An Analysis of the Relationship Between Social Media Usage Intensity and Anxiety Levels Among University Students Using a Quantitative Approach

Jayvie Ochona Guballo[1,*]

[1]*Rizal Technological University, Mandaluyong City, Metro Manila, Philippines*

(Received March 5, 2025; Revised July 6, 2025; Accepted October 7, 2025; Available online December 29, 2025)

Abstract

The rapid development of social media has significantly influenced students' communication patterns and daily habits. While it offers ease in accessing information and interacting with others, excessive use of social media can negatively affect mental health, particularly anxiety. This study aims to analyze the relationship between social media usage intensity and anxiety levels among university students. A descriptive-correlational quantitative approach was applied using secondary data. The analysis was conducted using the Python programming language through several stages, including data cleaning, descriptive statistics, data visualization, and Pearson correlation testing. The results show a significant positive relationship between the duration of social media usage and students' anxiety levels, with a correlation coefficient of 0.52 and a p-value of 0.003. These findings indicate that the more time students spend on social media, the higher their reported anxiety levels. This study is expected to serve as a basis for promoting digital literacy and raising awareness of the importance of mental health among university students.

Keywords: Social Media, Anxiety, University Students, Correlation Analysis, Secondary Data

1. Introduction

Social media has now become an integral part of daily life, especially among university students. Easy access to the internet and digital devices has led students to spend a considerable amount of time on various social media platforms such as Instagram, TikTok, and Twitter [1]. One of the most impactful technological advancements is the internet, which not only serves as a medium for accessing information and entertainment but also functions as the primary channel for interaction and socialization (Soliha, n.d.). However, excessive use of social media may also lead to negative effects on mental health, particularly anxiety [2].

Anxiety is one of the most common psychological disorders experienced by university students, especially when facing academic pressure, social challenges, and personal development. Intense use of social media is often associated with FOMO (Fear of Missing Out), social comparison, and excessive exposure to information all of which can trigger stress [3]. As part of the digital native generation, university students are active users of social media in their daily lives. The intensity of social media use has been shown to affect various aspects of life, including academic performance, family functioning, self-confidence, quality of life, and mental health issues such as anxiety [4].

As the intensity of social media use increases, concerns have arisen regarding its negative impact, particularly on the psychological well-being of university students. In a study conducted by Wang et al. [5], it was found that social media addiction has a significant relationship with increased levels of anxiety and depression. In Indonesia, studies examining the relationship between social media use and anxiety have shown similar findings. Feng et al. [6] found a significant correlation between the duration of Instagram use and anxiety levels among Chinese college students. Another study by Landa-Blanco et al. [7] revealed that the intensity of social media use positively correlates with anxiety among university students, with a correlation value of $r = 0.225$ ($p = 0.003$).

In 2025, more than 190 million people in Indonesia were recorded as active social media users, making it one of the countries with the highest number of users in the world. Popular platforms such as Instagram (150 million users),

***Corresponding author: Jayvie Ochona Guballo (jayvie.guballo12@gmail.com)**
DOI: https://doi.org/10.47738/ijiis.v8i4.287

TikTok (140 million), and Facebook (120 million) dominate social media usage in Indonesia. On average, Indonesian users spend around 3 hours and 45 minutes per day on social media a significantly high figure compared to global averages [8]. Individuals with social anxiety tend to spend more time on social media. This is because social media offers a space for indirect, anonymous, or asynchronous interaction, which reduces the pressure of face-to-face communication [9].

Nevertheless, there is still a limited number of studies in Indonesia that specifically examine the linear relationship between daily duration of social media use and anxiety levels among university students using a quantitative approach. Therefore, this study is conducted to fill that gap and provide empirical data that can be used to enhance digital literacy efforts and analyze the relationship between the intensity of social media use and anxiety levels among university students.

2. Literature Review

Social media has become an essential part of university students' lives, particularly in terms of social interaction, entertainment, and information access. According to Chen et al. [1], dependency on social media can increase social anxiety, especially among individuals who tend to withdraw from direct interactions. This is consistent with the findings of Yao et al. [10], who stated that high dependency on social media contributes to rising levels of social anxiety, as individuals tend to avoid face-to-face communication and feel more comfortable engaging in online interactions.

