

Examining The Impact Of Social Media On Mental Health Among Undergraduate Students In District Peshawar

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ABSTRACT

This study investigates the impact of social media usage on the mental health of undergraduate students in District Peshawar, focusing on depression, anxiety, and stress levels. Utilizing a sample of 367 students selected through multi-stage cluster sampling, data were analyzed using descriptive statistics, correlation analysis and chi-square tests. The findings reveal that excessive social media use, particularly on platforms like Instagram and TikTok, significantly contributes to adverse mental health outcomes. Female students were found to be more vulnerable to severe depression, anxiety, and stress due to heightened engagement with visual content and social comparison. The study also highlights a significant association between frequent social media checking before bedtime and elevated levels of psychological distress. While platforms like WhatsApp showed minimal negative effects, others, such as Instagram, exacerbated mental health issues. The study concludes that unregulated social media usage poses serious risks to students' mental well-being and calls for interventions, including mindful usage practices, educational awareness, platform-level policy changes, and institutional support systems. These findings underscore the need for a balanced approach to harness the benefits of social media while mitigating its detrimental effects on mental health.

Introduction

Considering the increased popularity of social media in the contemporary world, it is not surprising that the lives of today's students have also been modified to accommodate changes in technology. Be it on Instagram, Tik Tok, or YouTube and Facebook, social media has become one of the most utilized applications by students in relating with others and obtaining learning resources and information concerning the rest of the world. Social media as an alternative solution has its advantages. This

rapid increase in the usage of social media among students has raised concern regarding the level of its implication on the mental wellbeing of the students. The existing literature provides, in increasing measure, support for the thesis that social media activities, rather than improving complicated mental health, can actually be psychopathological and dysfunctional [1]. One of the major ways in which social media has an impact on mental well-being is by way of social comparison. This is why the usage of visual apps such as Instagram and Snapchat drives people to always compare their lives with the lives of other people. Most of the time, this is due to the fact that people are judging what they see based on representations that are not real, and as such, dissatisfaction is created when one measures their situation against the ideal [2]. In a 2021 Pew Research Center report, 84% of 18-29-year-olds were on any social media platform, and many spend multiple hours per day exploring feeds, slinging takes back and forth in comment sections, and consuming media [3]. Social media is usually a source of unhealthy social comparison, especially for students who are at a developing stage in themselves as they try to build their identities. The visually-oriented and personally branding applications like Instagram and Snapchat create false expectations about beauty, success, and happiness, females are possibly more concerned with negative feedback during social comparison behaviors that are most frequent on visual domains such as Instagram and TikTok [4]. The influence of social media might be seriously

damaging to mental health, thus likely to trigger anxiety and depression and eating disorders as well [5]. On the other hand, in most studies, much attention is paid to how social media negatively affects the mental health of a student. Nevertheless, it is important to note the positive impacts that these have on students. A social networking site can be a source of online communities from which students can gather together to find mutual support as they share their experiences and relate with people who have faced related problems [6]. For example, for a group of pupils who are prone to social anxiety or who had a hard time creating social relations in the offline world, media can act as an important lifeline that can offer opportunities for communication and socially interacting that would otherwise not be possible outside of the traditional settings [7]. The relationship between social media and mental health is inconsistent, with a specific effect primarily occurring through moderating individual differences. Evidence was found about the modification in succeeding papers of social media use on mental health through gender, personality traits, and levels of socioeconomic status. Some studies have even shown that social media has worse undesirable mental health results for women, including problems like body dissatisfaction, anxiety and depression [8].

