, and its validity and reliability have been assessed. The validity of each item in the questionnaire ranged from a minimum of 0.663 to a maximum of 0.918. The reliability test yielded a result of 0.829, indicating that the questionnaire is reliable for measuring anxiety levels. In terms of categorizing anxiety levels based on the Zung-Self Anxiety Rating Scale (ZSAS), the following categories have been established: a score greater than 75 falls into the panic category, scores between 60 and 74 are classified as heavy anxiety,

scores between 45 and 59 are categorized as mild anxiety, and scores between 20 and 44 indicate no anxiety or a normal level of anxiety.

2.4.3. Loneliness questionnaire

The UCLA Loneliness Scale version 3 is a widely used tool in research to assess an individual's experience of loneliness. The UCLA Loneliness Scale version 3 has also been adapted for use in the Indonesian language, with validity index scores ranging from .320 to .658 and a high reliability coefficient of 0.883. This high reliability makes it a very dependable instrument for identifying feelings of loneliness in individuals. The most commonly used score categories for interpreting the results of the UCLA Loneliness Scale version 3 are as: i) a score between 20 and 34 indicates that the individual is not experiencing loneliness, ii) a score between 35 and 49 suggests low levels of loneliness, iii) a score between 50 and 64 indicates a moderate degree of loneliness, and iv) a score between 65 and 80 suggests that the individual is experiencing a very high level of loneliness [45].

2.4.4. Sleep disorders questionnaire

The Pittsburgh Sleep Quality Index (PSQI) is a highly effective tool used to assess the quality of sleep. It was developed by Buysse in 1989 with the aim of measuring and distinguishing between individuals who have good or poor sleep quality [46]. The PSQI questionnaire has been adapted into the Indonesian language, as modified by Setyowati and Chung in 2021 [47]. In their validity testing, Setyowatu and Chung found that the internal consistency test yielded a Cronbach's Alpha value of 0.79 and a validity fill score of 0.89, indicating that the PSQI questionnaire is a valid instrument for assessing sleep quality. The total score on the PSQI is obtained by summing the scores from each component, and it can range from 0 to 21. The commonly used interpretation of the results is as: i) a global score of ≤ 5 suggests good sleep quality and ii) a global score of > 5 indicates inadequate or poor sleep quality.

2.5. Ethical considerations

This research has passed the ethical test by the Health Research Ethics Committee of the Faculty of Nursing, Andalas University, Padang, with No.081.laiketik/KEPKFKEPUNAND on May 30, 2023. This research discusses the objectives, benefits, and research time, then explains the rights of respondents and the agreed time for carrying out the research process with respondents. The teacher knew and approved the research conducted on adolescents at Senior High School 9 Padang.

3. RESULTS AND DISCUSSION

3.1. Characteristics of participants

This According to Table 1, there were a total of 290 respondents in the study. Among these respondents, the majority were female, accounting for 158 individuals, which constitutes 54.5% of the total sample. Middle-aged adolescents made up the largest age group, with 260 respondents, representing 68.4% of the participants. Additionally, the average respondent belonged to the X class, making up 147 individuals, or 50.7% of the total sample. In terms of the duration of social media use, 150 respondents, or 51.7%, reported using social media for 5 to 6 hours or more.

Table 1. Characteristics of participants (n=290)

Variables	Category	f	%
Age	Middle adolescent	260	68.4
	Late adolescents	30	7.9
Gender	Male	132	45.5
	Female	158	54.5
Class	Grade 10	147	50.7
	Grade 11	143	49.3
Duration Use of Social-Media	<1 hour	6	2.1
	1-2 hours	43	14.8
	3-4 hours	91	31.4
	5- \geq 6 hours	150	51.7

3.2. Anxiety, loneliness, sleep disorders and social media addiction among participants

Table 2 explains the descriptions of anxiety, loneliness, sleep disorders, and social media addiction among respondents. The research results show that almost a quarter of respondents (21.4%) experienced severe anxiety, while half of them (50.0%) experienced mild anxiety. More than half of the respondents reported

feeling mildly lonely (50.3%), 37.6% felt moderately lonely, and 4.8% felt severely lonely. Most respondents reported poor sleep quality (74.5%). Regarding social media addiction, the majority of respondents reported experiencing moderate addiction, while 10.7% reported severe addiction.

Table 2. Distribution of anxiety, loneliness, sleep disorders and social media addiction among adolescents (n=290)

Variable	Category	f	%
Anxiety level	No anxiety	83	28.6
	Mild anxiety	145	50.0
	Severe anxiety	62	21.4
Loneliness level	No loneliness	21	7.2
	Mild loneliness	146	50.3
	Moderate loneliness	109	37.6
	Severe loneliness	14	4.8
Sleep disorders	Good sleep quality	74	25.5
	Poor sleep quality	216	74.5
Social media addiction level	No addiction	46	15.9
	Moderate addiction	213	73.4
	Severe addiction	31	10.7

3.3. Relationship between anxiety, loneliness, sleep disorders, and social media addiction

The data presented in Table 3 indicates that 113 adolescents, equivalent to 77.9%, who reported having mild anxiety also exhibited social media addiction. The Chi-square analysis yielded a significant p-value of 0.013, signifying a notable association between anxiety levels and social media dependency among adolescents. Similarly, adolescents with mild feelings of loneliness, totaling 108 individuals or 74%, displayed social media dependence. The Chi-square analysis result showed a significant p-value of 0.010 ($p < 0.05$), indicating a significant relationship between loneliness and social media addiction in adolescents.

