

EXPLORING THE RELATIONSHIP BETWEEN SOCIAL MEDIA ADDICTION, GENDER, BMI, AND HEALTH PROBLEMS AMONG UNIVERSITY STUDENTS IN WESTERN ODISHA: A STATISTICAL ANALYSIS

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Abstract

Social networking sites (SNSs) have become ubiquitous in modern times, with millions of users across the globe. However, excessive use of SNS can lead to cyber addiction, which has several negative effects on one's psychosomatic health. The primary objective of this investigation is to ascertain the presence of substantial disparities between the male and female populations in relation to several key factors: Body Mass Index (BMI), the overall quantity of Social Networking Sites (SNSs) accounts, the propensity for addiction to SNSs, health-related complications, the percentage of marks attained in the most recent examination, and the extent of their interrelationships. The data was collected through a questionnaire survey of 300 participants with 149 (49.7%) male and 151 (50.3%) female respondents from GM University (GMU) and Sambalpur University Institute of Information Technology (SUIIT). The data analysis was done through Microsoft Excel and SPSS 26.00. Kruskal-Wallis Rank Test, Chi-square Test, and Correlation analysis were performed on Gender, BMI, Health Problem (HP), Number of SNSs account, Addictiveness, and percentage of marks secured. The results reveal a significant positive correlation between SNS addiction and BMI status, indicating that excessive social media use can contribute to an increased BMI. Nonetheless, the findings of this study reveal that there were no substantial disparities between genders concerning Social Networking Sites (SNSs) addiction and its impact on Body Mass Index (BMI). However, our analysis demonstrates a highly significant distinction between genders in terms of BMI status ($\chi^2 = 24.626$, $p < 0.01$), the number of SNS accounts ($\chi^2 = 34.048$, $p < 0.01$), and Health Problem (HP) scores ($\chi^2 = 49.984$, $p < 0.01$). Conversely, no noteworthy dissimilarity was observed between gender and SNS addiction ($\chi^2 = 1.035$, $p < 0.05$), as well as the percentage of marks attained ($\chi^2 = 11.881$, $p < 0.05$). Kruskal-Wallis 'H' Test shows that BMI status for Males (mean rank = 169.04) dominates that of females (mean rank = 132.21) with an 'H' value of 17.593 ($p < 0.01$). Similarly, Kruskal-Wallis 'H' Test shows that the HP score for Females (mean rank = 161.37) dominates that of Males (mean rank = 139.49) with 'H' value of 4.813 ($p < 0.05$) and no. of SNS account for Male (mean rank = 167.57) dominates that of Female (mean rank = 133.65) with 'H' value of 11.825 ($p < 0.01$). Similarly, H Test shows that SNS addiction for Females (mean rank = 154.64) dominates that of Males (mean rank = 146.31) with an 'H' value of 1.031 ($p > 0.05$). This study places significant emphasis on elucidating the detrimental consequences of Social Networking Sites (SNSs) addiction on the physical and mental well-being of university students residing in western Odisha. Moreover, it highlights the imperative of conducting additional research endeavors in this domain. The outcomes of this investigation hold practical value for healthcare practitioners, educators, and policymakers, as they can inform the development of targeted interventions aimed at averting SNS addiction and mitigating its adverse impact on the health and overall welfare of university students.

Keywords: Social Networking Sites (SNSs), Cyber addiction, Body Mass Index (BMI), Psychosomatic health (PH), University Student, Kruskal-Wallis test

1. Introduction

Social networking sites (SNS) have become increasingly popular among university students in recent years. With the rise of SNS, there has been growing concern about the potential negative effects of excessive SNS use, including addiction and its impact on psychosomatic health. Cyber addiction is a form of addiction that is characterized by compulsive and excessive use of digital technologies, including SNS (Kuss & Griffiths, 2017). The current study aims to explore the relationship between social media addiction, gender, body mass index (BMI), and health problems among university students in western Odisha.

The extant body of research has put forth compelling evidence indicating that the addiction to social media can exert a substantial influence on the physical and mental well-being of individuals (Andreassen et al., 2017).

Additionally, scholarly investigations have consistently revealed that females exhibit a greater propensity for social media usage and dedicate a larger portion of their time to engaging with various social networking sites, as compared to their male counterparts (Pew Research Center, 2018). In addition, there is evidence to suggest that there is a relationship between BMI and social media addiction (Alzahrani et al., 2020).

