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A Study on Relationship between Lifestyle Factors and Health Outcomes among Students

Swaranjali Karande[1], Vijay Koshti[2], Annasaheb Suryawanshi[3], Ganesh Satpute[4], Shital Patil[5], Snehal Zarekar [6]

[1] *B.Sc. III Student, Department of Statistics, Padmabhushan Vasantraodada Patil Mahavidyalaya, Kavathe Mahankal, Maharashtra, India*
[2]*Associate Professor, Department of Statistics, Padmabhushan Vasantraodada Patil Mahavidyalaya, Kavathe Mahankal, Maharashtra, India*
[3,4,5,6] *Assistant Professor, Department of Statistics, Padmabhushan Vasantraodada Patil Mahavidyalaya, Kavathe Mahankal, Maharashtra, India*

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Corresponding Author:
Swaranjali Karande

Abstract:

This study examines how major lifestyle factors such as diet, sleep, physical activity, screen time, and substance use affect student's physical and mental health, including BMI, stress, anxiety, depression, and academic performance. Using a cross-sectional survey of 100 college students, statistical analyses such as correlation, chi-square, and regression were performed. Results showed that good diet and regular physical activity were associated with healthier BMI and lower depression and anxiety. Screen time emerged as the strongest predictor of poor mental health, significantly increasing both depression and anxiety levels. Sleep duration influenced BMI but had no significant effect on psychological outcomes. Chi-square tests revealed that alcohol use and smoking were significantly associated with academic performance, with non-users performing better academically. Regression analysis confirmed screen time, physical activity, and sleep hours as key predictors of depression. Overall, the study highlights that healthier lifestyle behaviors are essential for improving student's physical well-being, mental health, and academic outcomes.

Keywords: Lifestyle factor, BMI, Stress, Depression, Correlation, Chi-square, Regression

1. Introduction

Student's lifestyle choices have a profound impact on their health and academic performance. With increasing academic pressure, digital exposure, and changes in diet and sleep patterns, students face multiple challenges that affect both physical and mental well-being. This study seeks to understand the relationship between lifestyle factors such as diet, sleep, physical activity, stress, and screen time, and their effect on health outcomes including BMI, self-reported health, stress levels, anxiety, depression and academic performance among students.

Students today are experiencing rapid lifestyle transitions influenced by academic demands, technological advancements, and changing social environments. As academic pressure intensifies, many students adopt irregular routines that include unhealthy eating habits, inadequate sleep, reduced physical activity, and prolonged screen exposure. These lifestyle behaviors can significantly shape both their physical and mental health, directly affecting their academic performance and overall quality

of life. Modern student life is characterized by increased reliance on digital devices for learning, entertainment, and social interaction. While technology facilitates academic growth, excessive screen time contributes to sedentary behavior, disturbed sleep cycles, eye strain, and heightened psychological stress. Likewise, unhealthy dietary patterns such as skipping meals, consuming fast food, and irregular eating can lead to poor nutritional status, weight fluctuations, and lower immunity. Physical inactivity further exacerbates these issues, increasing the risk of obesity, fatigue, and reduced cognitive functioning.

Mental health concerns among students are also rising, with stress, anxiety, and depression becoming increasingly common. Academic pressure, social comparison, and lifestyle imbalance all contribute to psychological distress. Sleep deprivation, excessive screen exposure, and poor diet have been consistently linked with heightened mental health issues. Additionally, substance use such as alcohol and smoking may develop as a coping mechanism for stress but can negatively affect academic focus, motivation, and performance.

Understanding how these lifestyle factors interact and contribute to health outcomes is essential for designing effective interventions. This study aims to explore the relationship between students' lifestyle habits (diet, sleep, physical activity, screen time, and substance use) and their health outcomes, including BMI, self-reported health, depression, anxiety, and academic performance. By identifying key predictors of poor health and academic challenges, the study provides valuable insight into promoting healthier lifestyle behaviors among students. This research is crucial for educational institutions, policymakers, and healthcare professionals seeking to support student well-being and enhance academic success.

The present research is driven by three primary research questions: the first examines the relationship between lifestyle factors and students health outcomes; the second explores the association between substance use, particularly alcohol consumption and smoking, and students academic performance; and the third investigates the impact of screen time on students' mental well-being. These questions aim to provide a comprehensive understanding of how daily habits, risk behaviours, and digital exposure contribute to students physical, psychological, and academic outcomes.

2. Literature Review

The mental health and overall well-being of university students have emerged as critical global concerns, with research consistently demonstrating the influence of lifestyle, psychosocial factors, and academic pressures on student health outcomes. Physical activity has been shown to play a significant role in supporting academic achievement and psychological well-being. Ansari and Stock (2014) found that university students who met recommended physical activity guidelines exhibited better academic performance, highlighting the cognitive and emotional benefits of active lifestyles. Similarly, Li and Guo (2023) reported that physical activity is strongly associated with improved sleep quality, psychological resilience, and positive social adaptation among Chinese college students, emphasizing its role in strengthening mental health.