Social Media and Mental Health

As it stands, more especially among teens and young adults, there is no denying that social media has become part and parcel of everyday life. However, apart from connecting people to one another, social media sites like Facebook, Instagram, YouTube, and TikTok also help individuals to take a break from daily routines such as handling people, moving, taking and sharing pictures, meeting new people, and watching countless videos, which can only be done in today's world. In relation to the scale of the phenomenon, we can now say that in 2023, over 4.9 billion users of social

media were active users (Statista, 2023)[9]. On the one hand, these deeds, however much they make people delighted and allow people to give information in an inter-communication way amongst individuals and even socialize, possible damages to health and well-being would accrue, such as psychological diseases such as depression. But then, social media can be a non-creativity space, which is correct, but that approach has its own set of issues. More specifically, this pattern of media use assists personal functionality but undermines social interaction and commonality within people and leads to individuals' isolation (Manly, 2020)[10].

Depression

Depression is a mental illness where an individual has a low mood or loss of interest in any activity of daily living for more days than not, impairing one's functioning or causing noticeable suffering. Depression might be experienced only once, or it may arise with many episodes. Various symptoms manifest during depressive episodes. Such symptoms of depression are tiredness, lack of interest, irritability, loss of appetite, and even suicidal thoughts. The effects of depression vary from one individual to another—it may be very mild or very severe [11].

Anxiety

An anxiety disorder is a mental condition; the person feels worry, anxiety, or fear that may be strong enough to interfere with daily activities, life has recognized normal episodes of anxiety, but someone suffering from an anxiety disorder often has these episodes, which bring massive impacts on one's activities and thus limit the functionality, the signs of this anxiety disorder include increased heartbeat, hyperventilation, and so on. There is the fear of impending doom, a feeling where one cannot even control anxiety and at times even wishes that certain events or things end. Anxiety attacks may reach their peak in minutes and are quite tough to treat [11].

Stress

Stress is the feeling of tension within your mind or body; it can be caused by any situation or thought that leads to irritation, anger, or anxiety, it is pretty common to feel stressed during day-to-day life; however, one needs to understand that stress causes bodily effects instead of merely emotional or mood-related. Following are the ways in which stress symptoms present: headaches, muscle aches and pains, difficulty sleeping, etc., forgetfulness, tiredness, and lack of energy can lead to using alcohol or drugs, although it is quite common to feel stressed at any time in everyday life, mild or Situational stress is temporary. Chronic, however, lingers on for a long period of time [12].

Research Objectives

To identify the general patterns of social media usage among students, including average hours spent per day and preferred types of activities etc.

To investigate the relation between age, number of hours spent on social media and mental health score

To assess association between checking social media and mental health categories

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Literature Review

Generally, the aim of this review literature is to critically discuss the present body of research concerning the impact of social media on the mental health of students. This shall involve positive and negative mental health outcomes associated with the use of social media.

In early 2017 a study was conducted among young adults in the United States to determine if an association exists between the number of social media sites used with depression and anxiety, after conducting a research the researchers concluded participants who used seven or more social media sites reported increased instances of depression and anxiety [1]. More than 90% of students and young adults using higher education are very active social media users, mostly getting online multiple times a day [3]. A research highlighted that there was a higher usage of image-based platforms like Instagram and Tik Tok by female students, while YouTube and Twitter supported the maximum usage among male students [6]. O'Reilly et al. [7], even argued that for many young people, social media can become an important source of feeling like they belong and having a community that will minimize loneliness and isolation. Nevertheless, such benefits may go along with risks since prolonged or excessive use of social media is linked with adverse psychological results. Valkenburg et al. [8], found that visual platforms such as Instagram and TikTok are actual breeding grounds of anxieties because users engage in self-comparison and seek validation through likes and comments. This constant need for approval creates a feedback loop of anxiety, wherein the user becomes dependent on social media for their worth. In 2020, there was a study that targeted specifically young adults in Germany. The primary aim of that would identify the relationship between reasons for using social media, daily stress, depression and anxiety. And the study concluded that social interaction, self-presentation, information seeking, relaxation, entertainment, as well as other reasons were grounds for social media application [13]. A study in 2016 focused only on the relationship between engagement with Instagram and loneliness and social comparison. Though there have been numerous studies conducted previously on the relationship between social media use and loneliness, the findings are conflicting. Thus, this study specifically focused on Instagram as the only source of social media, according to Yang [14], this was a survey research of 208 undergraduate students between the ages of 18 and 25, it is concluded that browsing on Instagram is related to lesser levels of loneliness, but broadcasting, which is what influencers engage in, is related to higher levels of loneliness, it was also found that users who engaged in upward social comparison reported greater levels of loneliness. Another study in 2016 revolved around the relationship of the use of social media with loneliness through instruments like Instagram and Twitter, and the researchers assumed that image-based platforms comprise more of social presence; therefore, they appropriately fight loneliness as opposed to text-based platforms [15], and It was concluded that using more image-based platforms, such as Instagram, is associated with lower levels of loneliness. In 2017, a particular study focused specifically on the types of use for Instagram and their connection to the depressed mood of adolescents and this study was conducted to fill the gap in previous research. In this survey, after each use of Instagram, there is self-reported data collected. Participants were instructed to use Instagram at least twice a