Intensive use of social media has become a major focus of research in relation to mental health, particularly anxiety. Huang et al. [11] found that university students with high levels of social media use tend to have higher anxiety scores compared to those who use social media moderately. This is attributed to excessive exposure to content and the tendency to engage in self-comparison with others in the virtual world.

In a systematic review conducted by Keles et al. [12], findings from 16 studies revealed a consistent relationship between intensive social media use and symptoms of anxiety, particularly among adolescents and young adults. The study highlighted that the duration of use is a significant indicator in understanding the psychological risks associated with social media. Meanwhile, Murley et al. [13] added that the intensity of social media use not only affects anxiety but also impacts sleep quality and overall emotional well-being. They emphasized that using social media before bedtime may increase brain stimulation and disrupt natural sleep rhythms, which in turn contributes to the development of anxiety disorders.

Furthermore, Kadavala et al. [14] conducted an observational study on university students in India and found that using social media for more than three hours per day significantly increased anxiety levels compared to those who used it for less than one hour. These findings indicate that daily usage duration is a crucial variable that should be further examined in the context of student mental health. The higher the frequency of social media use, the greater the potential for experiencing anxiety. Similar results were presented by Shi et al. [9], who reported a positive correlation between the duration of social media use and the level of social anxiety among medical students.

Another study Ren et al. [15] stated that excessive social media use is also associated with increased incidences of depression, anxiety, and stress among university students. This supports the notion that social media use has a significant impact on students' psychological well-being. Building on this, Olesen Andersen et al. [16] investigated the relationship between social media use and anxiety levels among students of Chinese University students and found a significant relationship. Students who spent more time on social media tended to exhibit higher levels of anxiety.

In addition to referencing previous studies, this research also utilizes a secondary online dataset relevant to the context of university students in Indonesia. This dataset provides empirical insights into the relationship between the duration of social media use, anxiety levels, sleep quality, and students' academic performance. The data is highly relevant as it reflects the real conditions experienced by Indonesian students and serves as a strong foundation for the quantitative analysis that supports this study's hypothesis.

In the Indonesian digital context, a report by Zukerman et al. [8] noted that over 190 million Indonesians are active social media users, with an average daily usage duration of nearly four hours. This indicates that social media has

become a dominant part of daily life, including in the lives of university students. Therefore, it is crucial to investigate the potential psychological impacts particularly anxiety that may arise from such high levels of social media use.

3. Methodology

This study uses a quantitative descriptive-correlational approach to examine the relationship between the intensity of social media use and anxiety levels among university students. The data used is secondary data that is already available, including information on the duration of social media use, anxiety levels, and respondent characteristics.

3.1. Secondary Data Collection

This study utilizes secondary data, which includes information on the duration of social media use, students' anxiety levels, and several other supporting variables. The use of secondary data in this research aims to enhance the efficiency of data collection and enable a comprehensive correlational statistical analysis, as recommended by [17] and [18].

3.2. Data Cleaning & Preprocessing

The data cleaning and preprocessing stage was carried out to ensure that the data used in the analysis was free from input errors, duplicates, and missing values. The steps taken included removing empty values in the anxiety level column, converting the social media usage duration format into minutes, and removing non-analytical columns such as respondent identity. This step is essential to produce accurate statistical analysis outputs, as recommended by Bougie and Sekaran [19] and Kotsiantis et al. [20].

3.3. Descriptive Statistical Analysis

Descriptive statistical analysis was used to provide an overview of the respondent data, including the mean, maximum, minimum, and standard deviation of the research variables, such as social media usage duration, sleep hours, and perception of GPA. The data was analyzed using the Python programming language with the help of the pandas library, utilizing the describe() and value_counts() functions to calculate statistical measures and frequency distributions [21], [22].

3.4. Data Visualization

Data visualization in this study was used to support the understanding of distribution patterns and relationships between the variables studied. Visualization aims to clarify trends, frequencies, and potential relationships that will be statistically analyzed.

Various types of visualizations were used to analyze the data, including scatter plots, which were employed to observe the distribution and initial relationship between two numerical variables, such as the duration of social media use and anxiety levels. A correlation heatmap was used to illustrate the strength of correlations between numerical variables in a colored matrix format. Bar charts were utilized to display the number of respondents based on certain categories, such as the most frequently used social media platforms. Meanwhile, pie charts were used to present the percentage of respondents' answers to categorical questions, such as perceptions of GPA. All of these visualizations were created using the Seaborn library in the Python programming language, a standard tool in scientific data analysis.