In light of preceding investigations, the current study endeavors to expand upon existing knowledge by meticulously investigating the interplay between social media addiction, gender, Body Mass Index (BMI), and health complications within the population of university students located in western Odisha. This research seeks to address the following specific research inquiries:

1. Do male and female students significantly differ in terms of body mass index (BMI), total number of social networking sites (SNSs) accounts, social media addiction, health problems, and percentage of marks scored in the last examination?
2. Is there a relationship between social media addiction and BMI status among university students in western Odisha?
3. What are the implications of the study findings for healthcare professionals, educators, and policymakers?

2. Objectives

The main objective of this study was to investigate the relationship between social media addiction, gender, body mass index (BMI), and health problems among university students in Western Odisha. Specifically, the study aimed to:

1. To assess if male and female students of Western Odisha Universities differ significantly with respect to BMI status through the use of SNS.
2. To assess if male and female students of Western Odisha Universities differ significantly in respect of SNS accounts
3. To assess if male and female students of Western Odisha Universities are equally susceptible to health problems through the use of SNS.
4. To assess if male and female students of Western Odisha Universities are equally susceptible to SNS addiction.
5. To assess if male and female students of Western Odisha Universities differ significantly in academic performance.

3. Hypotheses

The following are the hypotheses for this study:

1. **H₀**: There is no substantial disparity between male and female university students regarding variables such as Body Mass Index (BMI), the overall count of Social Networking Sites (SNSs) accounts, addictiveness related to SNS usage, health issues, and the percentage of marks attained in the most recent examination.
2. **H₁**: Significant disparities are evident between male and female university students concerning various factors, including Body Mass Index (BMI), the total count of Social Networking Sites (SNSs) accounts, addictiveness associated with SNS usage, health issues, and the percentage of marks achieved in the most recent examination.

4. Materials and Methods

Utilizing a cross-sectional design, this study gathered data by means of a structured questionnaire survey conducted among 300 university students enrolled at GM University and Sambalpur University Institute of Information Technology. The sample comprised of 149 (49.7%) male and 151 (50.3%) female respondents. The survey instrument was developed based on previous studies, and the items were evaluated for content validity and reliability through a pilot study.

The survey instrument comprised six sections: demographic information, body mass index (BMI) status, social networking sites (SNS) addiction, health problems (HP) score, number of SNS accounts, and percentage of marks scored in the last examination.

The data were analyzed using Microsoft Excel and SPSS 26.0. Kruskal-Wallis Rank Test, Chi-square Test, and Correlation analyses were performed to determine the relationship between gender, BMI, SNS addiction, health problems, number of SNS accounts, and percentage of marks scored.

5. Data Analysis

Gender Distributions

Table 1: Frequency distribution of gender

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Gender	Frequency	Percentage
Male	149	49.70%
Female	151	50.30%

From above Table 1, we have observed a frequency of Males 149 (49.7%) and Females 151 (50.3%) from a total of 300 university students.

BMI Categories and BMI Status

Bar Chart 1: Gender wise BMI Status

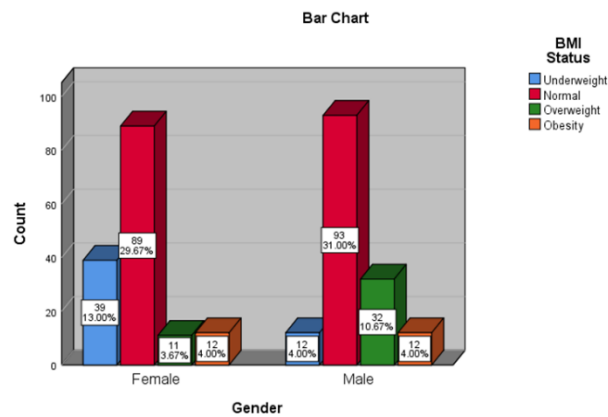
BMI Categories:

Underweight = <18.5

Normal weight = 18.5–24.9

Overweight = 25–29.9

Obesity = BMI of 30 or greater



From the above Bar Chart 1 it is noticed that BMI Status of Females and Males Category wise as; Underweight= 17% (Females= 13% and Males=4%), Normal= 60.7% (Females= 29.7% and Males= 31%), Overweight= 14.3% (Females= 3.7% and Males= 10.7%) and Obesity= 8% (Females= 4% and Males= 4%) out of 300 university students. Here, we have observed that the Normal (60.7%) BMI categories are maximum than others followed by Underweight (17%), Overweight (14.3%), and Obesity (8%) as the minimum.