day and to fill out the questionnaire every time they used Instagram. The findings of this study indicate that users who used Instagram for the first time during the day were more depressed than those who used it for the second time in a day [16]. A longitudinal study focused on dealing with the relationship between Twitter and depression. It was found that people who indicated low in-person social support and used Twitter had reduced symptoms of depression [17]. Research was conducted by Rosen et al. [18], and they found that individuals who expended much time on the internet and frequently covered their photos on social media experienced severe symptoms of major depression. A study by Pantic et al. [19], in Croatia established a correlation between Facebook use and depression amongst high schoolers. Furthermore, Kalpidou et al. [20] revealed that the more Facebook friends that undergraduates reported having, the worst time they had emotionally adapting to university life. According to the very same study, students who extensively utilized social media more often than less often indicated having fewer self-confidences.

Methodology

Population

The population for this study comprises students from government colleges in Peshawar offering BS degree programs, covering both male and female colleges. From male colleges we included Government College Peshawar, Government Degree College Hayatabad, Government Superior Science College Peshawar, and Government Degree College Naguman, and from female colleges we selected Government Girls Degree College Dabgari and Government Frontier College for Women. By including both male and female, and various colleges, the study provides a comprehensive results of social media's impact on students' mental health across Peshawar's government college system.

Sample

From the population of government colleges in district Peshawar, offering BS degree programs, a multistage cluster sampling technique was used. In the first stage, a few colleges were selected, including Government College Peshawar (GCP), Government Superior Science College (GSSC), and Government Degree College Hayatabad (GDC) for male students, while Government Frontier College for Women (GFCW) and Government Girls Degree College Dabgari was selected for female students. In the second stage, specific departments within these colleges were randomly chosen to represent different academic disciplines. In the third stage, only those students were selected which are above 4th semester, as these students were considered to have a higher level of maturity. This process resulted in a sample of 367 students through Cochran's formula.

Research Hypothesis

We check the following hypothesis:

- 0 H' : There is no significant association between the frequency of checking social media before going to bed and mental health categories (depression, anxiety and stress)

- 1 H' : There is significant association between the frequency of checking social media before going to bed and mental health categories (depression, anxiety and stress)

Statistical Techniques

Different statistical techniques/tools were used for the analysis of data. The data was analyzed through statistical software specifically SPSS and R. Descriptive statistics were used which includes tables, Measure of Central Tendency, Measure of Dispersion and Pie-Chart are used gender wise. Correlation matrix was also used to find the relationship among variables.

Descriptive Statistics

Descriptive statistics are used to summarize and organize the characteristics of the dataset. These statistics include measures of central tendency (mean, median, mode) to identify typical values, and measures of variability (range, variance, standard deviation) to assess data spread. Additionally, frequency distributions and measures of shape, such as skewness and kurtosis, offer insights into the data's distribution.

