Research on Social Media's Impact on Adolescent Mental Health

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Abstract:

The research looked into how teenagers used of social media and how it influenced their mental health. The research examined the ways in which teenagers engaged with social media and the effects it had on their psychological well-being. By analyzing social media interaction data from 103 individuals between the ages of 21 and 30, it was discovered that the quantity of likes they received daily had a substantial effect on the core emotions of these young adults. The results, which were obtained using a logistic regression model, demonstrated that the teens' negative emotions were more evident the more time they spent on social media and the more likes they received. In addition, studies have found a link between social media use and depression and anxiety in teens. In addition, studies have linked social media use by young people this decade to worry and sadness. Despite the small sample size, these findings are important for understanding the impact of social media on young people's mental health. They advise parents, educators and social media companies to focus on the social media use patterns of young users and take steps to reduce potential risks to their wellbeing. These findings have raised awareness of the impact of social media conversations on young people's emotional wellbeing and have provided the basis for the development of effective mental health intervention techniques.

Keywords: Social media; teenager; logistic regression.

1. Introduction

In today's world, where almost everyone has a cell phone, social media has become popular to facilitate communication. Social media has become really popular and it affects how teenagers live every day. The digital age has ushered in the integration of social media platforms such as Instagram, TikTok, Snapchat, and others providing space for adolescents to socialize, self-express, and share information.

Smith's research demonstrates that social media usage has become a main channel for adolescents to interact with society and obtain information. 83% of individuals in the UK own a smartphone, and 99% of them use it for at least 21 hours every week [1, 2].

The United States has published similar interesting data. Social media can have a negative impact on the mental health of adolescents [3]. For example, as social media became popular among American teens, their mental health began to deteriorate. Between 2008 and 2018, an 83 percent increase was observed in the number of 18 to 23-year-old experiencing a major depressive episode in the previous year.

Suicide is now the second most common causes of mortality among people aged 15 to 24 [4]. According to Ofcom, one of the leading reasons of poor mental health is an inability to limit screen time. In the United Kingdom, almost 70% of young people aged 12 to 15 have their own social media accounts, although more than one-third claim trouble limiting their screen usage [5]. At the same time, the number of suicides and general mental illnesses among youths in the UK has increased [6]. Secondly, online bullying is another essential aspect of the impact of social media on adolescent mental health. Chen's study has demonstrated that cyberbullying victims are more likely to experience psychological issues [7]. The anonymity and timeliness of social media exacerbate the problem. Therefore, studying the social media use's effects on mental health has important implications for developing effective intervention strategies and promoting the well-being of adolescents

The research focused on the effects of social media on teenagers' mental health, including emotions, self-perception, and social skills. It found that social media usage by individuals aged 21 to 30 had a notable impact on their emotional states, with the number of likes they received each day being particularly influential. In a previous study, Amber conducted an analysis of cross-sectional data from the Millennium Cohort Study in order to investigate the relationship between the amount of time spent on social media as documented in a Time Use Diary (TUD) and significant outcomes related to teenage mental health (such as self-harming behaviors in the previous year, depressive symptoms as measured by the Short Mood and Feelings Questionnaire), and self-esteem as measured by the Simple Rosenberg Scale). Jhon used "mental health" or "mental illness" and "social media" as search keywords, recent peer-reviewed publications were searched on Medline and Google Scholar and a list of references for proximate reviews and other correlative studies was searched [8]. Most of the evidence base for studying teens' usage of social media is quantitative, with significant research undertaken in Europe and aboard. While these studies help to understand screen time, qualitative evidence is very new. To better understand the relationship between social media and mental health, social science research in the topic focuses on language and experience, and young people are at the center of the study [9]. However, some existing surveys may have limitations in sample selection and neglect individual differences [10]. This work uses a mix of research method, and combined counting and describing to get a fuller picture. Investigations of a longitudinal nature are being conducted with the objective of identifying developmental shifts in social media utilization among adolescents. The studies aim to measure the prolonged influence of such patterns on the mental well-being of this demographic. Information is accumulated and subsequently evaluated through qualitative analysis.

2. Methods

2.1 Data Source

The data for this article was obtained from the Kaggle website and published by Emirhan BULUT, the founder of artificial intelligence. It collects useful information about social media usage and shows the users' main emotions after the event. These statistics are ideal for investigating the relationship between social media consumption and mental wellness.

2.2 Variable Selection

The data used in this article counted the social media usage and mental condition of 103 adolescents, including 46 males, 26 females, and 31 transgender people. The age of the respondents ranged from 21 to 30. The data contained seven variables: age, gender, platform used, daily social media usage time, number of emails per day, number of likes received per day, number of comments received per day, and number of messages sent per day. The dependent variable is the different manifestations of emotions, which are mainly six types: happiness, neutral, sadness, boredom, sadness, anger, anxiety, and emotions increase step by step from calm to tense, divided into six levels.

Table 1. Frequency distribution of dependent variables in regression analysis

Name	Options	Frequency	Percentage
	Anger	9	8.82%
	Anxiety	22	21.57%
	Boredom	16	15.69%
Dominant_Emotion	Happiness	13	12.75%
	Neutral	28	27.45%
	Sadness	14	13.73%
	Total	102	100.0

Table 1 summarizes the frequency and percentage of feelings as a subordinate variable, with neutrality being the most important. However, the sum of bad emotions like anger, anxiety, despair, and boredom is greater than the sum of happiness and neutral. This shows that the use of social media in this data set can cause negative emotions in adolescents' psychology, with a greater negative impact.

