
Social Media and Mental Health in Adolescents

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Author Note

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Abstract

This study employs a quantitative research approach to investigate the relationship between social media use and adolescent mental health. The evolution of social media has revolutionized communication, becoming an integral part of daily life. Numerous studies have shown that adolescents (ages 12-19) spend significant time on social media platforms, impacting mental health. (Kaur et al., 2022) in India. In the case of Nepal, adolescent students spend a good amount of time on social media. However, the impact of using social media by adolescent students is not systematically investigated. (Kharel, 2023) This research study aims to examine the relationship between social media use and adolescent mental health. It has conducted a structured survey with 260 participants from Kathmandu Valley and Dang Valley in Nepal. It has defined various factors as well-being, psychological, risk, value, and perceived factors. Responses were recorded on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha test (0.94) confirms strong internal consistency. While conducting the sampling, a 95% confidence level was assumed, with a desired margin of error set at 5% and an expected population proportion of 0.2. Results indicate no significant gender differences (ANOVA $p = 0.56$), but linear regression analysis reveals a mental health outcome of 12.5. Cronbach's alpha test (0.94) confirms strong internal consistency. The findings indicate no significant gender differences but emphasize the need for targeted interventions to mitigate social media's negative impact on adolescent mental health. Mental health professionals should focus on early detection, its impact, and preventive strategies to support adolescent mental health.

Keywords: Social media impact, adolescent mental health, social media and mental health, positive and negative impact of social media, mental health survey

Introduction

This quantitative study examines the relationship between social media and adolescent mental health. Mental health plays a great role for adolescents in molding their future. According to mental health survey reports, it has

been continuously increasing day by day in recent times. Mental health issues can cause anxiety, stress, mood disorders, addiction, and personality disorders. (Braghieri, 2022). With growing concerns about mental health, quantitative research is being used to perform

diagnostic analysis and understand its relationship with social media. During adolescence, the brain undergoes significant changes. This period is the most valuable for influencing an adolescent's mental health.

Humans are social creatures who require companionship from others to lead a healthy life. Social media is exponentially taking over human spaces rapidly for communication and interaction. It is becoming a need as well as an essential activity in daily life. Due to the affordable facility of IoT (Internet of Things), it has widespread expansion, including in remote places and all communities. In developed countries, social media is widely integrated into daily activities. Therefore, it is complex to characterize social media usage on either aspect of positive and negative concerning mental health. As per recent literature reviews, it has been mentioned that technology itself may not be the primary cause of mental health challenges, as it needs to have further examination of its impact. (Aryal & Rajbhandari, 2024). Therefore, it has drawn their urgent attention to this topic to identify the connection between social media and adolescent mental health.

During adolescence, the brain goes through considerable changes and is an immature stage. This period is the most valuable period for focusing on one future career. Adolescence is the age between 12 and 19 years. Today's youth are occupying time in digital spaces, seeking virtual interactions, which do not fully replace real-world experiences. However, the rise of social media led to virtual identities rather than direct human connection. Quantitative research is required for early detection of social media activity to identify its pattern, trends, and impact. There are still a lot of unanswered questions regarding the relationship between social media and mental health studies of adolescence in the context of Nepal. A more in-depth examination is required to explore both the benefits and challenges associated with social media use.

Previous investigations have provided valuable insights, but still there lack the numerous factors influencing mental well-being. While this topic has been widely researched in other countries, it has seen limited attention in Nepal. In Nepal, there has been no systematic research to assess the extent to which social media affects adolescent mental health. (Dhakal, 2023). Hence, this study seeks to determine

whether social media has either a positive or negative impact on adolescents.

It has done an investigation on various factors on adolescent mental health having social media usage. The questionnaire has been developed by domain expertise, having a five-point Likert scale and a survey conducted through Google Forms. The various factors are mentioned as Well-being Factor to measure the emotional and mental stability. Psychological factors for examination of stress, anxiety levels, and mood disorders due to social media use. Risk Factor is to investigate the risk that is associated with exposure to online platforms due to addiction to them. Value Factor is to explore how social media aligns with personal and societal values. Perceived Factor is to analyze adolescents' perceptions due to influence from the use of social media.

It has checked the correlation of various factors as well-being (H0) and psychological factors (H1), risk and perceived factors, and value and perceived factors that help to identify the strength and correlation between the two factors.