Correlation Matrix

A correlation matrix is a table that shows the correlation coefficients between multiple variables in a dataset, helping to identify the strength and direction of their relationships. The values range from -1 to 1, with 1 indicating a perfect positive correlation, -1 a perfect negative correlation, and 0 no linear relationship. The matrix allows us to assess how variables are related, detect patterns, and identify potential multicollinearity, which can affect further analysis. It provides a clear overview of the relationships between variables in the dataset.

Chi Square Test

The chi square test was first published by Karl Pearson in 1900. The chi square test is a statistical technique used to determine whether there is association between two categorical variables or whether the observed data significantly differ from the expected data. The Chi Square statistic is calculated as:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

O_i = Observed frequency

E_i = Expected frequency

The calculated Chi-Square value is compared to a critical value from the Chi-Square distribution table based on degree of freedom $df = (r - 1)(c - 1)$, where r denotes row and c denoted columns.

Results and Interpretations

This study was conducted to see the impact of social media on the mental health of undergraduate students in District Peshawar through a multi-stage cluster sampling. First, government colleges for males and females were selected; then, random selections of different departments were carried out in the second stage. During the

last stage, only 4th-semester and above undergraduates contributed to the data collection. Overall, the sample size obtained comprised 367 students—215 males and 152 females assuring adequate and representative coverage of the target population.

Table 1: Descriptive Statistics of Time Spent on Social Media by Gender

Spent Time On Social Media						
Gender	Minimum	Maximum	Mean	Variance	Skewness	Kurtosis
Male	1	8	3.07	2.818	1.470	1.957
Female	1	12	3.43	4.649	1.890	4.084

As is clear from Table 1, the average female usage is slightly higher than that for males. The variability for females is higher compared to that for the males. The two curves are positively skewed. Both have mainly lower usage levels with a few people who heavily use social media. The female curve is more kurtic than the male. That is, the female usage exhibits more preference for the center with more individuals at the tails. The female usage is more peaked.

Table 2: Descriptive Statistics for Depression, Anxiety and Stress Score by Gender

Depression Score						
Gender	Minimum	Maximum	Mean	Variance	Skewness	Kurtosis
Male	2	42	15.95	40.059	0.582	1.769
Female	0	38	15.66	64.028	0.298	-0.05
Anxiety Score						
Gender	Minimum	Maximum	Mean	Variance	Skewness	Kurtosis
Male	0	44	14.03	48.84	0.449	2.382
Female	0	34	14.95	71.04	0.162	-0.578
Stress Score						
Gender	Minimum	Maximum	Mean	Variance	Skewness	Kurtosis
Male	0	42	16.10	43.75	-0.64	1.957
Female	0	38	18.67	82.38	-0.124	4.084

Table 2 reveals small gender differences in means but greater variation for females. The variance values are higher for females than males, and this difference is higher for stress. The distributions are relatively symmetrical, and there is a slight skewness for the male groups. The values for kurtosis are relatively flat, but there is a high leptokurtosis for female stress, suggesting that extreme values are concentrated among female stress scores.

Table 3: Gender-Wise Frequency Distribution of Mental Health Categories

Depression Categories						
Gender	Normal	Mild	Moderate	Severe	Extremely Severe	Total
Male	30 (8.17%)	34 (9.26%)	114 (31.07%)	28 (7.63%)	9 (2.45%)	215 (58.60%)

Female	31 (8.44%)	26 (7.08%)	63 (17.17%)	18 (4.90%)	14 (3.81%)	152 (41.40%)
Total	61 (16.61%)	60 (16.34%)	177 (48.24%)	46 (12.53%)	23 (6.26%)	367 (100%)

Anxiety Categories

Gender	Normal	Mild	Moderate	Severe	Extremely Severe	Total
Male	31 (8.44%)	20 (5.45%)	67 (18.26%)	59 (16.07%)	38 (10.53%)	215 (58.60%)
Female	30 (8.17%)	9 (2.45%)	39 (10.63%)	27 (7.36%)	47 (12.81%)	152 (41.40%)
Total	61 (16.61%)	29 (7.90%)	106 (28.89%)	86 (23.43%)	85 (23.16%)	367 (100%)