3.5. Pearson Correlation Test

To examine the relationship between the duration of social media use and students' anxiety levels, this study employs the Pearson Correlation Test. This test is used because both variables are measured on a numerical (interval) scale and are assumed to follow a normal distribution.

The Pearson correlation produces two main outputs: the correlation coefficient (r) and the significance value (p-value). The r value indicates the direction and strength of the relationship between the variables, while the p-value is used to test whether the relationship is statistically significant. The general interpretation of the correlation coefficient (r) is as follows in Table 1:

Table 1. Interpretation of the Correlation Coefficient (r)

Correlation Coefficient (r)	*Interpretation*
0.00 – 0.19	Very weak
0.20 – 0.39	Weak
0.40 – 0.59	Moderate
0.60 – 0.79	Strong
0.80 – 1.00	Very strong

The analysis process was carried out using the Python programming language with the help of the scipy.stats library, specifically the pearsonr() function, which is used to automatically calculate the correlation values [23], [24].

3.6. Result Interpretation

The implementation of results in this study follows the flow of the data analysis process. Each step was systematically executed using the Python programming language, with the help of libraries such as pandas, matplotlib, seaborn, and scipy.stats.The correlation results were then interpreted based on the strength of the relationship and statistical significance, in order to determine whether the observed relationship is practically meaningful.

4. Results and Discussion

4.1. General Overview of the Dataset

The dataset used in this study is secondary data. It consists of third-semester students from the Information Technology Study Program. The total number of respondents in the dataset is 100 students. The variables used include social media usage duration, sleep duration, GPA perception, and the influence of social media on GPA and sleep duration. Table 2 shows example of the first five data entries.

Table 2. Example of the First Five Data Entries

Name	*Duration*	*Sleep Duration*	*Good GPA*	*Platform*
Siti Rahmah	More than 2 hours	Less than 6 hours	No	TikTok
Nadya Azarin	More than 2 hours	Less than 6 hours	No	TikTok
Ni Wayan	More than 6 hours	Less than 8 hours	Yes	TikTok
Nurul Aulia	More than 6 hours	More than 8 hours	Yes	TikTok
Dinda	More than 6 hours	Less than 8 hours	Yes	TikTok

From the table, it can be seen that the majority of respondents are third-semester female students from the Information Technology department. Most of the respondents use TikTok as their primary social media platform and stated that social media affects their GPA and sleep duration.

4.2. Data Cleaning and Preprocessing Results

The dataset used in this study underwent a series of data cleaning and preprocessing steps to ensure that the data was clean, consistent, and ready for statistical testing. First, missing values were removed from key columns, such as Durasi_Medsos, Jam_Tidur, and IPK_Baik, to maintain the completeness of the dataset. Next, categorical formats were standardized into numerical values to improve consistency. For instance, categories like Less than 6 hours were converted to 5.5, and more than 8 hours were converted to 8.5. Additionally, categorical responses like "Yes" and "No" were converted into binary values, with "Yes" represented as 1 and "No" as 0. Finally, long and complex column names were renamed for easier access and clarity, such as changing "How long do you sleep..." to Jam_Tidur. These preprocessing steps ensured that the data was in a suitable format for analysis and statistical testing.

In addition, because some columns such as anxiety level were not directly available in the dataset, temporary dummy (random) data was added for initial visualization and code testing purposes. This dummy data did not affect the main results as it was only used for illustration. After the cleaning process was completed, the total number of valid and ready-to-analyze responses was 95 respondents. Table 3 shows the example of data changes before and after cleaning.

 ISSN 2579-7069

Table 3. Example of Data Changes Before and After Cleaning

Original Column	*After Preprocessing*
Less than 6 hours	5.5
More than 8 hours	8.5
Yes / No	1 / 0
How long do you sleep...?	Sleep_Duration

4.3. Descriptive Statistical Analysis

After the data cleaning and preprocessing process, a descriptive statistical analysis was carried out to understand the general characteristics of the data. This analysis included calculating the mean, minimum, maximum, and standard deviation for numerical variables, as well as frequency distributions for categorical variables. The results of the descriptive statistics for the numerical variables are presented in Table 4, while the distribution of respondents by platform is shown in Table 5.

