Impact of Social Media on Mental Health & Academic Life- A case study on Gopalganj Science & Technology University Students

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Abstract: This study investigates how social media usage influences the mental well-being and academic performance of students. Using a structured questionnaire administered to 227 students from various academic levels, data were analyzed through correlation, regression, and t-tests. Results revealed that excessive use of social media (10–13 hours/day) significantly increases smartphone addiction and negatively affects academic results (CGPA), while moderate use (4–7 hours/day) may support academic engagement. Prolonged screen time also correlates moderately with anxiety and emotional distress. The study highlights the dual nature of social media—beneficial when used moderately but detrimental when overused—and emphasizes the need for digital well-being programs in universities to promote responsible online behavior.

Introduction: In the digital era, social media has become inseparable from students' everyday lives. Platforms such as Facebook, Instagram, TikTok, and YouTube have transformed how students communicate, learn, and build communities. For many, social media serves as a primary source of information, connection, and even emotional support. Yet, this growing digital engagement has also sparked concern about its consequences for mental health and academic performance.Students now face a paradox: while social media enhances learning opportunities, peer collaboration, and access to academic resources, excessive use often leads to distraction, anxiety, procrastination, and declining academic motivation. The constant flow of notifications and the fear of missing out (FOMO) can disrupt concentration and sleep patterns, ultimately affecting cognitive performance and well-being.Mental health issues linked to heavy social media use — including depression, stress, and low self-esteem — have become a pressing concern. Constant exposure to idealized online lives fosters social comparison, leading many students to experience feelings of inadequacy and emotional fatigue. At the same time, smartphones have become the main medium through which this engagement occurs, making them both indispensable and addictive. The **Smartphone Addiction Scale (SAS)** offers a lens to measure this dependency, highlighting how frequent checking and compulsive scrolling can erode attention and self-control. However, the impact of social media is not entirely negative. When used mindfully, it can provide emotional connection, promote awareness of mental health resources, and foster academic collaboration. The challenge lies in maintaining a healthy balance — using social media as a tool for empowerment rather than distraction.

This research therefore seeks to explore the dual nature of social media's impact on students' mental health and academic life. Specifically, it examines how the duration and purpose of social media use influence psychological well-being, smartphone dependency, and academic outcomes. By analyzing the behavioral patterns of university students, this study aims to identify both the

risks and the opportunities within digital engagement, offering insights that can guide healthier and more productive online habits among students.

Objectives:

1. To analyze the positive and negative effects of social media on mental health.
2. To assess the relationship between social media use and academic performance.
3. To propose strategies to reduce its negative impact while enhancing educational benefits.

Methodology:

- Sample**:** 227 students from Gopalganj Science and Technology University and nearby institutions.
- Sampling**:** Stratified random sampling.
- Data Tools: Structured questionnaire; data analyzed using SPSS v27.
- Techniques: Descriptive statistics, correlation, regression, and t-tests.

Result Analysis

Smartphone Addiction Scale (SAS)

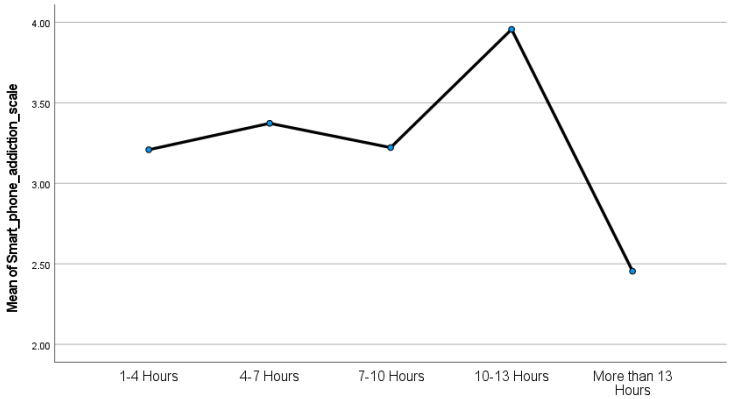
Table 1: Mean, Standard Deviation, and F-value for Smart-phone Addiction Scale (SAS)