Stress Categories

Gender	Normal	Mild	Moderate	Severe	Extremely Severe	Total
Male	99 (26.97%)	49 (13.35%)	50 (13.62%)	18 (4.90%)	14 (3.81%)	215 (58.60%)
Female	56 (15.26%)	17 (4.63%)	36 (9.81%)	35 (9.54%)	8 (2.18%)	152 (41.41%)
Total	155 (42.23%)	66 (17.88%)	86 (23.43%)	53 (14.44%)	22 (6.00%)	367 (100%)

Table 3 indicates clear gender differences among the subjects regarding depression, anxiety, and stress. In both males and females, moderate depression is the most common, comprising 31.07% and 17.17%, respectively. However, more females show a proportion of extremely severe depression compared to males. In anxiety, moderate and severe levels dominate overall, but extremely severe anxiety is much greater in females, whereas moderate and severe anxiety is seen more in males. Regarding stress, most males tend to fall under the normal category, while females display greater levels of mild to severe stress. Overall, categories such as moderate depression and anxiety and normal stress dominate the scores.

Figure 1 Social Media Preferences and Usage Purposes Among Female Students

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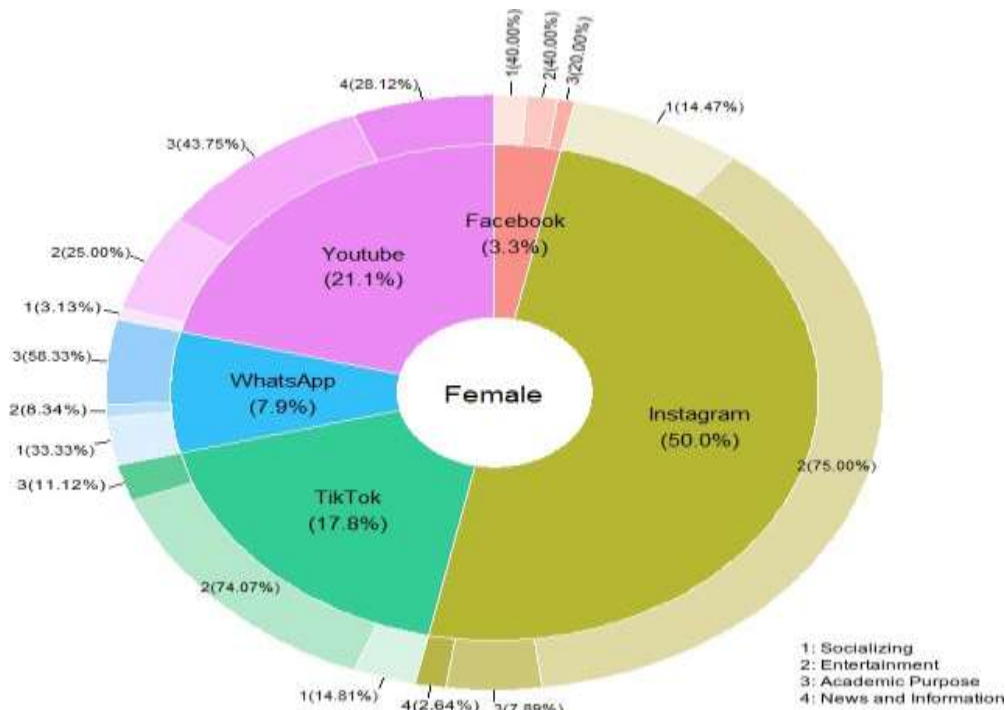
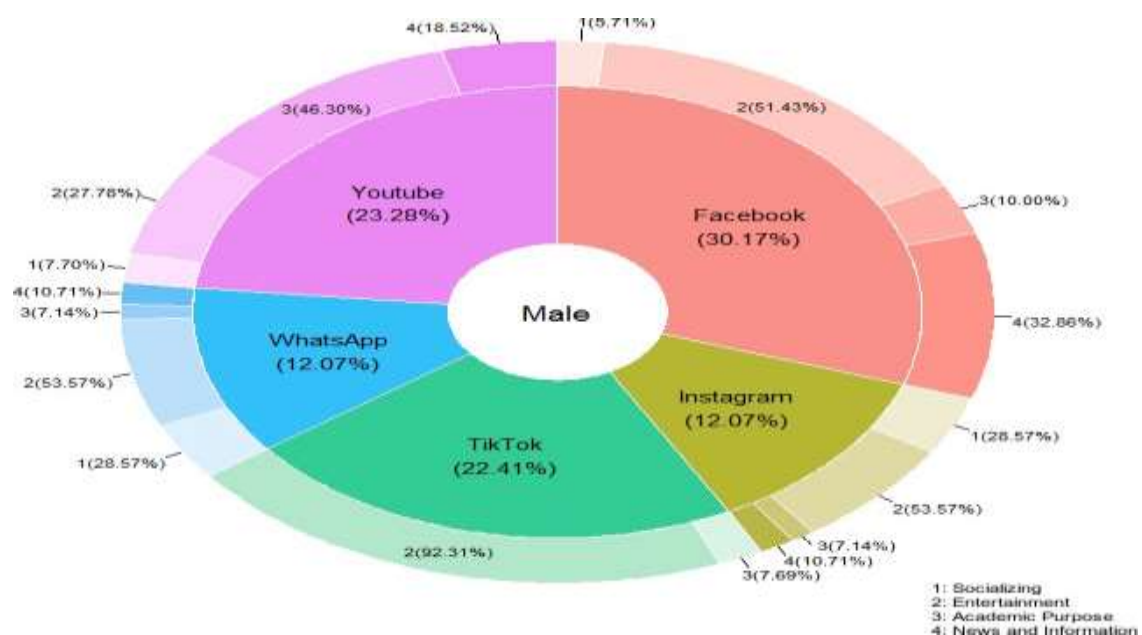


