

# Factors on Students Social Media Addiction and its Outcomes Based on Multiple Linear Regression Model

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**Abstract.** Social media becomes increasingly important for students for entertainment, learning and social activities. However, more students are diagnosed as addicted to social media, influencing their daily life. Hence, this paper analyzes a cross-national data set of students from high school or university. By applying multiple linear regression model, this study explored the relationship between eleven different factors and students' addiction level, trying to find out what were the major causes of students' social media addiction (SMA) and whether it would have detrimental effects on students' daily life, including academic performance and mental health. To ensure the accuracy of data analysis, collinearity diagnosis is applied. In conclusion, Age, Academic Level and Average Daily Use Hours are the major causes of SMA. Students with a younger age or lower educational level have a higher risk of addicted to social media. Longer usage hours or higher frequency also alleviates the tendency. SMA would detrimentally affect students' sleep quality and academic performance, and it also leads to mental illness. However, there was no evident proof that gender or relationship status is related with addiction.

**Keywords:** social media addiction, multiple linear regression model, collinearity.

## 1. Introduction

Social media addiction (SMA) refers to the behavior of overusing and excessively depending on social media with an uncontrollable desire to scroll through social platforms for hours. According to statistics, more than 84% of students spend at least three hours per day on social media and around 68% of college students spend more than six hours [1]. These data raise the concerns and the number of research on social media overuse significantly increased. Since 2014, WHO has conducted several meetings about the influences on people's mental health brought by social media, as they deemed that the excessive usage has already put many people's health in great danger [2].

Recent studies mainly explores the consequences of social media addiction (SMA), and finds out a significant influence on mental health and academic quality. While some young students claimed that social media could ease their loneliness, as they find connection in other peoples' comments and likes, the research show that the overuse of social media tend to create more sense of isolation. Even worse, it is the major reason leading to the increasing feeling of depression, anxiety, and stress, accompanying with weakening attention spans, poor academic performance, and reduced sleep quality [3, 4]. Similar results could be found in Aslan and Polat's research [5]. They focused on the effects of SMA on students' daily life and health by using independent t-test, one-way ANOVA, correlation and multiple linear regression methods. Their study claimed that the major reason of SMA was usage hours and frequency. Students who spent more than seven hours or checked social media over fifteen times per day reflected higher score of SMA and low sense of life satisfaction. The sense of depression or loneliness could also impede their success in academic field.

However, the current studies tend to share similarities in that they are long-term research with hundreds of participants from one specific country or a particular university major. While providing a thorough analysis of specific populations, these studies often lack diversity in participants. The aim of this study is to explore what are the factors of students' SMA and whether addiction leads to fall in their academic performance, mental health and sleep quality.

## 2. Methods

### 2.1. Data Source

The datasets used in this study are available on the data website Kaggle, collected in 2025, reflecting the most recent trends in students' digital behaviors [6]. It collects students' social media usage patterns and contains 705 participants with 11 variables, namely Age, Gender, Academic Level (AL), Country, Average Daily Usage Hours (ADUH), Most Used Platforms (MUP), Sleep Hours Per Night (SHPN), Relationship Status (RS) and Conflicts over Social Media (COSM), Affects Academic Performance (AAP) and Mental Health Score (MHS).

### 2.2. Variable Description

In total, 100 students from 705 participants were selected for this paper. They ranged from 16 to 25 years old and were from three different academic levels: high school, undergraduate, or graduate programs. Among the three levels, 4% is from high school, 50% is in university and 46% is graduate students. Male and female participants each comprise 50% of the sample. There are eleven variables, in which eight represent possible factors of SMA. It looks deep into age, gender, country, the length of social media usage, the most preferred platform, and relationship status. The dependent variable is participants' addiction level to social media, where the addiction score ranks from one (least addicted) to ten (very addicted) based on the Bergen Social Media Addiction Scale. According to the data set, 469 participants ranked their addiction score over 5, among which 199 scored addiction level 8 or 9. Second, the outcomes of SMA are also covered in this study from three aspects: academic performance, MHS, and SHPN. Mental health is self-evaluated, with participants rating their mental health quality on a scale from one (poor) to ten (excellent). Whether academic performance is influenced is also self-evaluated. Participants could simply choose between Yes and No. SHPN collects information about their average nightly sleep duration in hours.