This quantitative research aims to bridge a knowledge gap by examining the impact of social media on the mental health of adolescents (12 to 19 years' group) in Nepal. The investigation assesses how social media engagement affects male and female participants separately. Furthermore, it investigates contextual findings for parents, educators, and mental health professionals regarding this unknown fact of social media use and adolescent mental health in Nepal. It also helps to determine the behavior of adolescents as per various mentioned factors. Additionally, it explores how adolescents behave in society, as their behavior can vary depending on various factors which have been mentioned in this research.

Literature Review

The research is targeted to provide comprehensive knowledge of the influence of social media on mental health by combining data from surveys and social media analytics. A different literature review and its methodologies have been studied, and ideas for analyzing the works have been summarized. The researchers have mentioned T-scores and Z-scores to measure the positive and negative outcomes of social media use. The research has taken data from the national survey of India. It shows that

social media significantly impacts adolescents and increases its effect rapidly. Researchers also mentioned that adolescents put their phones under their pillows and frequently use them during sleeping time. This research explains how social media effects have been increasingly affecting adolescents in the last few years. It has been seen they use their valuable time using social media such as Facebook, YouTube, WhatsApp, TikTok, and Twitter. (Kaur et al., 2022)

Social media has occupied a space in human life unknowingly. It has been seen that the adolescence period is the time for making future decisions and the golden period. The author finds adolescents use it for their daily tasks and are more prone to addiction connected to social media. It shows the greater impact on one's personal life as well as causing disturbances to the culture, economy, and well-being of a society. Adolescence is a very critical phase of human life. This stage is referred to as bringing storms and stress to them. As per the national survey of India, as it has been seen, 73% of adolescents use social media networking sites (SNS). It has seen a 55% rise in the last three years of the survey. It has been seen from the National Survey of India that cybercrime has almost increased to the highest level in Karnataka. This behavior shows that social media impacts adolescents negatively. The data shows that excessive use of social media is harmful to adolescent psychology. In this research, a composite index has been used in data to see its impact on adolescents (Schønning et al., 2020)

Researchers have mentioned that adolescence uses social media significantly. A survey of Australian adolescents using social media sites and indicators of adjustment from 34 diverse high schools in different regions was conducted. The research shows that negative indicators have been seen in female adolescents as compared to male adolescents. Even though gender had no influence, there was a link between social network use and measures of adjustment. The complexity of the association between adolescents' usage of social networking sites and measures of adjustment has been underlined by the author in the research study. It has been tested on adolescents from Australian high schools. While doing the survey, it has made

the groups who highly spend time on social media like Facebook and adolescents who spend little time on social media. To conduct the investigation, a survey questionnaire was created to assess how often and for how long social media has been used. While engaging in the activities, adolescents responded to the steps outlined in the research, such as losing or gaining appetite when in an upset mood, feeling that their problems were becoming harder to handle, feeling unhappy or depressed, and sensing that nothing was enjoyable when looking forward to them due to high usage of social media platforms. (Blomfield Neira & Barber 2020). In research analysis, variance methods were carried out. As per the author, these findings have been done to explore the relationship between male and female adolescents. The regression analyses used to predict depressive mood have figured in the research. Research shows that male and female indications of adjustment are different. It may harm female adolescents, whereas positive activity is for male adolescents. It is crucial to keep in mind that such research is particularly difficult considering how social network technology influences teenage behavior. The previous study has seen an umbrella review conducted to identify the impact of social media. An umbrella review, commonly referred to as a meta-review, has been used. It has emphasized the necessity to consider risk and preventative factors and improve media-related behaviors. The researchers mentioned that social media has been impacting the mental health of adolescents for the past few years only. The adolescent period is a vulnerable period of human life as they cannot make any proper decisions, and their mind perspective way of thinking is different. They show different behaviors as they compare their lives with others on social media. Comparing it and harming themselves generates mental health issues like depression. Twenty-five reviews were found through this investigation, comprising nine narrative reviews, nine systematic reviews, and seven meta-analyses. Researchers use an umbrella review strategy of all the evidence in the research. Researchers reviewed journal articles appraised from 2019 to 2021. The purpose of this study is to better understand how social media affects our teenagers' mental health and why parents,

researchers, and policymakers need to be aware of it. The author identified the gap as risk and preventive variables that might reveal whether adolescents are most vulnerable to the impacts of social media users are not given enough consideration (Valkenburg et al., 2022). With explanations and contrasting perspectives, the gap can be located. It also makes suggestions for future research projects.