Variables	*Mean*	*Std. Deviation*	*F(4,227)*	η^2	*Post-hoc Comparison*
1-4 Hours	*3.2089*	*1.17023*			*1<2>3<4>5*
4-7 Hours	*3.3728*	*0.99988*			*2>1<3<4>5*
7-10 Hours	*3.2222*	*1.02415*	*2.013****	*0.035*	*3>1<2<4>5*
10-13 Hours	*3.9564*	*1.26079*			*4>1<2>3>5*
More than 13 Hours	*2.4545*	*0.68568*			*5<1<2>3<4*

****p<0.001*

The table shows descriptive statistics for different groups of time spending on social media, including various sides like mean, standard deviation, and statistical scores which summarize the distribution and variability of smartphone addiction scale scores. One way ANOVA was conducted to evaluate the effect of spending time on social media and smart phone addiction scale, among those groups which says a little statistically significant result, $F(4,227)=2.013$, $\eta^2= 0.035$. It highlights key trends, such as the highest mean score in the 10-13 hours group (3.956), saying greater smart phone addiction scale impact in this period, while the lowest mean score (2.45) in the more than 13 hours group indicates potential challenges in getting a standard smart phone addiction scale. Additionally, shortly using social media of (4-7 hours) show high satisfaction with relatively low variability, whereas the 10-13 hours group exhibits the highest variability (SD =1.26), reflecting diverse academic experiences over time. Pairwise comparisons are indicated by 1>2>3>4, that shows the strong to strongest relationship among the variables.

Smart phone Addiction Scale (SAS) starts high (~3.208) in the first group of time spending (1-4 hours) on social media, increases to ~3.37 by (4-7 hours), and reaches a low of ~3.22 at 7-10 hours. It then peaks at ~3.95 during 10-13 hours of using mobile phone, before heavily decreasing to ~2.45 at using mobile phone at more than 13 hours in a day. The graph illustrates a trend of initially high materialism, a decline in smartphone addiction, a resurgence in slightly addiction, and a slight easing in long-term addiction.



Mean plot of SAS and spending time on social media.

Table 2: Coefficients of Smart-phone Addiction Scale (SAS)

Coefficients					
	Unstandardized Coefficients		***Standardized Coefficients***	***t***	***Sig.***
	B	***Std. Error***	***Beta***		
(Constant)	*3.104*	*0.164*		*18.955*	*<.001*
Spend time on social platform	*0.115*	*0.078*	*0.098*	*1.476*	*0.141*

This table shows how spending time on social media scores predict Smart phone Addiction Scale (SAS) scores. Spending time on social media is a statistically significant predictor of SAS (p=<.001). The unstandardized coefficient for spending time on social media is 0.115, meaning for every one-unit increase in spending time on social media, SAS is predicted to increase by 0.115. The standardized coefficient (Beta), which allows for comparison to other predictors if there were any, is .098. The intercept (constant) is 0.164, representing the predicted SAS when spending time on social media is zero.

Table 3: ANOVA table of Smart-phone Addiction Scale.

ANOVA					
	Sum of Squares	***df***	***Mean Square***	***F***	***Sig.***
Regression	*2.639*	*1*	*2.639*	*2.179*	*.141*
Residual	*272.546*	*225*	*1.211*		
Total	*275.186*	*226*			

The ANOVA results show that spending time on social media has a significant impact on smart phone addiction scale (SAS), with a very low probability that this result is due to chance ($p < .001$). The low F-value (2.17) suggests that spending time on social media plays a slightly meaningful

role in explaining variations in smart phone addiction scale. However, while the model accounts for some of the differences a large portion of smart phone addiction remains unexplained (272.546 residual sum of squares), meaning other factors also contribute. In simple terms, spending time of social media matters in smart phone addiction, but it's not the only thing that affects student's academic life and mental health.

Table 4: R-square table of Smartphone Addiction Scale.