Table 3. Relationship between anxiety, loneliness, sleep disorders, and social media addiction in adolescents Senior High School 9 Padang (n=290)

Variable	Category	Severe Addiction	Moderate Addiction	No Addiction	p-value
		f (%)	f (%)	f (%)	
Anxiety level	No anxiety	5 (6%)	59 (71.1%)	19 (22.9%)	0.013
	Mild anxiety	13 (9%)	113 (77.9%)	19 (13.1%)	
	Severe anxiety	12 (21%)	41 (66.1%)	8 (12.9%)	
Loneliness level	No loneliness	0 (0)	15 (71.4%)	6 (28.6%)	0.010
	Mild loneliness	10 (6.8%)	108 (74%)	28 (19.2%)	
	Moderate loneliness	20 (18.3%)	78 (71.6%)	11 (10.1%)	
	Severe loneliness	1 (7.1%)	12 (85.7%)	1 (7.1%)	
Sleep disorders	Good sleep quality	2 (2.7%)	58 (78.4%)	14 (18.9%)	0.033
	Poor sleep quality	29 (13.4%)	155 (71.8%)	32 (14.8%)	

3.4. Discussion

The relationship between anxiety, loneliness, sleep disorders, and social media addiction among adolescents has been a subject of recent research, particularly focusing on high school students. A study conducted among adolescents at Senior High School 9 Padang revealed a significant association between anxiety and social media addiction, with a notable proportion of respondents experiencing mild anxiety and moderate social media addiction. This finding underscores the interconnectedness of mental health factors and social media habits among adolescents.

Anxiety, characterized by symptoms such as fear, worry, and unease, has been identified as a key contributor to social media addiction among adolescents [48]. The study conducted at Public Senior High School 9 Padang aligns with previous research indicating that anxiety plays a crucial role in adolescents' engagement with social media platforms. Moreover, the impact of excessive social media use on sleep quality and mental health has been a focus of investigation. Studies have shown that problematic social media usage can lead to sleep disturbances, insomnia, and other mental health issues among adolescents. The association between social media addiction and sleep disorders has been highlighted in various studies, emphasizing the need to address the negative consequences of excessive social media use on adolescents' well-being. Furthermore, the prevalence of social media addiction among adolescents has raised concerns about its implications for mental health. Research has indicated that social media addiction can lead to negative outcomes such as depression, loneliness, and poor self-esteem among adolescents. Understanding the complex

interplay between social media use, mental health factors, and addictive behaviors is essential for developing effective interventions to promote healthy digital habits among adolescents. In conclusion, the research conducted among adolescents at Senior High School 9 Padang sheds light on the significant relationship between anxiety and social media addiction. By recognizing the impact of mental health factors on social media habits, educators, parents, and healthcare professionals can work together to support adolescents in maintaining a balanced approach to technology use and promoting their overall well-being.

This research revealed out that there is a significant correlation between loneliness and social media addiction among respondents ($p < 0.05$). Out of 290 respondents, 109 had moderate levels of loneliness, and among them, 71.6% showed moderate social media addiction and 18.3% had severe social media addiction. Additionally, out of the 14 respondents who experienced severe loneliness, 85.7% experienced moderate loneliness and 7.1% experienced severe loneliness. Previous study have also highlight the critical role of loneliness in linking peer phubbing to adolescent mobile social media addiction [49], increased social media use is associated with higher levels of loneliness [50], [51]. Social media platforms can provide opportunities for social connection and support, but excessive use or passive engagement with social media may contribute to feelings of loneliness [52]. Adolescents who feel lonely will prefer social media to enjoy the freedom of anonymity, compensate for weak social skills, and reduce feelings of loneliness. This means lonely individuals will access social media to seek comfort in making social contacts. Therefore, factors such as individual differences, specific social media platforms used, and the context of use can influence the relationship between social media use and loneliness.

The relationship between sleep disorders and social media addiction among adolescents also has been a subject of interest in this research. This finding underscores the impact of sleep disturbances on adolescents' engagement with social media platforms. The research conducted at SMA N 9 Padang aligns with previous studies that have highlighted the link between poor sleep quality and high social media usage. For instance, a study in the western region of Turkey found that social media addiction in high school students decreases students' sleep efficiency ($p < 0.05$) [36]. Another study in Iran stated that there was a significant relationship between poor sleep quality and high use of social media [40]. Adolescents who struggle with sleep and turn to social media, especially at night, may inadvertently develop social media addiction due to continuous engagement with online platforms without regard for time constraints.

4. CONCLUSION

A Senior High School 9 Padang study aimed to determine the correlation between anxiety, loneliness, sleep disorders, and social media addiction. The researchers concluded that 10.7% of adolescents have a heavy social media addiction, 21.4% have severe anxiety, 4.8% have loneliness, and the majority of adolescents have poor sleep quality 74.5%. The Chi-square test results concluded a significant relationship between anxiety with social media $p = 0.013$, loneliness with social networks $p = 0.010$, and sleep disorders with social networking $p = 0.033$. Hopefully, the school will be able to create a policy regarding using social media in the school environment, prohibiting students from using cell phones during learning and only allowing students to use cell phones during break time. It is hoped that the school will also provide counseling regarding the problem of social media addiction among adolescents in the school environment, counseling for mental health services in the school environment, and implementing self-help strategies. Help book to overcome loneliness in adolescents using story writing techniques, as well as collaborating with health workers to provide health education about sleep hygiene to overcome sleep disorders in students.

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