### 2.3. Method Introduction

In this paper, the multiple linear regression model is applied to analyze the datasets. The model performs as

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_{12} X_{12} + \epsilon \quad (1)$$

It aims at exploring the linear correlation between predictor variables  $X$  and response variable  $Y$  and evaluates whether and how  $X$  has influence on  $Y$ . This model is suitable for the data analysis involving multiple independent variables. In this paper,  $Y$ , the addicted score, is a continuous variable, ranging from one to ten. To explore whether each independent variable would significantly affect the dependent variable, the statistical significance is important.

The regression model helps to determine whether the variables have causation. During the analysis, the probability of collinearity is also critical to be considered. The problem of collinearity was assessed through Variance Inflation Factors (VIF). If  $VIF > 5$ , it means that collinearity exists. In addition, if a null value is observed in VIF value or the VIF value is too big, it indicates a collinearity issue, and they would be removed for a reanalysis.

### 2.4. Data Processing

This study has two parts. One is exploring what truly leads to SMA, the other is finding out whether SMA would influence students' daily life or health. Thus, in the first part, the multiple linear regression model is applied to analyze the influence from variables, Age, Gender, AL, Country, ADUH, MUP and RS on AS. In the second part, whether SMA makes detrimental influences on students' sleep hours, mental health and academic performance would be analyzed using linear regression model.

### 3. Results and Discussion

#### 3.1. Data Distribution

Based on the multiple linear regression model, the results are shown in Table 1. As there is no outstanding VIF value in this analysis, the results are highly reliable. As this data set passes F test with  $F=241.846$  and  $p=0.000 < 0.05$ , it represents a strong statistical significance. From the results, it is easy to find that there are four variables, respectively Age, Country, AL, ADUH, which are strongly related with AS.

**Table 1.** Multiple linear regression model results

	USC		SC	t	p	Collinearity diagnosis	
	B	SE	Beta			VIF	Tolerance
Constant	5.955	0.907	-	6.564	0.000**	-	-
Age	-0.203	0.037	-0.179	-5.446	0.000**	2.570	0.389
Gender	0.075	0.087	0.024	0.865	0.387	1.808	0.553
Academic Level (AL)	-0.197	0.061	-0.122	-3.216	0.001**	3.430	0.292
Country	0.003	0.001	0.055	2.568	0.010*	1.096	0.913
Avg Daily Usage Hours (ADUH)	1.028	0.028	0.814	36.826	0.000**	1.169	0.856
Most Used Platform (MUP)	-0.003	0.010	-0.006	-0.295	0.768	1.123	0.890
Relationship Status	-0.102	0.056	-0.038	-1.817	0.070	1.027	0.973
R <sup>2</sup>	0.708						
Adjusted R <sup>2</sup>	0.705						
F	F (7,697) =241.846, p=0.000						
D-W value	1.902						

Note: dependent variable = Addicted Score

\*  $p < 0.05$  \*\*  $p < 0.01$

#### 3.2. Discussions

First, the variable Age has  $t=-5.446$  and  $p=0.000$ , meaning that it has a negative relationship with AS. Hence, when students' age grows, their addicted score would decrease. In Karayigit's research, age is an important factor of SMA that students ranging from 25 to 29 are less likely to experience SMA than younger students between 18 to 25 [7]. Second, ADUH showing strong casual relationship with AS. It proves and remains consistent with previous studies that students spending longer time on social media are more likely to be addicted to it. Similarly, Beeres et. al's 2 years' study focusing on Grade eight students also states that it was more likely for students who used social media with longer time or higher frequency to have social media addiction [8]. In addition, variables like MUP and Relationship Status do not have impact on addiction.

The second variable Gender does not show an outstanding relativity with AS. According to previous investigations, even though females prefer social media more than males, there is no evidence that females are more easily to be addicted to social media [9]. In Dumford et al.'s study, they found that students did not share a standard of frequency of using social media and males were less aware of their peers' usage patterns. The lack of realistic understanding may lead to a longer usage hours, as students may want to have the same usage pattern with others [10].

Third, AL is negatively related with AS, as there is a negative t value. It supports the conclusion of how age influences addicted score that high school students are more to get addicted, because they are more immature and vulnerable compared to older students. Apart from the causes of SMA, what are its effects is also important. Thus, Table 2, 3 and 4 present the outcomes of how SMA exert impact on students' mental health, sleep hours and academic performance. First, among 705 participants, 453 of them reported the decrease in academic performance. Showing t value of 45.929 and p value of 0.000, Table 2 suggests that addicted score has effects on academic performance.