Another study uses a systematic review to examine the relationship between social media use and mental health. It has done eight cross-sectional studies, two qualitative investigations, and three longitudinal studies. This has explained that social media addiction, certain hobbies, and time spent online may all be factors in mental health issues. The purpose of this research is to analyze how using social media affects mental health. It has mentioned excessive use of social media, spending little time on social media, and those who are addicted to social media are the cause of mental health problems (Karim et al., 2020)

However, other research findings show there is less connection between social media and mental health like depression. It has been seen that adolescents are the more active users of social media. This focuses on the relationship between mental health and the use of social media among adolescents for awareness. It has underlined that more study is needed, particularly on social media interaction and its beneficial effects (Vuorre et al., 2021)

The researcher has explained and studied the relationship between online social support (OSS) and mental health. It has shown that the relationship between social media and mental health correlates with self-esteem. It has been shown that adolescents who use social media

platforms have higher self-worth. Social media offers the opportunity for adolescents to boost their self-esteem and overall emotional health. (Zhou & Cheng, 2022)

Methods and Materials

A quantitative research approach was employed in this study to identify different factors influencing mental health. A questionnaire was developed by domain expertise to identify different factors influencing mental health. The survey was Conducted on Google online Forms. A five-point Likert scale was used to determine response of adolescence. The study focused on five factors as below:

Well-being Factor: It measures the emotional and mental health stability of a person.

Psychological Factor: This factor helps to find out the stress, anxiety level, and mood disorders related to the use of social media.

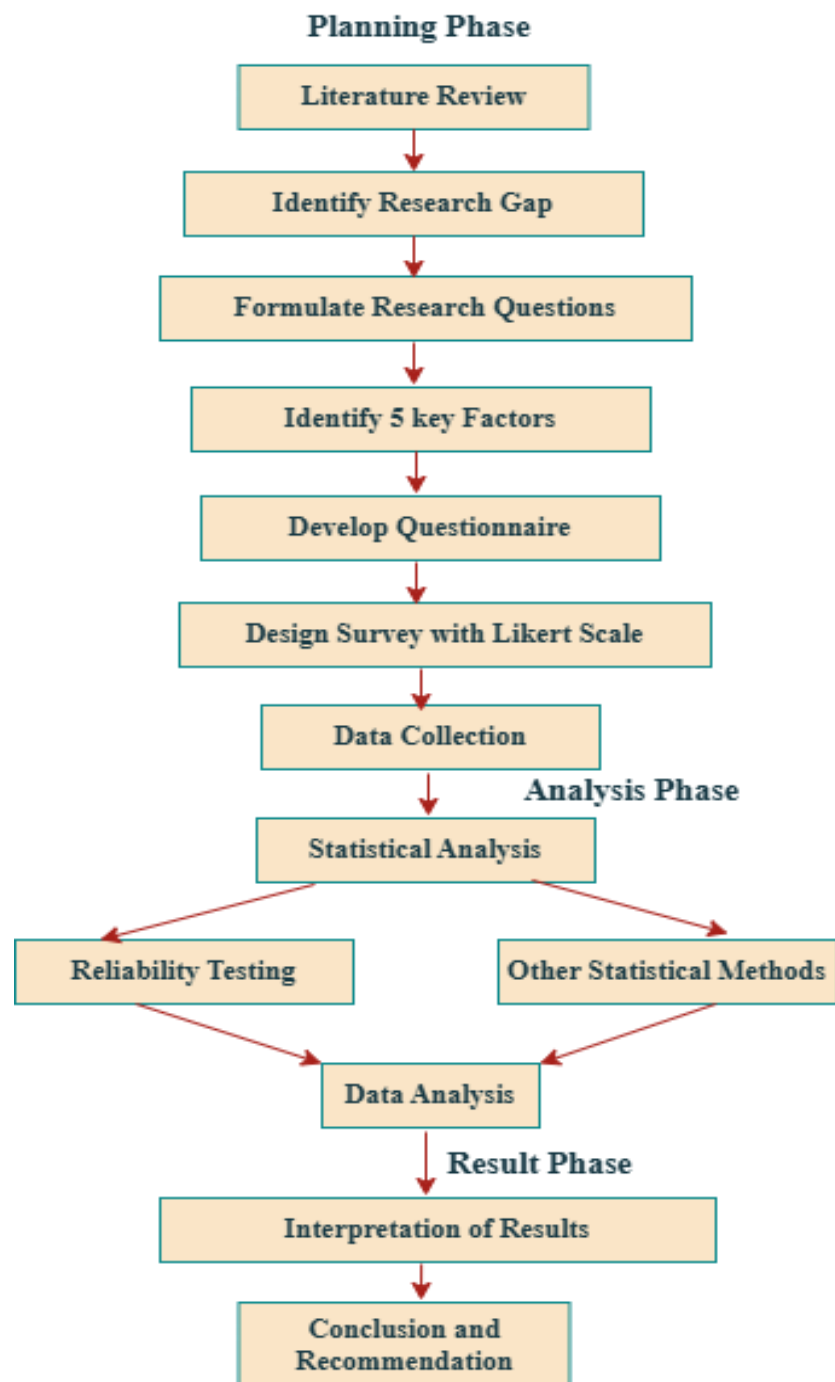
Risk Factor: It is an investigation into online harassment exposure and addiction to social media usage.