Table 2: Chi-square test (χ^2)

Variable	χ^2	p-value
Gender vs BMI status	24.626	<0.01
Gender vs no. of accounts	34.048	<0.01
Gender vs HP score	49.984	<0.01
Gender vs SNS addiction	1.035	>0.05
Gender vs % of mark	11.881	>0.05

Table 3: Mean Ranks for Kruskal-Wallis Rank Test **Table 4: Kruskal-Wallis Rank Test Results**

Variable	Male	Female
BMI	169.04	132.21
SNS addiction	146.31	154.64
Health problems	139.49	161.37
SNS accounts	167.57	133.65

Variable	H Value	p-value
Gender vs BMI	17.593	<0.01
Gender vs SNS	1.031	>0.05
Gender vs HP score	4.813	<0.05
Gender vs Accounts	11.825	<0.01

6. Findings

1. The results revealed that there exists a significant positive correlation (0.121, $p < 0.05$) between SNS addiction and BMI status, indicating that excessive social media use can contribute to an increased BMI.
2. The analysis reveals a substantial and statistically significant distinction between genders concerning BMI status ($\chi^2 = 24.626$, $p < 0.01$), the number of accounts ($\chi^2 = 34.048$, $p < 0.01$), and HP score ($\chi^2 = 49.984$, $p < 0.01$). However, no significant difference is observed between gender and SNS addiction ($\chi^2 = 1.035$, $p > 0.05$), as well as the percentage of marks ($\chi^2 = 11.881$, $p > 0.05$).
3. Kruskal-Wallis 'H' Test for gender and BMI status shows 'H' value of 17.593 ($p < 0.01$). Thus, it may be inferred that male and female students significantly differ in BMI status. Again, the mean rank for male=169.04 and females =132.21 indicates that males dominate females in BMI status.
4. Similarly, Kruskal-Wallis 'H' Test for gender vs. SNS addiction shows an 'H' value of 1.031 ($p > 0.05$). Thus, it may be inferred that male and female students significantly do not differ in SNS addiction. Again, the mean rank for males =146.31 and females =154.64 indicates that males are dominated by females in SNS addiction.
5. Kruskal-Wallis 'H' Test shows that the HP score for Females dominates (mean rank=161.37) that of Males (mean rank=139.49) with an 'H' value of 4.813 ($p < 0.05$). Thus, it may be inferred that male and female students significantly differ in health problems.

7. Limitations

The study was conducted in only two universities in Western Odisha, which may not represent the entire population of university students in the region. Therefore, the generalizability of the findings to other universities or regions may be limited. In future studies, researchers may consider conducting a larger and more representative sample from multiple universities in the region.

The data collected in this study relied on self-reported questionnaires, which introduces the possibility of response bias. Participants may have potentially underestimated or exaggerated their levels of social media addiction and health problems. To address this limitation, future research endeavors could explore alternative approaches, such as utilizing objective measures like physiological assessments or behavioral observations, to enhance the accuracy and reliability of data collection.

The study was cross-sectional, which means we cannot establish a causal relationship between social media addiction, BMI, and health problems. Longitudinal studies are needed to establish a temporal relationship between these variables.

The study did not control for other potential confounding variables, such as age, ethnicity, socioeconomic status, or academic performance, which may affect the relationship between social media addiction, BMI, and health problems. Future studies may consider controlling for these variables to increase the internal validity of the findings.

8. Discussions

Despite the inherent limitations, our study carries profound implications for both research and practice. The results unveil a notable and positive association between social media addiction and BMI status, implying that excessive engagement with social media platforms can be linked to higher BMI levels. This discovery aligns with prior research highlighting the connection between sedentary behavior and elevated BMI.

Our study also found that there were no significant gender differences in SNS addiction and its impact on BMI. However, there were significant gender differences in BMI status, number of SNS accounts, and health problems. These findings highlight the need for gender-specific interventions to prevent SNS addiction and promote healthy behaviors among university students.

The high significant difference between gender with BMI status, number of accounts, and health problems suggest that male students may be more vulnerable to social media addiction, while female students may be more susceptible to health problems associated with social media addiction. Therefore, interventions should target these gender-specific vulnerabilities to prevent negative consequences.

9. Conclusion

The findings of this study highlight the potential negative impacts of SNS addiction on the health and well-being of university students in Western Odisha. The significant positive correlation between SNS addiction and BMI status indicates that excessive use of social media can lead to an increased BMI, which can contribute to several health problems. Furthermore, the substantial gender disparities observed in BMI, the quantity of SNS accounts, and health problems imply that gender exerts a notable influence on the connection between social media addiction and health complications among university students. The results of this study can be useful for healthcare professionals, educators, and policymakers to develop interventions to prevent SNS addiction and its negative effects on the health and well-being of university students.

To summarize, this study adds to the existing literature examining the intricate interplay between social media addiction, gender, BMI, and health problems. Further investigations are warranted to gain a comprehensive understanding of the complex associations among these variables and to formulate efficacious interventions aimed at averting SNS addiction and mitigating its adverse impact on the health and well-being of university students in Western Odisha.