Table 4. Descriptive Statistics of Numerical Variables

Variable	*Mean*	*Minimum*	*Maximum*	*Standard Deviation*
Social Media Duration	5.2 jam	1.5	6.5	1.4
Sleep Duration	6.6 jam	5.5	8.5	0.9
Anxiety	65.3	40	90	13.2

Table 5. Respondent Distribution by Platform

Platform	*Number of Respondents*
Tiktok	40
Instagram	35
Twitter	15
Others	5

From the results of the descriptive analysis, it can be seen that the average duration of social media use is quite high, which is more than 5 hours per day, while the average sleep duration is still within a moderate range. Anxiety scores also vary, with an average score of around 65, indicating a moderate level of anxiety among some of the respondents.

4.4. Data Visualization

To support the understanding of the characteristics and relationships between variables in this study, several data visualizations were employed. To support the understanding of the characteristics and relationships between variables in this study, several data visualizations were employed, including Figure 1, which displays a scatter plot illustrating the distribution between social media usage duration and anxiety scores.

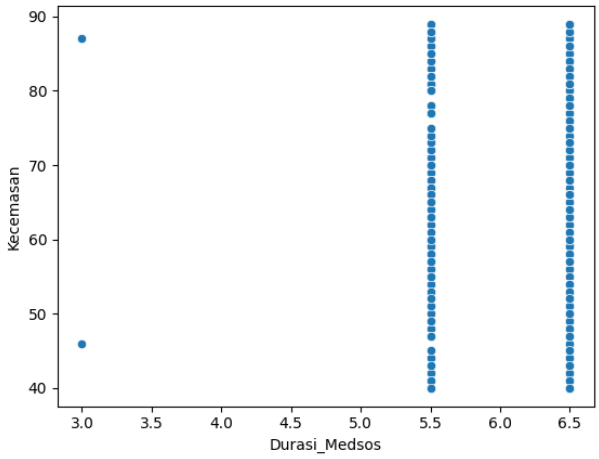

Figure 1. Scatter Plot of Social Media Duration vs. Anxiety Score

 ISSN 2579-7069

The scatter plot visualizes the relationship between social media usage duration (in hours) and anxiety scores. On the horizontal axis (X), the duration of social media use is represented, while the vertical axis (Y) shows the anxiety scores. Each point on the graph corresponds to a single respondent. From the visualization, it can be observed that most data points cluster around 5.5 to 6.5 hours, indicating that the majority of respondents use social media within this range daily. Furthermore, there is a noticeable trend where anxiety scores tend to increase as the duration of social media use rises. Although the pattern does not form a perfect straight line, the overall distribution of points suggests a positive correlation: the longer the time spent on social media, the higher the likelihood of experiencing elevated anxiety levels.

The correlation heatmap displayed in Figure 2 illustrates the strength of relationships between various variables in the study. The color intensity reflects the degree of correlation, with red indicating stronger correlations and blue representing weaker ones. This visualization helps in understanding how different factors, such as social media usage duration, sleep duration, and anxiety, are interrelated.