High rates of depression, anxiety, and stress among students are repeatedly documented. Agyapong-Opoku et al. (2023), in a comprehensive review, showed that depression and anxiety are prevalent among undergraduate health science students due to academic workload, exposure to clinical settings, and psychosocial stressors. Dahlin et al. (2005) earlier observed similar patterns among medical students, noting that excessive stress and depressive symptoms were directly linked to academic pressures and emotional fatigue. Mofatteh (2020) expanded on this by identifying major risk factors such as academic demands, financial difficulties, lack of sleep, and social isolation. During and beyond the COVID-19 pandemic, these stressors intensified. Kavvadas et al. (2023) reported persistently high levels of stress, anxiety, and depression even three years after the pandemic began, reflecting long-term psychological effects on students' emotional health.

The broader literature also highlights the impact of environmental and social stressors. Brandt et al. (2022) found that social isolation, discrimination, and chronic stress significantly deteriorate mental health, contributing to mood disorders and long-term psychological vulnerability among young adults. Quality of life is another dimension influenced by mental health. Fernandes et al. (2023), through a meta-analysis, demonstrated that depression significantly reduces students' overall quality of life, affecting physical, psychological, and social domains. Body mass index (BMI) has also been linked to perceived well-being; Laxy et al. (2017) observed that BMI is significantly associated with health-related quality of life and varies across sex, age, and ethnic groups, suggesting that physical health and body perceptions indirectly shape mental and emotional wellness.

Lastly, cognitive and behavioral factors play a role in mental health outcomes. Zawawi and Hamaideh (2009) found that depressive symptoms among Jordanian students were related to locus of control and life satisfaction. Students with an external locus of control experienced higher depression levels, indicating that personal beliefs and perceptions of control influence emotional responses to stress. Collectively, these studies reveal that student mental health is shaped by a complex interplay of lifestyle behaviors (physical activity, sleep), psychosocial factors (resilience, locus of control, discrimination), academic pressures, and broader environmental influences. The literature strongly suggests the need for integrated university-level interventions targeting physical activity promotion, psychological support, and social well-being to enhance students' academic and life outcomes.

3. Methodology

The present study adopted a cross-sectional survey-based design and was conducted among 100 college students living in Kavathe Mahankal city. Data were collected using a structured questionnaire that assessed various lifestyle habits and health-related outcomes. The study employed statistical techniques such as correlation and regression analysis to examine the relationships between lifestyle factors and health indicators, and the statistical analyses were performed using SPSS software.

4. Objectives

i. To assess lifestyle habits (diet, sleep, physical activity, screen time, Substance use) among students.
ii. To evaluate health outcomes such as BMI, stress levels, anxiety, depression and academic performance.
iii. To analyze the relationship between lifestyle factors and health outcomes.
iv. To suggest recommendations for improving student lifestyle and health.

5. Hypotheses

a. Hypotheses for correlation

H_0: There is no significant relationship between lifestyle factors and Health Outcomes among students. Vs.
H_1: There is significant relationship between lifestyle factors and Health Outcomes among students

b. Hypotheses for Chi-Square test

H_0: Academic Performance Substance used by students are independent Vs
H_1: Academic Performance Substance used by students are dependent

6. Statistical Analysis

This study indicate that, most students are concentrated in the Good (33%) and Fair (26%) categories, reflecting moderate achievement overall. A considerable proportion of students (23%) are in the Poor category, suggesting a need for academic support and improvement strategies. Very few students achieved excellent performance (7%), highlighting the importance of identifying and promoting factors that contribute to higher academic success which is shown in Figure 6.1.

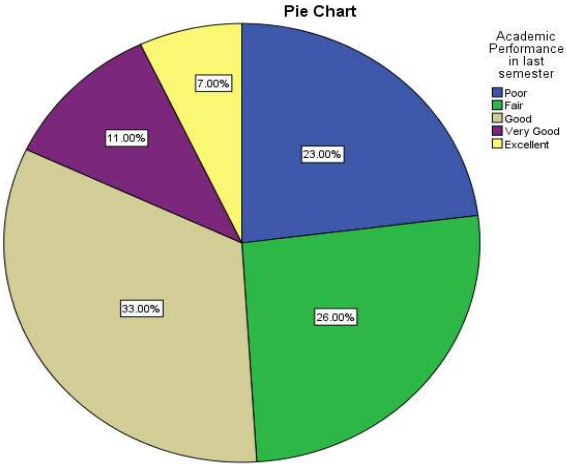

Figure 6.1

Female students have a higher proportion in the Poor category compared to males. Male students perform better overall in higher categories (Very Good and Excellent). Both genders are almost equal in the Good performance category, which seems to be the most common academic level. This suggests that while females struggle slightly more at the lower end, males are more represented in the top-performing groups which are shown in Figure 6.2.