References

1. Alzahrani, H. A., Alotaibi, M. M., Almatrafi, M. T., Alharbi, S. S., & Albalawi, R. S. (2020). Social media addiction among university students and its correlation with body mass index. *International Journal of Adolescent Medicine and Health*, 32(6), 1-5.
2. Behera, D. K., & Gartia, R. (2023). *Addictiveness of social networking sites among students: in the globalized world*.
3. Behera, D. K., Gartia, Dr. R., Sahoo, Dr. R. K., Munda, S., & Sahu, P. (2023). A statistical analysis of the effect of social networking sites on students' academic performance in the western Odisha universities. *Journal of Mathematical Problems, Equations and Statistics*, 4(1), 05–09. <https://doi.org/10.22271/math.2023.v4.i1a.74>
4. Behera, D. K., Gartia, R., & Pachori, H. (2022). Effects of social networking sites on students' psychosomatic health in western Odisha universities during covid-19 pandemic: a statistical analysis. *Indian Journal of Health Social Work*, 4, 1.
5. Behera, D. K., Gartia, R., Sahoo, R. K., Munda, S., & Sahu, P. (2022). A statistical investigation of the impact of social networking sites on students' academic achievement in western Odisha universities. <https://doi.org/10.22271/math.2022.v7.i6a.893>
6. Chen, X., Li, Y., Li, L., & Wang, J. (2017). The association between social media addiction and academic performance among Chinese college students. *Journal of Behavioral Addictions*, 6(2), 179-191. <https://doi.org/10.1556/2006.6.2017.024>
7. Ferguson, C. J. (2017). Everything in moderation: Moderate use of screens unassociated with child behavior problems. *Psychiatric Quarterly*, 88(4), 797-805. <https://doi.org/10.1007/s11126-017-9535-6>
8. Kumar Swain, R., & Pati, A. K. (2021). Use of social networking sites (SNSs) and its repercussions on sleep quality, psychosocial behavior, academic performance and circadian rhythm of humans—a brief review. *Biological Rhythm Research*, 52(8), 1139-1178.

9. Kuss, D. J., & Griffiths, M. D. (2017). Social Networking Sites and Addiction: Ten Lessons Learned. *International Journal of Environmental Research and Public Health*, 14(3), 311.
10. Liu, Q., Li, S., & Gan, Y. (2018). The Relationship Between Social Media Addiction, Depression, and Mental Health among College Students. *Journal of Mental Health*, 27(6), 595-602.
11. Lopez-Fernandez, O., Männikkö, N., Kääriäinen, M., Griffiths, M. D., & Kuss, D. J. (2018). Mobile gaming and problematic smartphone use: A comparative study between Belgium and Finland. *Journal of Behavioral Addictions*, 7(1), 88-99. <https://doi.org/10.1556/2006.7.2018.19>
12. Mishra, J., Samanta, P., Panigrahi, A., Dash, K., Behera, M. R., & Das, R. (2021). Mental health status, coping strategies during Covid-19 pandemic among undergraduate students of healthcare profession. *International journal of mental health and addiction*, 1-13.
13. Nalwa, K., & Anand, A. P. (2013). Internet Addiction in Students: A Cause of Concern. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 7(3), article 8.
14. Sahu, M., Sakhamuri, S., & Kar, S. (2020). Smartphone Addiction among Indian Adolescents: An Exploratory Study. *International Journal of Adolescent Medicine and Health*, 34(2), 1-8.
15. Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior*, 29(6), 2632-2639. <https://doi.org/10.1016/j.chb.2013.07.003>
16. Shaw, M., & Black, D. W. (2008). Internet addiction: Definition, assessment, epidemiology and clinical management. *CNS Drugs*, 22(5), 353-365. <https://doi.org/10.2165/00023210-200822050-00001>
17. Singh, S. (2017). Social media addiction: An overview. *International Journal of Information Management*, 37(3), 219-225. <https://doi.org/10.1016/j.ijinfomgt.2017.01.001>
18. SPSS Statistics. (n.d.). SPSS Statistics: Data Analysis Tools for Statistical Research. Retrieved from <https://www.ibm.com/products/spss-statistics>
19. Wang, J. L., Jackson, L. A., Zhang, D. J., & Su, Z. Q. (2014). The relationships among the Big Five Personality factors, self-esteem, narcissism, and sensation-seeking to Chinese University students' uses of social networking sites (SNSs). *Computers in Human Behavior*, 31, 356-363. <https://doi.org/10.1016/j.chb.2013.05.026>
20. World Health Organization. (2018). Body Mass Index - BMI. Retrieved from [https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/body-mass-index-\(bmi\)](https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/body-mass-index-(bmi))

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