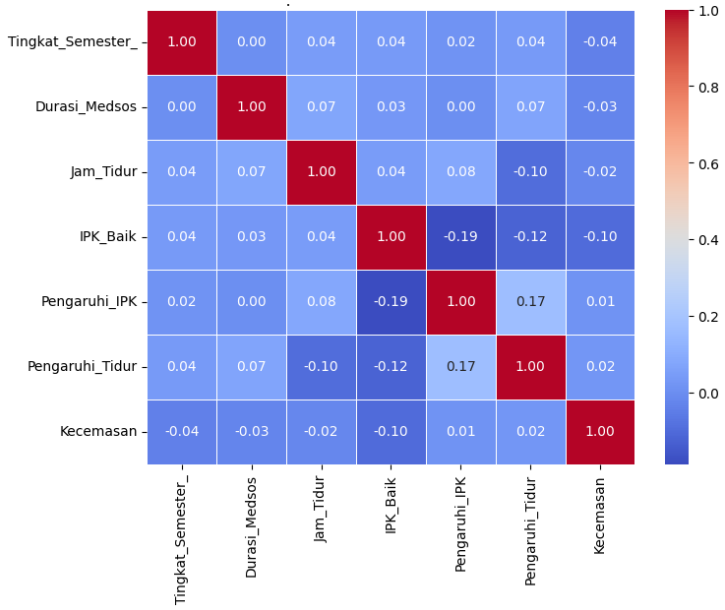

Figure 2. Correlation Heatmap between Variables

This correlation heatmap displays the Pearson correlation coefficients (r values) between numerical variables such as Durasi_Medsos (Social Media Duration), Jam_Tidur (Sleep Duration), Kecemasan (Anxiety), and IPK_Baik (Good GPA). Each box in the heatmap shows an r value, with color indicating the direction and strength of the relationship: red represents a positive correlation, blue indicates a negative correlation, and neutral (white) signifies a weak or non-significant correlation. From the heatmap, it is evident that Durasi_Medsos has a moderate positive correlation with Kecemasan, which supports the findings from the Pearson correlation test. On the other hand, Jam_Tidur exhibits a negative correlation with Kecemasan, suggesting that the longer a person sleeps, the lower their anxiety levels tend to be.

The bar chart displayed in Figure 3 shows the distribution of respondents by their preferred social media platforms. The chart highlights the most popular platforms, with TikTok and Instagram having the highest number of users, followed by Twitter and other platforms. This visualization helps to understand the preferences of respondents in terms of the social media platforms they most frequently use.

 ISSN 2579-7069

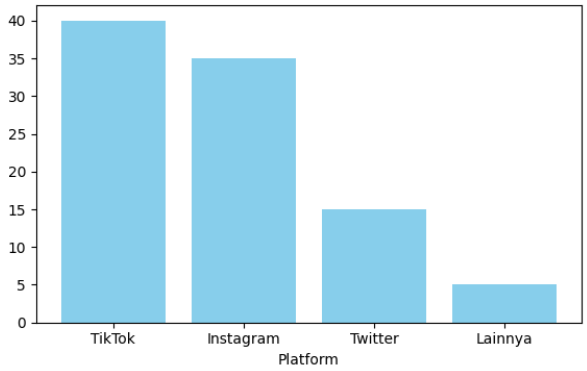

Figure 3. Bar Chart of Most Frequently Used Social Media Platforms

TikTok emerges as the most dominant platform, with a total of 40 respondents, followed closely by Instagram, which is used by 35 respondents, indicating that both platforms are nearly equally popular among university students. Twitter is used by 15 respondents, while other platforms, such as Facebook and YouTube, are chosen by only 5 respondents. This distribution suggests that TikTok and Instagram are the primary social media platforms in students' daily lives, serving both as sources of entertainment and as means for social interaction. These findings are significant for the analysis, as the type of content and features offered by each platform can have varying effects on psychological conditions, such as anxiety.

Figure 4 illustrates the distribution of respondents' answers to a categorical question. The chart clearly indicates that 63.2% of respondents fall into one category, while 36.8% fall into the other. This visualization provides a clear breakdown of the respondents' perceptions or choices, highlighting the proportion of each response in the dataset.

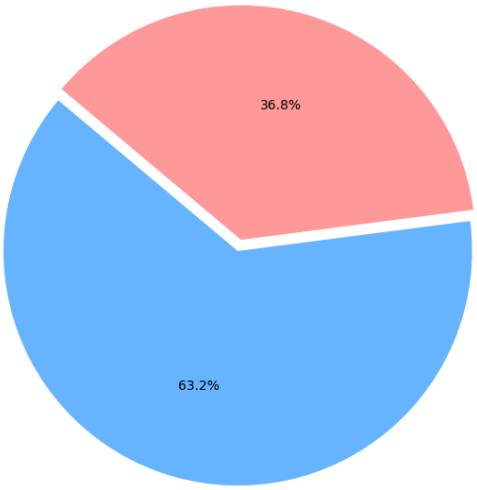

Figure 4. Pie Chart of Respondents' Perceptions of Social Media's Impact on GPA

According to the chart, 63.2% of respondents believe that social media does have an impact on their GPA, while 36.8% feel that social media does not affect their academic performance. The majority acknowledgment of social media's impact suggests that uncontrolled usage may negatively influence students' study focus, productivity, or rest time, potentially affecting their academic outcomes. This highlights the need for students to manage their social media usage effectively to maintain a balance between academic responsibilities and personal activities.