**Table 2.** Affects Academic Performance

	USC		SC	t	p	Collinearity diagnosis	
	B	SE	Beta			VIF	Tolerance
Constant	-0.042	0.038	-	-1.110	0.267	-	-
AS	0.262	0.006	0.866	45.929	0.000**	1.000	1.000
R <sup>2</sup>	0.750						
Adjusted R <sup>2</sup>	0.750						
F	F (1703) =2109.457, p=0.000						
D-W value	2.374						

Note: dependent variable =Affects Academic Performance

\* p<0.05 \*\* p<0.01

According to Table 2, the R-squared value of the model is 0.750 so that 75% of the variation in students’ academic performance would be resulted by addicted level. Kolhar reports that more than half of participants are addicted to social media and 52% of them report that SMA distracts them from concentrating on study [11]. Even worse, many students find contents on social media more compelling than academic work. Thus, the excessive use of social media lowers their interests on studies, leading to a low quality of academic work and decline in exam grades [12]. Other outcomes like weakening attention span or less engagement in class are also observed.

**Table 3.** Sleep Hours Per Night

	USC		SC	t	p	Collinearity diagnosis	
	B	SE	Beta			VIF	Tolerance
Constant	10.364	0.114	-	90.632	0.000**	-	-
AS	-0.543	0.017	-0.765	-31.480	0.000**	1.000	1.000
R <sup>2</sup>	0.585						
Adjusted R <sup>2</sup>	0.584						
F	F (1703) =991.007, p=0.000						
D-W value	1.686						

Note: dependent variable =SHPN

\* p<0.05 \*\* p<0.01

In Table 3, the regression coefficient value for AS is t=-31.480 and p=0.000<0.01, so it has a significant negative impact on students’ sleep hours that the higher the addiction level is, the shorter the sleep hours would be.

**Table 4.** Mental Health Score

	USC		SC	t	p	Collinearity diagnosis	
	B	SE	Beta			VIF	Tolerance
Constant	10.462	0.057	-	183.833	0.000**	-	-
AS	-0.658	0.009	-0.945	-76.645	0.000**	1.000	1.000
R <sup>2</sup>	0.893						
Adjusted R <sup>2</sup>	0.893						
F	F (1703) =5874.518, p=0.000						
D-W value	2.141						

Note: dependent variable = MHS

\* p<0.05 \*\* p<0.01

As p<0.01 and t=-76.645, Table 4 presents that the extent of SMA exert strong negative impact on students’ mental health. As R-squared value equals 0.893, it is easy to conclude that 89% of mental health issues may be caused by SMA. There are several studies supporting that SMA affects mental health. Hamad et al. have indicated that students with higher frequency of social media use would be more likely to have mental illness [13].

There are also some limitations of the study. First, the sample may be not large enough compared to previous studies with over 1000 participants. Second, in this study, country turns out to be a relative factor of SMA. However, in this data set, most students are from India or the USA. Even students with other nationalities are involved, the richness of the data set in Country is not enough. Thus, whether there is a direct difference among students from different countries requires further investigation. Third, even though addicted score is found to be a determinant factor of mental health issues, another kinds of data collecting method are necessary. In this study, mental health scores are collected through self-report questionnaires. However, as students are not professional doctors, they may have wrong evaluations about themselves. Thus, if the scores are collected under professionals' guidance, the reliability of the data would be stronger.

#### 4. Conclusion

In conclusion, by analyzing 705 students' information from twelve perspectives, this study explores what contribute to SMA and whether SMA influences students' daily life. Among seven possible factors, Age, AL, Country and ADUH play the most important role of students' addiction. Students with younger age or in a lower educational level would be more likely to be addicted to social media, as they are more susceptible. Besides, spending longer time in social media increases the risk of SMA. Unfortunately, the addiction has serious detrimental impacts on students' academic performance, sleep quality and mental health. However, this study does not see direct relation between gender and SMA, even though maybe women prefer using social media more. Hence, controlling the frequency and hours of using social media is critical to students, which also could help them maintain positive mental health and adequate sleep hours.

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