Model Summary			
R	***R Square***	***Adjusted R Square***	***Std. Error of the Estimate***
0.098	*0.010*	*.005*	*1.10060*

The model summary indicates that spending time on social media explains 1% of the variance in smart phone addiction ($R^2 = 0.01$), suggesting a strong to moderate relationship. The adjusted R^2 (0.005) is much higher, meaning the model retains its explanatory power even after accounting for potential biases. The correlation coefficient (R = 0.098) shows a positive but modest relationship between spending time on social median and smart phone addiction scale (SAS). However, the standard error of 1.1006 suggests substantial variability in smart phone addiction that is not explained by spending time on social media alone, reinforcing that other factors play a significant role in relationship outcomes.

Effect on Mental Health.

Table 5: Mean, Standard Deviation, and F-value for Mental Health Scale (MHS).

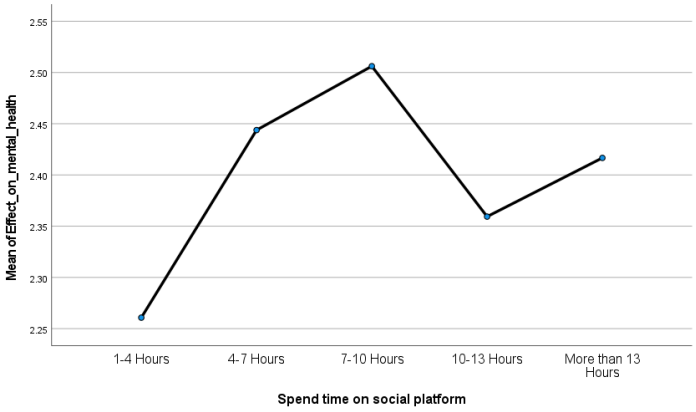
Variables	***Mean***	***Std. Deviation***	***F(4,227)***	***η^2***	***Post-hoc Comparison***
1-4 Hours	*2.2608*	*0.56789*			*1<2<3>4<5*
4-7 Hours	*2.4438*	*0.49024*			*2>1<3>4<5*
7-10 Hours	*2.5062*	*0.29861*	*1.99****	*0.0347*	*3>1<2>4<5*
10-13 Hours	*2.3594*	*0.58271*			*4>1<2<3>5*
More than 13 Hours	*2.4167*	*0.35355*			*5>1<2<3>4*

******p<.001***

The table shows descriptive statistics for different groups of time spending on social media, including various sides like mean, standard deviation, and statistical scores which summarize the distribution and variability of effect on mental health scores of it. One way ANOVA was conducted to evaluate the effect of spending time on social media and effect on mental health scale, among those groups which says a little statistically significant result, $F(4,227)=1.99$, $\eta 2= 0.0347$. It highlights key trends, such as the highest mean score in the 7-10 hours group (2.506), saying

greater effect on mental health scale impact in this period, while the lowest mean score (2.26) in the 1-4 hours group indicates moderately lower effect on mental health which is good for human mind. Additionally, shortly using social media of (7-10 hours) show high satisfaction with relatively low variability, whereas the 10-13 hours group exhibits the highest variability (SD =0.582), reflecting diverse academic experiences over time. Pairwise comparisons are indicated by 1>2>3>4, that shows the strong to strongest relationship among the variables.

Effect on mental health graph starts low (~2.26) in the first group of time spending (1-4 hours) on social media, increases to ~2.44 by (4-7 hours), and reaches the highest peak of the graph ~2.50 at 7-10 hours. It then came down at ~2.35 during 10-13 hours of using mobile phone, before slightly increasing to ~2.41 at using mobile phone at more than 13 hours in a day. The graph illustrates a trend of initially high materialism, an effect on mental health of spending time on social media and decline in smartphone addiction, a resurgence in slightly addiction, and a slight easing in long-term addiction.



Effect on Mental Health Vs Spend time on social platform.