Value Factor: It finds out how the social media use aligns with personal and societal values.

Perceived Factor: It investigates adolescents' perceptions as impacted by the use of social media.

It has the use of linear regression method to determine mental health outcomes. It has conducted data reliability testing using a crunch-based algorithm for data compression and optimization. Cronbach's alpha test confirmed strong internal consistency, ensuring the validity of the questionnaire. A total of 260 responses were collected, with a calculated sample size of 246.

Table 1
Methodology and Analysis Flow



This flow chart outlines the research methodology having concept definition, literature Review, data collection and survey process, data validation and analysis.

Evaluation criteria

All participants' privacy and confidentiality were maintained throughout the survey and questionnaire process. It strictly adhered to the ethical guidelines. Primary was collected through surveys and questionnaires, ensuring reliability. A total of 20 questions were used to assess the outcomes across different factors, with four questions dedicated to each factor. It has

Well-being factor, Psychological Factor, Risk Factor, Value Factor, and Perceived Factor.

It was graded on a point scale (1 = strongly disagree to 5 = strongly agree).

Cronbach's alpha is used to determine internal consistency and reliability of the scales. It gives the internal consistency of the questionnaires. A value of 0 indicates no internal consistency, while a value of 1 suggests perfect consistency between the questionnaires.

An ANOVA and regression analysis were conducted to obtain mental health outcomes. After collecting survey data, it has been validated and undergone a mathematical analysis process. The ANOVA can be used to determine whether the social media impact has had a statistically significant effect on results for gender

$$n = \frac{Z^2 \cdot p \cdot (1 - p)}{E^2}$$

Where,

n = sample size

Z = Z-score corresponding to the desired level of confidence

p = expected population proportion

E = desired level of precision (margin of error)

Assuming a 95% confidence level ($Z = 1.96$), a desired margin of error of 5% ($E = 0.05$), and an expected population proportion of 0.2, these

$$n = \frac{1.96^2 \cdot 0.2 \cdot (1 - 0.2)}{0.05^2} = \frac{3.842 \cdot 0.2 \cdot 0.8}{0.0025} = 245.88$$

groups. It helps draw evidence-based conclusions about gender-related phenomena.

Correlation is used to assess the relationship between the factors. Linear regression methods were applied to examine the connection between a dependent variable, which is x and independent variables, which is Y . The result has been placed in a clear, logical, and precise manner, based on the data analysis.

$$(Y) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5$$

According to the UNFPA (United Nations Fund for Population Activities) in 2022, the estimated population updated on July 16, 2023, is 30,939,939. All the data has been analyzed, and further calculations have been made for the survey (United Nations Population Fund, 2022)

The adolescent population is 24 percent of the entire population of Nepal. According to the U.N. revision, Nepal's total population is 30,939,939 (nairobi-summit.org, 2022)

Sample Size

To calculate the sample size using a formula, we need to determine the desired level of precision, the desired level of confidence, and the expected population proportion. The formula for calculating the sample size for estimating the population proportion is:

values can be plugged into the formula to calculate the sample size:

The sample size (n) is approximately 245.88. Therefore, according to the formula for estimating the sample size, a minimum of 246 participants (rounded figure) is required. However, the survey

questionnaires encompass a total of 260 participants.

Results

Cronbach's Alpha for Reliability Testing

$$\text{Cronbach's } \alpha = \frac{N}{N-1} \left(1 - \frac{\sum_{i=1}^k \sigma_{X_i}^2}{\sigma_T^2} \right)$$

where:

N = Total number of items or questions in the test

k = Number of items or questions

$\sigma_{X_i}^2$ = Variance of the scores on the i th item or question

σ_T^2 = Variance of the total test scores

$$\begin{aligned} \text{Alpha} &= \left(\frac{20}{20-1} \right) \left(1 - \frac{24.0}{235.3} \right) \\ &= 0.9451 \end{aligned}$$

The value of alpha is 0.9451, which indicates excellence in internal consistency and reliability.