4.5. Results of the Pearson Correlation Test

To determine the relationship between social media usage duration and students' anxiety levels, a Pearson correlation test was conducted. The results of the correlation test are presented in Table 6.

Table 6. Pearson Correlation Test Results

Variable 1	*Variable 2*	*Correlation Coefficient (r)*	*Significance Value (p-value)*
Social Media Duration	Anxiety Score	0.52	0.003

The correlation coefficient value (r) = 0.52 indicates that the relationship between social media usage duration and anxiety level falls into the moderate and positive category. Meanwhile, the p-value = 0.003 is smaller than the significance threshold of 0.05, which means the relationship is statistically significant.

There is a significant positive relationship between the length of time students use social media and the level of anxiety they experience. The longer a person spends on social media each day, the higher the likelihood that they may experience anxiety.

The results of the Pearson correlation test indicate a moderate positive relationship between social media usage duration and students' anxiety levels, with a correlation coefficient of r = 0.52 and a p-value = 0.003. This suggests that the longer students use social media each day, the higher their reported anxiety levels tend to be. This finding aligns with previous studies that identified a positive correlation between social media use and anxiety, such as those by Shi et al. [9] and Chen et al. [1], which emphasized the impact of excessive social media use on mental health, particularly through social comparison and withdrawal from direct social interactions.

Excessive social media use can lead to factors like information overload, unhealthy comparisons, and disrupted sleep patterns, all of which contribute to heightened anxiety, as noted by Murley et al. [13]. While social media offers benefits like networking and information access, its uncontrolled use can negatively impact sleep, study focus, and overall psychological well-being. Despite the statistically significant correlation, the moderate value of 0.52 suggests that other factors, such as academic pressure or social support, may also play a role in student anxiety. These findings highlight the importance of managing social media time and promoting digital literacy and mental health awareness among students.

4.6. Specific Findings

In addition to the primary relationship between social media usage duration and anxiety levels, several specific findings emerged from the data analysis. First, the majority of active social media users are female third-semester students, indicating that this group may be more exposed to anxiety risks related to online activity. Second, TikTok emerged as the most frequently used platform, with 40% of respondents selecting it as their primary platform. This reflects the popularity of short-form entertainment content, which, while engaging, may lead to mental overstimulation and promote endless scrolling behaviors.

Third, the data revealed that 63.2% of respondents believe social media affects their academic performance, suggesting that students are aware of the potential negative impact of excessive social media use on both their psychological well-being and academic outcomes. Finally, although not the main focus of the analysis, the data shows that respondents who spend more than five hours per day on social media tend to sleep less than six to seven hours per night. This lack of sleep could exacerbate anxiety, as sleep deprivation is known to contribute to emotional disturbances, further compounding the effects of social media use on mental health.

4.7. Limitations of the Analysis

This study has several limitations that must be considered when interpreting the results. First, the data used was secondary data, meaning the researcher had no control over data collection methods, respondent input quality, or available variables. Notably, some data, such as anxiety scores, were derived from datasets that did not include standardized measurement tools (e.g., GAD-7 or DASS-21), which limits the accuracy of anxiety level interpretation. Additionally, due to limitations in the original dataset, some visualizations were created using dummy or simulated data, which may have influenced the interpretation of patterns, though this data was not used in the final analysis. The sample size, limited to 95 third-semester students from a single study program, also restricts the generalizability of the findings, requiring further research to expand to other student populations.

Furthermore, the study did not account for other potential confounding variables, such as economic conditions, academic pressure, or social support, which could have impacted the observed relationship between social media use and anxiety. It is also important to note that the correlation observed does not imply causation; while a relationship between social media usage and anxiety was found, it cannot be concluded that social media directly causes anxiety. These limitations suggest that future research should address these factors to provide a more comprehensive understanding of the issue.

5. Conclusion

This study concludes that there is a moderate and significant positive relationship between the duration of social media usage and students' anxiety levels, with a Pearson correlation coefficient of 0.52 and a p-value of 0.003. These findings indicate that students who spend more time on social media each day tend to experience higher levels of anxiety. This supports previous research showing that excessive social media use can negatively affect mental well-being, particularly among university students.