Table 6: Coefficients *table for the Effect on Mental Health.*

Coefficients

	Unstandardized Coefficients		***Standardized Coefficients***	***t***	***Sig.***
	B	***Std. Error***	***Beta***		
(Constant)	*2.018*	*0.333*		*6.053*	*<.001*
Effect on mental health	*0.550*	*0.137*	*0.258*	*4.001*	*<.001*

This table shows how spending time on social media scores predict effect on mental health Scale scores. Spending time on social media is a statistically significant predictor of effect on mental health (p=<.001). The unstandardized coefficient for spending time on social media is 0.55, meaning for every one-unit increase in unit of spending time on social media, effect on mental health is predicted to increase by 0.115. The standardized coefficient (Beta), which allows for comparison to other predictors if there were any, is 0.258. The intercept (constant) is 2.018, representing the predicted SAS when spending time on social media is zero.

Table 7: ANOVA table for the effect on mental health

ANOVA					
	Sum of Squares	***df***	***Mean Square***	***F***	***Sig.***
Regression	*18.279*	*1*	*18.279*	*16.009*	*<0.001*
Residual	*256.906*	*225*	*1.142*		
Total	*275.186*	*226*			

The ANOVA results show that spending time on social media has a significant impact on human mental health, with a very low probability that this result is due to chance ($p < .001$). The F-value (16.17) suggests that spending time on social media plays a slightly meaningful role in effecting human mental health. However, while the model accounts for some of the differences a large portion of effecting mental health remains unexplained (256.906 residual sum of squares), meaning other factors also contribute. In simple terms, spending time of social media matters in effecting human mental health, but it's not the only thing that affects student's academic life and mental health.

Table 8: R-square table of the effect on Mental Health

Model Summary			
R	***R Square***	***Adjusted R Square***	***Std. Error of the Estimate***
0.258	*0.066*	*0.062*	*1.06855*

The model summary indicates that spending time on social media explains 6% of the variance in effect on mental health ($R^2 = 0.066$), suggesting a strong to moderate relationship. The adjusted R^2 (0.062) is much higher, meaning the model retains its explanatory power even after accounting for potential biases. The correlation coefficient ($R = 0.258$) shows a positive but modest relationship between spending time on social media and its effect on mental health. However, the standard error of 1.06 suggests substantial variability in mental health effect, that is not explained by spending time on social media alone, reinforcing that other factors play a significant role in relationship outcomes.

Academic Result (CGPA)

Table 9: Mean, Standard Deviation, and F-value for Academic result (CGPA)

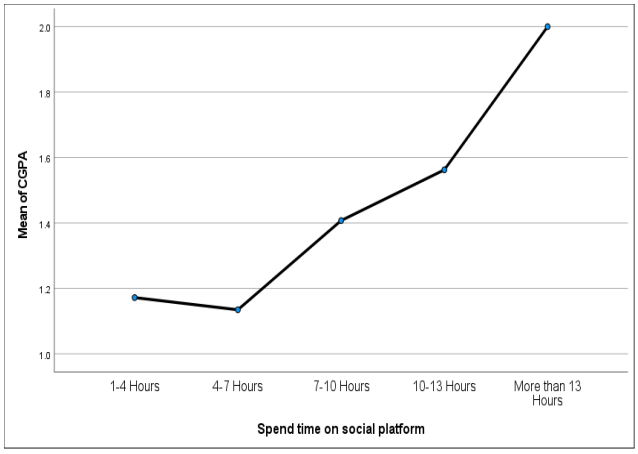
Variables	***Mean***	***Std. Deviation***	***F(4, 227)***	η^2	***Post-hoc Comparison***
1-4 Hours	*1.17*	*0.379*			*1>2<3<4<5*
4-7 Hours	*1.13*	*0.375*			*2<1<3<4<5*
7-10 Hours	*1.41*	*0.694*	*5.657****	*0.0924*	*3>1>2<4<5*
10-13 Hours	*1.56*	*0.727*			*4>1>2<3<5*