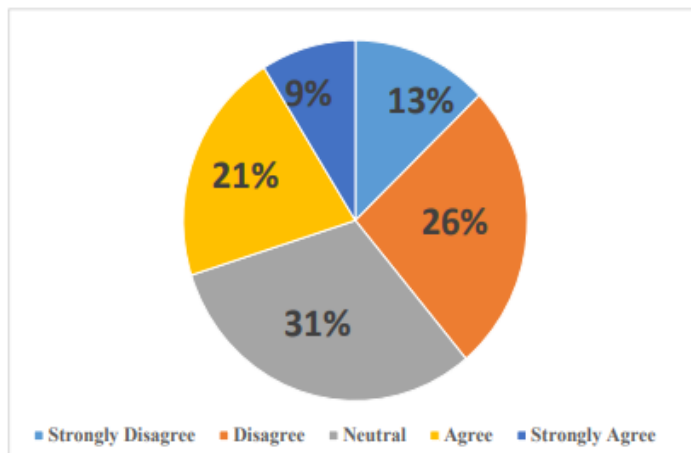
Visual Representation of Survey Results

The following figures illustrate key findings from the survey, highlighting different aspects of social media's impact on adolescent mental health. The data explores participants' responses

to anxiety and stress due to social media inaccessibility, exposure to harmful content, its effect on sleep patterns, and the balance between social media use and mental well-being. These insights provide quantitative analysis with clearer understanding of how social media influences various mental health factors. This study follows a quantitative research approach.

Figure 1

Participants' Response to Anxiety or Stress Due to Inability to Access Social Media

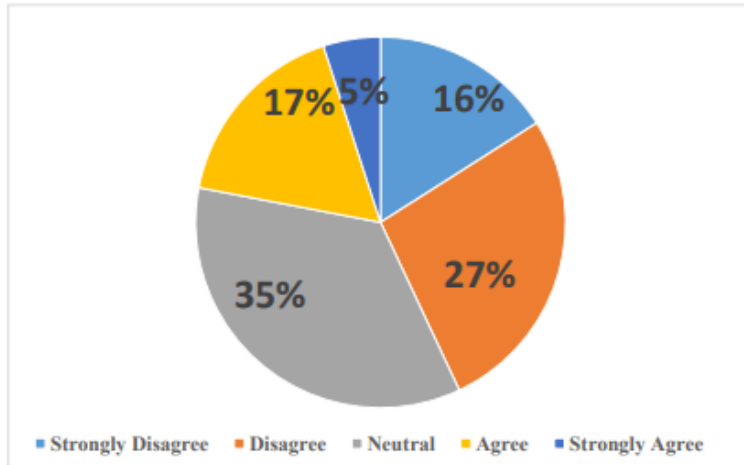


The chart shows survey results about feeling anxious or stressed due to the inability to access social media. The majority of participants, 31%,

remained neutral, while 26% disagreed with feeling anxious or stressed.

Figure 2

Participants' Exposure to Potentially Harmful or Distressing Content on Social Media

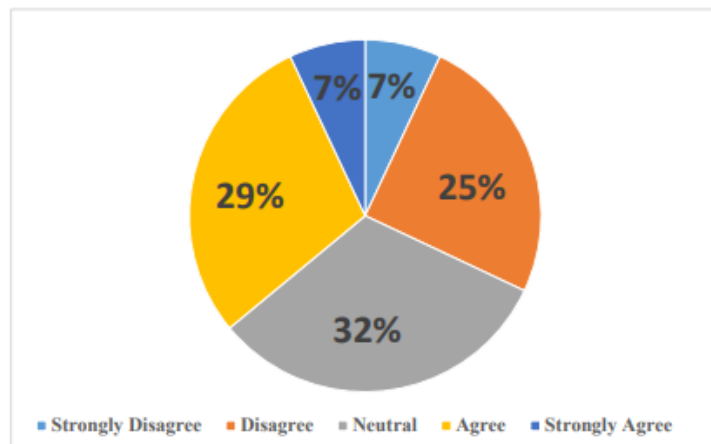


The survey result revealed that 35% of participants remained neutral, 27% disagreed, 16% agreed, and 17% strongly agreed that they

have encountered potentially harmful or distressing on social media platforms.