2.3 Model Introduction

This paper will use a binary logistic model setting, with the dependent variable being the respondent's emotional state, which is divided into "negative" and "positive". In this article, anger, anxiety, sadness, and boredom are classified as bad feelings, while neutrality and happiness are classified as happy feelings. Factors that affect their emotional state are X_i. The binary logistic model is as follows:

$$ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_m X_m \qquad (1)$$

Among them, the positive emotions are Y=0, and the negative emotions are Y=1.

3. Results and Discussion

3.1 Data Summary

Figure 1 illustrates how social media affects people's emotions depending on several factors in this data. It is not difficult to see that most respondents hold a neutral attitude, that is, they will neither have negative emotions nor feel particularly happy. However, the number of people with anxiety, anger, boredom, and sadness, which are negative emotions that are likely to harm people's mental health, is greater than the number of people with happiness and neutrality. This study demonstrates that teenagers' use of social media has a negative impact on their mental health.
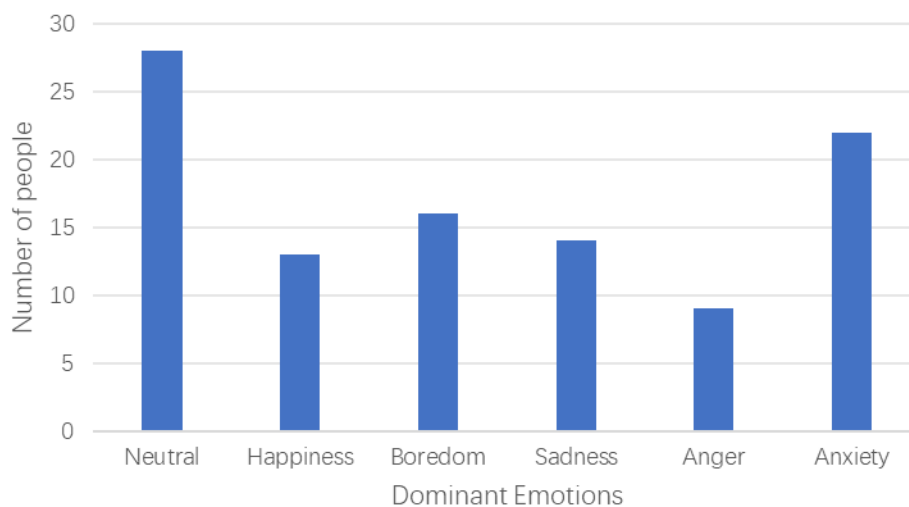

Fig. 1 Emotions arising from using social media

Fig. 2 Schematic diagram related to variables

As shown in Figure 2, the study introduced various factors that may be related to emotional influence into the model, including platform, daily usage time, comments received per day, posts per day, messages sent per day, and likes received per day. The final model formula is:

$$ln\left(\frac{p}{1-p}\right) = -5.871 + 0.266X_1 - 0.051X_2 - 0.616X_3 - \qquad (2)$$
$$0.115X_4 + 0.34X_5 + 0.219X_6$$

3.2 Model Results

From the summary analysis in Table 2, this paper can con-clude that Age, Comments Received every day, Messages Sent Per-Day have a significant positive impact on Dominant Emotion, and Daily Usage Time (minutes), and Likes Received Every Day have a significant negative impact on Dominant Emotion. However, Posts per day do not have an impact on Dominant Emotion. Adolescents' psychic health is primarily influenced by their social media usage and number of likes. This can help people clearly under-stand which aspects of using social media are likely to make people feel bad and thus affect their mental health.

Table 2. Summary of the Binary Logit Regression Analysis Results

Term	coefficient	SE	z	Wald χ2	p	OR	OR 95% CI
Age	0.266	0.084	3.185	10.143	0.001	1.305	1.108 ~ 1.537
Daily_Usage_Time (minutes)	-0.051	0.021	-2.439	5.946	0.015	0.950	0.911 ~ 0.990
Posts_Per_Day	-0.616	0.430	-1.431	2.048	0.152	0.540	0.233 ~ 1.256
Likes_Received_Per_Day	-0.115	0.049	-2.344	5.495	0.019	0.892	0.810 ~ 0.981
Comments_Received_Per_Day	0.340	0.123	2.765	7.645	0.006	1.404	1.104 ~ 1.787
Messages_Sent_Per_Day	0.219	0.092	2.376	5.645	0.018	1.245	1.039 ~ 1.492
Intercept	-5.871	2.387	-2.459	6.047	0.014	0.003	0.000 ~ 0.304
Dependent Variable = Dominant_Emotion							
McFadden R2 = 0.296							
Cox & Snell R2 = 0.329							
Nagelkerke R2 = 0.444							

Table 3 shows that the research model predicts with an overall accuracy of 80.39%, indicating good model fitting quality. The model fit is acceptable. Prediction accuracy ranges from 68.29% to 88.52% for real values of 0 and 1, respectively.

Table 3. Binary probit regression prediction accuracy summary

0		Predicted value		Prediction accuracy	Prediction Error Rate
		1			
True value	0	28	13	68.29%	31.71%
	1	7	54	88.52%	11.48%
Total				80.39%	19.61%

4. Conclusion

This study selected various data and focused on factors that may affect adolescents' mental health. The research found out that social media can sometimes make people feel bad. It can lead young people to have problems with their feelings. The amount of time they spend on social media correlates with internal feelings.

However, it is undeniable that due to the limited amount of data, the model may have errors beyond many factors, and the sample coverage does not include more variables such as gender and ethnicity. These findings may be affected by sample selection bias. However, this study still has many methods and advantages, such as the use of graphical methods to make the model presentation more intuitive. In addition, this study provides important inspiration for parents, educators, and social media platforms, that is, they need to pay attention to the habits of teenagers using social media and take measures to reduce the negative emotional impact that may be caused.

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