More than 13 Hours	*2.00*	*1.414*	*5>1>2<3<4*

****p<.001*

This table is a summary of descriptive statistics for Academic result across different groups of spending time on social media, summarizing the distribution and variability of scores. One way ANOVA was conducted to evaluate the effects between CGPA and time duration of using social media among different time groups of students and it shows moderately significant relationship with $F(4,227)=5.657$, $p<.001$, $\eta 2 =0.0924$. As the mean score (2.00) is observed in the more than 13 hours group, suggesting that students in this phase may experience the strongest effect on their academic carrier. With relatively lower variability in the 4-7 hours group (SD = 0.375) its suggesting the least impact along lowest mean score (1.13) indicating a potential dip in CGPA during this period. Long-term of spending time on social media (10-13 hours) show moderate levels (Mean = 1.56) but with the variability (SD = 0.727), reflecting a wider range of experiences. Pairwise comparison are indicated by 1>2>3>4, with 1 representing little effect and 4 representing strong relationship.

The graph highlights a clear negative impact of excessive social media use on academic performance. Students who spend just 1–4 hours on social media tend to achieve the best results (first division). However, as screen time increases, CGPA values rise, indicating poorer performance. Those spending more than 13 hours on social platforms show the lowest academic outcomes (third division). This suggests that excessive social media use may be disrupting study time, reducing concentration, and negatively affecting academic success.



Mean plot of CGPA vs spending time on social media

Table 10: Coefficient table for CGPA.

Coefficients					
	Unstandardized Coefficients		***Standardized Coefficients***	***t***	***Sig.***
	B	***Std. Error***	***Beta***		
(Constant)	*0.982*	*0.070*		*14.033*	*<.001*
Spend time on social platform	*0.127*	*0.033*	*0.245*	*3.797*	*<.001*

The results clearly show that spending more time on social media is linked to poorer academic performance. For every extra hour spent on social media, students' CGPA shifts lower by about 0.127 points, pushing them closer to the second division. The effect is quite noticeable (Beta = 0.245), and the statistical significance ($p < .001$) confirms that this isn't just by chance. In simple

terms, the more time students spend scrolling, the more their grades tend to suffer. This highlights the importance of finding a balance between social media use and studies.

Table 11: AANOVA tale of CGPA

ANOVA					
	Sum of Squares	***df***	***Mean Square***	***F***	***Sig.***
Regression	*3.190*	*1*	*3.190*	*14.414*	*<.001*
Residual	*49.797*	*225*	*0.221*		
Total	*52.987*	*226*			

This table tells us whether spending time on social media has a meaningful impact on CGPA. The F-value of 14.414 and the p-value of $p< 0.001$ suggest that the relationship is statistically significant. In simple terms, the amount of time students spend on social media does influence their academic performance, but there are many other factors at play. The numbers show that while social media usage does contribute to changes in CGPA, most of the variation is due to other reasons

Table 12: R-square table for CGPA.

Model Summary			
R	***R Square***	***Adjusted R Square***	***Std. Error of the Estimate***
0.245	*0.060*	*0.056*	*0.470*

This part of the analysis tells us how strong the connection is between social media usage and CGPA. The R value (0.245) shows a weak link between the two, meaning that social media time is not a major factor in predicting academic performance. The R-squared value (0.060) reveals that only 6% of CGPA changes can be explained by time spent on social media, while 94% is influenced by other things like study habits, family background, or personal motivation. The standard error of 0.470 suggests some level of prediction error, reinforcing the idea that social media isn't the sole determinant of academic success.

Table 13: Correlation table for the Smartphone Addiction Scale (SAS), Mental Health Scale (MHS), CGPA and Spending Time on Social Media.