Figure 3

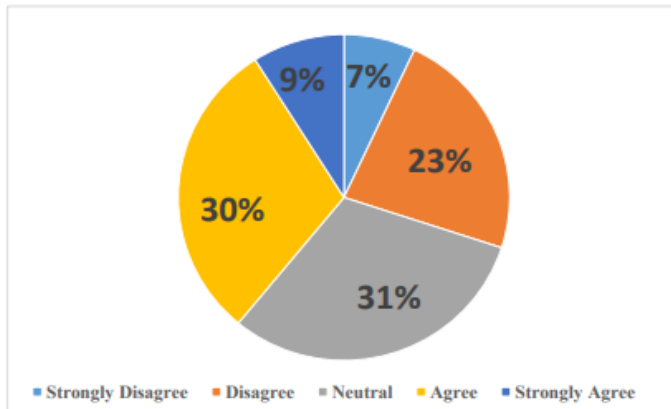
Impact of Social Media Usage on Sleep Patterns



The survey findings show that 29% of participants agreed, 32% felt neutral, 25% disagreed, and 7% strongly agreed that their sleep patterns were affected by social media

usage. These results suggest that a portion of respondents experienced sleep disturbances due to their social media habits.

Figure 4
Balance Between Social Media Use and Mental Health



The survey aimed to understand the connection between maintaining a healthy balance between social media use and mental health. The results showed that 30% of participants agreed, while 31% remained neutral on the issue. These findings suggest that maintaining a balance between social media use and mental health received less attention or was less prioritized by the surveyed group.

ANOVA Result

An ANOVA (Analysis of Variance) test was conducted, as shown in the figure below. The responses were measured on a 5-point scale, where 1 represents strongly disagree and 5 represents strongly agree.

Table 2
Summary of Groups

Groups	Count	Sum	Average	Variance
Male group	20	7619	380.95	443.9447368
Female Group	20	7697	384.85	524.8710526

The table shows the sum, average, and variance of the male and female groups.

Table 3
ANOVA Test Results

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	152.1	1	152.1	0.31399158	0.57852998	4.098171731
Within Groups	18407.5	38	484.4078947			
Total	18559.6	39				

$p\text{-value} > 0.05$: The null hypothesis is not rejected.

$p\text{-value} \leq 0.05$: The null hypothesis was rejected in favor of the alternative hypothesis.

Here, $p\text{-value}$ is 0.57 in an ANOVA test indicating that there are no differences in the impact of social media between the two groups. Within the group, df of 38 means that we have 38

degrees of freedom associated with the variations within each group. It shows the data flexibility within the group.

Correlation

With the help of correlation analysis, the degree and nature of the association between various factors are measured.

Table 4

Correlation Matrix: Relationship Between Well-Being, Psychological Variables, Risk Factors, and Perceived Factors

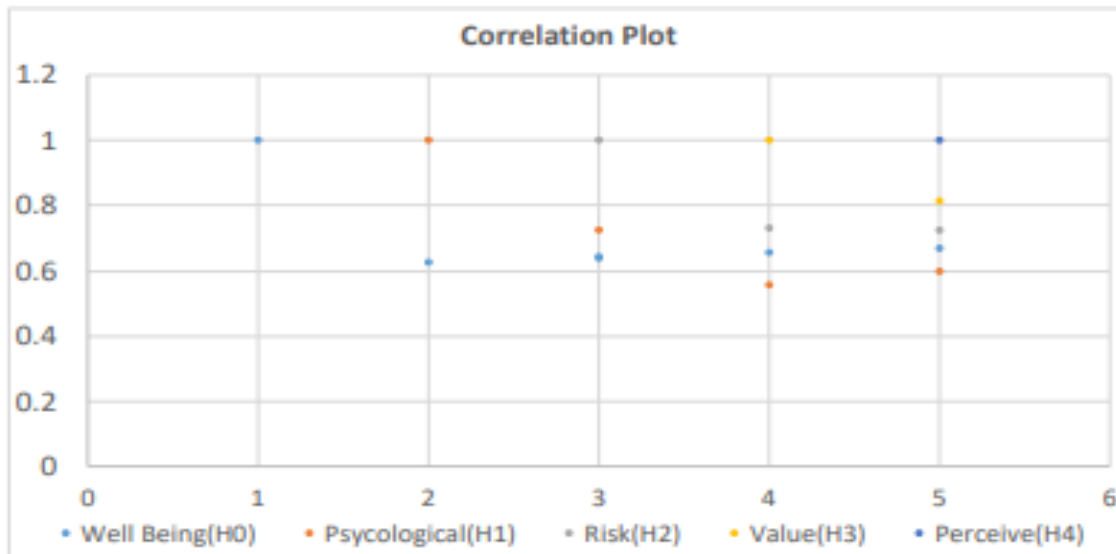
	Well Being (H_0)	Psychological (H_1)	Risk (H_2)	Value (H_3)	Perceive (H_4)
Well Being (H_0)	1				
Psychological (H_1)	0.629033113	1			
Risk (H_2)	0.641319436	0.723168909	1		
Value (H_3)	0.653928794	0.558999723	0.72919	1	
Perceive (H_4)	0.666873153	0.600896108	0.72272	0.8127458	1