Figure 1 indicates that Instagram is the most used platform for female students (50%) since it is used for socializing and entertaining. YouTube (21.1%) is mostly used for learning and information searching. TikTok (17.8%) is also used for entertaining. WhatsApp (7.9%) is majorly used for learning and socializing. The usage of Facebook (3.3%) is minimal and for socializing and entertaining. Socializing and entertaining are the major objectives used on the platforms.

Figure 2 Social Media Preferences and Usage Purposes Among Male Students



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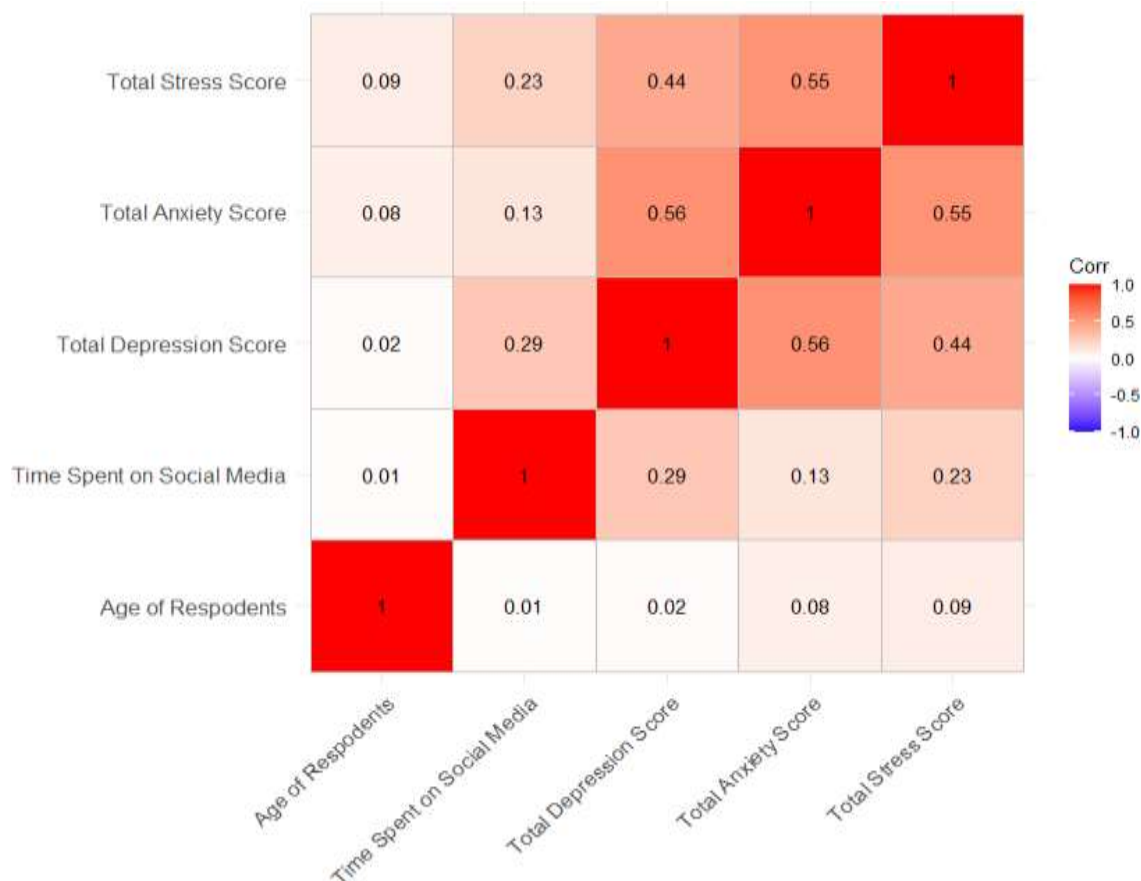
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Figure 2 shows that Facebook is the most commonly used platform in the group of male students (30.17%), primarily for entertainment. YouTube (23.28%) is primarily utilized for academic-related activities, whereas TikTok (22.41%) is almost entirely used for entertainment. WhatsApp

& Instagram (12.07% each) are primarily used for entertainment functions and lack academic utilization. In general, entertainment accounts for the major usage of social networking sites among males, in which YouTube is primarily used for academic purposes.

Figure 3: Correlation Heatmap of Age, Social Media Usage and Mental Health

The figure 3 shows the correlation between age, time spent on social media, and



psychological factors such as stress, anxiety, and depression. The diagonal values represent perfect correlations of variables with themselves (value = 1). The results indicate that age has a negligible correlation with all other variables, suggesting it does not significantly impact stress, anxiety, depression, or social media usage. Time spent on social media shows a weak positive correlation with depression (0.29), anxiety (0.13) and stress (0.23), indicating a slight link between higher social media usage and increased psychological distress. Strong positive correlations exist between total stress, anxiety, and depression scores, with values ranging from 0.44 to 0.56.

Table 7 Association between Social Media Checking Status before Going to Bed and Mental Health Categories (Depression, Anxiety and Stress)

Depression Categories							Total
Social Media Status	Checking	Normal	Mild	Moderate	Severe	Extremely Severe	
Always	25	24	74	25	15		163
Often	17	10	24	9	2		62
Sometimes	10	12	61	11	6		100
Rarely	5	9	14	1	0		29
Never	4	5	4	1	0		29
Total	61	60	177	46	23		367

$\chi^2 = 34.239$ with 16 df and (p-value = 0.005)