Scale	*Smartphone Addiction Scale (SAS)*	*Mental Health Effect Scale (MHES)*	*CGPA*	*Spend time on Social media*
Smartphone Addiction Scale (SAS)	*1*			
Mental Health Scale (MHS)	*0.258*	*1*		
CGPA	*-0.016*	*-0.099*	*1*	
Spend time on Social media	*0.098*	*0.126*	*0.245*	*1*

The table presents correlations between smartphone addiction, effect on mental health, CGPA, and time spent on social media. A weak positive correlation (0.258) between smartphone addiction and mental health suggests that higher addiction may slightly worsen mental well-being. Similarly, effect on mental health and CGPA show a weak negative correlation (-0.099), implying that poorer mental health might be linked to lower academic performance. Interestingly, social media usage has a small positive correlation (0.245) with CGPA, but since higher CGPA values indicate poorer academic results in this grading system, it suggests that increased social media use is associated with lower academic performance. Additionally, social media usage and effect on mental health (0.126) have a weak positive link, indicating a minor connection between them. Overall, while none of these relationships are particularly strong, the trends suggest that excessive smartphone and social media use may slightly contribute to academic and mental health challenges, though other factors are likely at play.

Table 14: Table 14: Independent sample t-test for the significance of the difference between female and male in Smartphone Addiction Scale (SAS), Mental Health Effect Scale, CGPA and Spending time on social Media.

Variables	*Female (n=111)*		*Male (n=116)*		*T*
	Mean	*S.D*	*Mean*	*S.D*	
Spend time on social platform	*1.88*	*0.882*	*1.87*	*0.992*	*0.222*
CGPA	*1.14*	*0.369*	*1.30*	*0.563*	*<0.001***
Smartphone Addiction Scale (SAS)	*3.4791*	*1.0123*	*3.1693*	*1.1684*	*0.028***
Mental Health Scale (MHS)	*2.3866*	*0.4591*	*2.3542*	*0.5688*	*0.085*

***Correlation is significant at the 0.05 level (2 tailed)*

This correlation table sheds light on the complex relationships between smartphone addiction, mental health, academic performance, and social media usage. The moderate positive correlation (0.258) between smartphone addiction and mental health suggests that excessive phone use may contribute to mental health struggles, reinforcing concerns about the psychological impact of screen time. Interestingly, the relationship between CGPA and mental health is weakly negative (-0.099), implying that while mental health challenges may have some effect on academic performance, other factors such as study habits and motivation likely play a bigger role. One surprising finding is the weak yet positive correlation (0.245) between CGPA and time spent on social media, challenging the widespread assumption that social media use hinders academic success. This could mean that students utilize social media for academic collaboration, learning resources, or even stress relief, which might indirectly support better grades. Additionally, the weak positive correlation (0.126) between social media use and mental health suggests that its impact on well-being varies, possibly depending on how it's used—whether as a source of support and connection or a cause of stress and comparison. Overall, these findings highlight that smartphone addiction could be a red flag for mental health risks, but its influence on academic performance appears minimal. Moreover, social media isn't necessarily detrimental to students' grades and may even offer unexpected benefits. Moving forward, it would be valuable to explore other factors—such as self-regulation, sleep patterns, and social support—that could shape these dynamics in a more nuanced way.

Discussion and Conclusion

The findings reveal a significant connection between social media usage, mental health, and academic performance. Students who spent between 10–13 hours daily on social media exhibited the highest levels of smartphone addiction (Mean = 3.95), while mental health challenges peaked among those using it for 7–10 hours per day (Mean = 2.50). Academic performance showed a clear decline among students spending more than 13 hours online, with their CGPA averaging 2.00.

Statistical analyses confirmed these trends: time spent on social media significantly predicted both mental health deterioration and academic underperformance ($p < 0.001$). However, the relationship strength was modest ($R^2 = 0.060$), indicating that other factors—such as personal motivation, study habits, and time management—also shape outcomes. Interestingly, while moderate social media use (4–7 hours) appeared relatively harmless, overuse consistently led to distraction, emotional strain, and academic decline.

Gender-based differences were observed: female students displayed slightly higher smartphone addiction levels (Mean = 3.48) than males (Mean = 3.16), though no significant disparity was found in mental health outcomes.

In conclusion, this study underscores social media's double-edged influence—it can enhance learning and connection when used moderately but contributes to addiction, anxiety, and academic setbacks when overused. Universities should foster digital literacy, mindful usage, and balanced online engagement to help students harness social media's benefits while mitigating its psychological and academic risks.

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