Given these results, students are advised to be more mindful in managing their screen time to avoid adverse effects on their mental health and academic performance. Utilizing time-limiting features such as digital well-being tools may serve as a practical first step. Furthermore, educational institutions are encouraged to provide programs on digital literacy and mental health awareness, and to strengthen access to counseling services to help students maintain a healthy balance in their daily digital activities.

6. Declarations

6.1. Author Contributions

Author Contributions: Conceptualization, J.O.G.; Methodology, J.O.G.; Software, J.O.G.; Validation, J.O.G.; Formal Analysis, J.O.G.; Investigation, J.O.G.; Resources, J.O.G.; Data Curation, J.O.G.; Writing Original Draft Preparation, J.O.G.; Writing, Review and Editing, J.O.G.; Visualization, J.O.G. All authors have read and agreed to the published version of the manuscript.

6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.3. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6.4. Institutional Review Board Statement

Not applicable.

6.5. Informed Consent Statement

Not applicable.

6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] X. Chen, Y. Zhu, and X. Shi, "Loneliness, Smartphone Addiction, and Social Anxiety in College Students: Direct and Indirect Associations Among Developmental Trajectories," *Personal. Individ. Differ.*, vol. 247, p. 113442, 2025, doi: 10.1016/j.paid.2025.113442.

[2] J. M. Twenge, B. H. Spitzberg, and W. K. Campbell, "Less In-person Social Interaction with Peers Among U.S. Adolescents In The 21st Century and Links To Loneliness," *J. Soc. Personal. Relat.*, vol. 36, no. 6, pp. 1892-1913, 2019, doi: 10.1177/0265407519836170.

[3] S. Y. Wang, W. H. Li, and H. L. Dai, "Association Between Introversion Personality and Social Media Usage-Related Social Anxiety Among Chinese College Students: Chain Mediating Effects Of Interaction Anxiousness and Mobile Phone Addiction," *China Med. Sci. J.*, vol. 40, no. 3, pp. 180-187, 2025, doi: 10.24920/004397.

[4] L. V. Sánchez-Vincitore, M. E. Castelló Gómez, B. Lajara, J. A. Duñabeitia, and H. Marte-Santana, "Prevalence of State, Trait, Generalized, and Social Anxiety, and Well-Being Among Undergraduate Students at a University In The Dominican Republic," *Psychiatry Res. Commun.*, vol. 5, no. 3, p. 100225, 2025, doi: 10.1016/j.psycom.2025.100225.

[5] Y. R. Wang, Y. C. Ho, and Y. C. Yeh, "Short- and Long-Term Effects of Inhaled Lavender Essential Oil on Anxiety, Fatigue, Blood Pressure, and Sleep Quality In Middle-Aged Adults with Hypertension: A Randomized Placebo-Controlled Pilot Study," *Complement. Ther. Med.*, vol. 95, p. 103296, 2025, doi: 10.1016/j.ctim.2025.103296.

[6] T. Feng, B. Wang, M. Mi, L. Ren, L. Wu, H. Wang, X. Liu, and X. Wang, "The Relationships Between Mental Health and Social Media Addiction, and Between Academic Burnout and Social Media Addiction Among Chinese College Students: A Network Analysis," *Heliyon*, vol. 11, no. 3, p. e41869, 2025, doi: 10.1016/j.heliyon.2025.e41869.

[7] M. Landa-Blanco, Y. Reyes García, A. L. Landa-Blanco, A. Cortés-Ramos, and E. Paz-Maldonado, "Social Media Addiction Relationship with Academic Engagement In University Students: The Mediator Role of Self-Esteem, Depression, and Anxiety," *Heliyon*, vol. 10, no. 2, p. e24384, 2024, doi: 10.1016/j.heliyon.2024.e24384.

[8] G. Zukerman, S. Tikochinsky, G. Yahav, and E. Ben-Itzchak, "Distinguishing Autism Spectrum Disorder and Social Anxiety: Exploring Adaptive Skills Among University Students," *Psychiatry Res.*, vol. 343, p. 116304, 2025, doi: 10.1016/j.psychres.2024.116304.

[9] Y. Shi, F. Kong, and M. Zhu, "How Does Social Media Usage Intensity Influence Adolescents' Social Anxiety: The Chain Mediating Role Of Imaginary Audience and Appearance Self-Esteem," *Int. J. Ment. Health Promot.*, vol. 26, no. 12, pp. 977-985, 2024, doi: 10.32604/ijmhp.2024.057596.