The correlation between H_0 and H_1 shows 0.62, indicating a linear increase in the relationship between these two values. H_1 and H_3 correlate 0.558999723. As well-being (H_0) and psychological variables (H_1) correlate substantially positively, psychological factors might add significantly to well-being. This implies that values of H_3 (value perception) tend to grow

when values of H_1 (psychological variables) increase, and vice versa. Risk factors (H_2) and perceived factors (H_4) have a relatively significant positive correlation. This shows that the perception factors tend to grow along with the way of risk. Value and perception have a strong positive link between (H_3 and H_4).

Figure 5

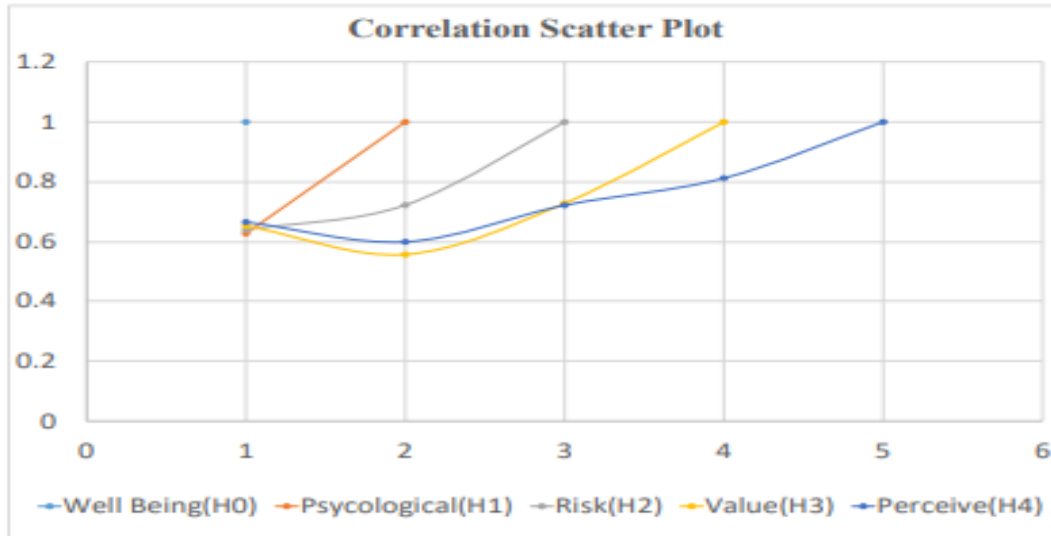
Correlation Scatter with Dot



The correlation scatter with the dot plot shows data point on various factors and their

distribution. It emphasizes specific data points and their variations across different factors.

Figure 6
Correlation Scatter with straight lines and markers



It emphasizes the trend and relationship between the factors or highlights the lines of best fit.

Linear regression

The independent variables $x_1, x_2, x_3, x_4,$ and x_5 are examined with the dependent variable with age. There is no statistically significant association between age in genders and any of the independent variables. The value of intercept and beta has been calculated.

Intercept (beta0): 11.663158894457498
Beta values (coefficients): [0.08901496, -0.08558709, 0.09070727, 0.11859358, 0.09113308]

Independent variable values are:
 $x_1 - 3.06, x_2 - 2.74, x_3 - 2.89, x_4 - 3.03, x_5 - 3.02$

Using Linear regression analysis,
Mental health (Y) = $\beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5$

$$Y = 11.663158894457498 + 0.08901496 \cdot X_1 - 0.08558709 \cdot X_2 + 0.09070727 \cdot X_3 + 0.11859358 \cdot X_4 + 0.09113308 \cdot X_5 \dots\dots\dots (1)$$

$Y=12.5$

Where, X_1 - Well-being factor

X_2 : Physiological factor
 X_3 : Risk factor
 X_4 : Value factor
 X_5 : Perceive factor
Mental health outcomes (Y) = 12.5

Discussion/Implications

Analysis of the Data

The result of this quantitative research study provides insights into the relationship between social media and adolescent mental health. Major things collected from this data regarding anxiety and stress: the majority of participants, 31%, felt neutral about experiencing anxiety or stress due to the inability of social media, whereas 26% disagreed with it. It means adolescents do not fully agree that social media access impacts mental health; it means there may be other factors related to mental health.