Anxiety Categories							Total
Social Media Status	Checking	Normal	Mild	Moderate	Severe	Extremely Severe	
Always	23	22	43	30	45		163
Often	11	2	47	18	14		62
Sometimes	14	2	29	35	20		100
Rarely	3	3	16	1	6		29
Never	10	0	1	2	0		13
Total	61	29	106	86	85		367

$\chi^2 = 71.913$ with 16 df and (p-value = 0.0005)

Stress Categories							Total
Social Media Status	Checking	Normal	Mild	Moderate	Severe	Extremely Severe	
Always	58	28	39	31	7		163
Often	28	10	17	6	1		62
Sometimes	40	22	27	10	1		100
Rarely	18	4	3	3	1		29
Never	11	2	0	0	0		13
Total	155	66	86	50	10		367

$\chi^2 = 34.239$ with 16 df and (p-value = 0.005)

The Table 7 reveals a significant association between social media checking status and mental health categories, including depression, anxiety, and stress. The chi-square test results indicate that individuals who frequently check social media, particularly those who check "always" or "often,"

are more likely to fall into higher severity categories for depression, anxiety, and stress. For instance, frequent checkers exhibit a higher prevalence of moderate to severe depression, severe to extremely severe anxiety, and moderate to severe stress. Conversely, those who rarely or never check social media tend to have better mental health, with most falling into the normal or mild categories for depression, anxiety and stress. The chi-square values and p-values for all three mental health outcomes confirm these associations as statistically significant (for depression, anxiety and stress). These findings suggest that frequent social media use may be linked to adverse mental health outcomes, emphasizing the need for mindful social media practices to

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promote mental well-being.

Main Findings, Conclusion and Recommendations Main findings

Female students reported slightly higher mean daily usage of social media than males, with some female students indicating usage for up to 12 hours. This may indicate that females are perhaps more engaged in social media and thus may be exposed more to the negative effects that it brings.

Female students preferred Instagram and TikTok for socializing and entertainment, which frequently feature visual content and social comparison, whereas male students mostly used platforms like Facebook and YouTube for academic purposes and entertainment.

Moderate depression was observed in both, but higher depression, anxiety, and stress were experienced by females, whereas normal stress levels were more among males.

Instagram and TikTok were primarily associated with mental health issues related to social comparison. The impact of WhatsApp was low, and that of YouTube was moderate.

A correlation Heatmap revealed a weak positive relationship between time spent on social media and mental health issues, suggesting other factors (e.g., personality traits or offline relationships) also contribute. But there is very consider correlation among depression anxiety and stress.

Students who frequently checked social media before bed were more likely to experience severe depression, anxiety, and stress. This may be linked to disrupted sleep patterns and

increased exposure to negative content during late-night usage.

Conclusion

This study highlights the fact that excessive social media usage has a significant impact on the mental health of undergraduate students of District Peshawar. It shows that excessive use of social media, especially with visually driven media like Instagram and TikTok, has more negative impacts as it increases the level of depression, anxiety, and stress in students. While social media ensures some benefits, like enhanced communication and academic learning, the adverse effects of this medium outweigh the advantages when usage is left unchecked. Findings highlight the susceptibility of particular students, especially females, to harmful effects of cyberbullying, social comparison, and validation-seeking behaviors that are frequently found on social media. Moreover, frequent usage before bedtime disrupts sleep patterns, exacerbating mental health challenges. The study concludes that without targeted interventions, social media's impact on mental well-being will continue to grow, necessitating immediate attention from educational institutions, policymakers, and society at large.

Recommendations

Conduct workshops and awareness campaigns in educational institutions to inform students about the psychological risks of excessive social media usage and strategies for healthier habits.

Promote time management techniques to limit social media usage, particularly during

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critical hours like bedtime, to alleviate its negative mental health effects.

Encourage collaboration between parents and institutions to monitor and guide students' social media behavior. This can include discussions on setting boundaries for usage.

Advocate for national policies that regulate harmful social media content and encourage platforms to create safer environments for young users.

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