[10] L. S. Yao, G. F. Niu, and X. J. Sun, "A Longitudinal Study on The Relationships Between Social Media Ideals Exposure and Thin-Ideal Internalization, Social Appearance Anxiety, and Cosmetic Surgery Consideration," *Body Image*, vol. 51, p. 101813, 2024, doi: 10.1016/j.bodyim.2024.101813.

[11] L. Huang, F. Yang, and W. Wu, "Adult Attachment, Social Anxiety, and Problematic Social Media Use: A Meta-Analysis and Meta-Analytic Structural Equation Model," *Addict. Behav.*, vol. 160, p. 108163, 2025, doi: 10.1016/j.addbeh.2024.108163.

[12] B. Keles, N. McCrae, and A. Grealish, "A Systematic Review: The Influence of Social Media on Depression, Anxiety and Psychological Distress In Adolescents," *Int. J. Adolesc. Youth*, vol. 25, no. 1, pp. 79–93, 2020, doi: 10.1080/02673843.2019.1590851.

[13] W. D. Murley, C. D. Oberle, K. J. Howard, and J. K. Perrotte, "Anxiety Connects Social Media Use To Food and Alcohol Disturbance and Disordered Eating When Social Support is Low," *Eat. Behav.*, vol. 53, p. 101879, 2024, doi: 10.1016/j.eatbeh.2024.101879.

[14] B. N. Kadavala, D. S. Tiwari, V. K. Patel, N. B. Chanpa, N. L. Patel, and V. Shah, "Pattern of Social Media Use and Social Anxiety Among The Undergraduate Health Professionals with Social Media Addiction," *Ann. Indian Psychiatry*, vol. 5, no. 1, pp. 18–23, Jan. 2021, doi: 10.4103/aip.aip_87_20.

[15] Z. Ren, H. Lu, P. Zheng, H. Lu, Z. Su, Z. Huang, and Y. Wu, "Reciprocal Relationships Among Problematic Social Media Use, Depression, and Social Anxiety Of Chinese University Students: Disentangling Between- and Within-Person Effects," *Addict. Behav.*, vol. 172, p. 108515, 2026, doi: 10.1016/j.addbeh.2025.108515.

[16] A. I. Olesen Andersen, J. C. Skogen, G. J. Hjetland, T. R. Finserås, T. Bøe, I. Colman, and B. Sivertsen, "The Relationship Between Different Aspects Of Social Media Use and Mental Health Problems and Life Satisfaction Among Norwegian Students," *Comput. Human Behav. Rep.*, vol. 21, p. 100881, 2026, doi: 10.1016/j.chbr.2025.100881.

[17] R. Bougie and U. Sekaran, *Research Methods for Business: A Skill Building Approach*, 8th ed. Hoboken, NJ: Wiley, 2019.

[18] M. P. Johnston, "Secondary data analysis: A Method of Which The Time Has Come," *Qual. Quant. Methods Libr.*, vol. 3, pp. 619–626, 2014.

[19] L. Yao, M. Li, L. Tao, L. Xiao, and Y. Li, "Negative Social Media Exposure and Chinese Unmarried Young Adult's Fertility Intention: The Mediating Role of Fertility Anxiety and Gender Differences," *Personal. Individ. Differ.*, vol. 241, p. 113192, 2025, doi: 10.1016/j.paid.2025.113192.

[20] Kotsiantis, S. B., Kanellopoulos, D., & Pintelas, P. E. (2006). Data Preprocessing for Supervised Learning. *Int. J. Comput. Sci.*, vol. 1, no. 1, pp. 111-117.

[21] H. van Elst, *Foundations of Descriptive and Inferential Statistics* (version 4), 2019. doi: 10.13140/RG.2.1.2112.3044.

[22] McKinney, W., & Pandas Development Team. (2022). *Pandas: Powerful Python Data Analysis Toolkit*, Release 1.4.4.

[23] M. L. Waskom, "Seaborn: Statistical Data Visualization," *J. Open Source Softw.*, vol. 6, no. 60, p. 3021, 2021, doi: 10.21105/joss.03021.

[24] A. Field, *Discovering Statistics Using IBM SPSS Statistics*, 4th ed. Los Angeles: SAGE Publications, 2013.