Regarding the questionnaire on exposure to harmful content, it revealed 16% agreed and 17% strongly agreed with it, whereas 35% remained neutral. This pattern indicates that there are mixed natures of experiences in adolescence on social media platforms, as some face exposure to harmful content, whereas others do not perceive it as a significant issue.

On the questionnaire about the impact on sleep due to social media, 29% agreed that social media affected their sleep. It indicates that excessive use of social media could disrupt sleep. However, it has shown that 32% remained neutral. This pattern indicates it may be influenced by individual factors that may be lifestyle or usage habits.

Regarding the balance between social media and mental health response, it showed that 31% were neutral on it. This neutrality group shows a lack of awareness of social media's impact on mental health. By analyzing the findings on social media effects on mental health, its impact varies widely on adolescent groups.

Comparison with Previous Studies

Several previous studies have revealed a relationship between social media and mental health, that heavy use of social media increased the risk of anxiety and depression in adolescents that aligns with some findings in this study, here Participants' response to anxiety or stress due to inability to access social Media has 31% are neutral regarding anxiety and stress, and 21% agree on it. (Karim et al., 2020). It has been mentioned in another research that more exposure to disaster news through social media was associated with mental health problems, causing high levels of depression and stress (Zhao & Zhou, 2020)

On the other hand, it has been highlighted that social media use is not harmful; other factors play an essential role for the mental health of adolescents, as social media helps to boost their self-esteem and overall emotional health (Zhou & Cheng, 2022).

Regarding the finding of sleep disturbances due to the use of social media in this research activity, 29% of participants agreed with it, as social media affected their sleep patterns, as this has been found to be a problem in sleep due to the use of social media. It has been found in other research that the use of social media late at night affected the sleep of adolescents. (Blomfield Neira & Barber, 2020)

Future Research Suggestions

This study contributes valuable insights, but it needs to explore longitudinal studies as it provides clearer insights into the long-term effects on social media and mental health of adolescents. It has a small sample size in this

quantitative research study, as in future research it should take in diverse populations so that it helps to generalize more to understand the relationship between social media and mental health across different demographics. By adding qualitative research, having interviews with adolescents could provide a deeper understanding of their experience with social media and their mental health in a deeper way in this study.

Recommendations and Limitations

Recommendations

This study concluded that social media does not have a statistically significant impact on mental health difference between male and female adolescents' group. As mental health is the complex issue which is influenced by multiple other factors beyond social media usage. It has to be studied to explore the environmental conditions together with psychological elements that influence adolescent mental wellness. Longitudinal research with diverse population samples will help to discover additional psychological effects of social media use on mental health as well as relationships which social media causes indirectly. It is advised to have research on a larger population and different groups of people in the community. Schools and educators should address the potential mental health risks associated with social media by integrating health education programs. They should also encourage adolescents to maintain a balanced approach to their usage.

Limitations

This study has a few limitations that should be considered in future research. First, the sample size is relatively small, and there is a need for more extensive research with a broader scope. Additionally, adopting a longitudinal approach with long-term studies would provide clearer and more conclusive findings, helping to better understand the long-term effects of social media on adolescent mental health.

Conclusion

This quantitative research examined the impact of social media on adolescent mental health, with a particular focus on whether there were statistical variations between male and female participants. The findings revealed no

statistical variations in social media effects between male and female adolescent participants, as it suggests exploring other psychological and environmental conditions that may create significant effects on mental health outcomes. It aligns with previous research that maximum use of social media can cause stress, anxiety, and sleep disturbance in individual adolescents influenced by broader contextual factors rather than gender alone.

This research study has contributed to how adolescents perceive social media's impact on their mental health and the importance of adopting a more comprehensive approach to this. It has observed neutral responses in several aspects of the study; it should be better in future research to have extensive methods and longitudinal study for clearer understanding of social media's effect on mental health. By refining research methods and expanding the scope of investigation, future studies can provide more insight to inform policies and mental health strategies for adolescents in the digital age.

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