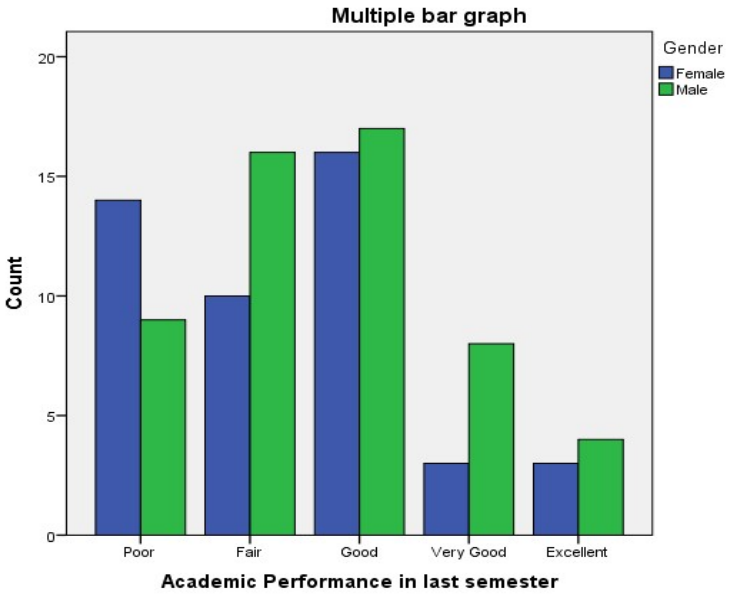

Figure 6.2

6.1 Correlation analysis

The correlation between Lifestyle factors (such as Diet Score, Physical Activity, Average Sleep Hours, Screen Time) and Health outcomes (such as BMI, depression score, anxiety score) are shown in Table 6.1.

Table 6.1: Correlation

		Diet Score	Physical Activity (Days/week)	Average Sleep Hours	Screen Time (hours/day)
BMI	Pearson Correlation	0.776**	-0.295**	0.409**	0.149
	Sig. (2-tailed)	0.000	0.003	0.000	0.140
Depression Score	Pearson Correlation	0.340**	-0.398**	0.177	0.681**
	Sig. (2-tailed)	0.001	0.000	0.078	0.000
Anxiety score	Pearson Correlation	0.206*	-0.213*	0.164	0.544**
	Sig. (2-tailed)	0.040	0.034	0.104	0.000
	N	100	100	100	100

***. Correlation is significant at the 0.01 level (2-tailed).* **. Correlation is significant at the 0.05 level (2-tailed).*

Interpretation of correlation results:

i. Correlation between Lifestyle factors and BMI

- Diet score shows a strong positive correlation with BMI ($r = .776$, $p < .01$), suggesting that healthier dietary habits are associated with healthier BMI values.
- Physical activity has a weak negative correlation with BMI ($r = –.295$, $p < .01$), meaning more frequent exercise is linked to lower BMI.
- Sleep hours show a weak positive correlation with BMI ($r = .409$, $p < .01$), implying adequate sleep is associated with healthier BMI.
- Screen time has no significant correlation with BMI ($p = .140$).

ii. Correlation between Lifestyle factors and Depression Score

- Diet score is positively correlated ($r = .340$, $p < .01$), suggesting poor diet is associated with higher depression levels.
- Physical activity is negatively correlated ($r = –.398$, $p < .01$), meaning more activity reduces depression symptoms.
- Sleep hours show no significant correlation ($p = .078$).
- Screen time shows a strong positive correlation ($r = .681$, $p < .01$), indicating high screen exposure increases depression risk.

iii. Correlation between Lifestyle factors and Anxiety Score

- Diet score has a weak positive correlation ($r = .206$, $p < .05$), showing diet influences anxiety but not strongly.
- Physical activity is negatively correlated ($r = –.213$, $p < .05$), suggesting exercise helps lower anxiety.
- Sleep hours have no significant effect ($p = .104$).
- Screen time is strongly and positively correlated ($r = .544$, $p < .01$), meaning excessive screen use increases anxiety.

6.2 Person Chi-square test

The Person Chi-square test is used to test whether there is statistically significant association between Lifestyle factors (alcohol use/smoking status) and Academic Performance. The Chi-square value and corresponding p-value between Lifestyle factors (alcohol use/smoking status) and Academic Performance is given in Table 6.2.

Table 6.2: Chi-square

		Academic Performance in last semester					Chi-Square	df	P-value
		Poor	Fair	Good	Very Good	Excellent			
Alcohol use	Never	7	18	19	7	6	21.541	12	0.043
	Occasionally	12	6	7	4	0			
	Monthly	4	2	5	0	0			

	Weekly	0	0	2	0	1			
Smoking Status	Never	8	20	28	7	5	18.266	8	0.019
	Occasionally	10	5	4	3	1			
	Regular	5	1	1	1	1			
Total		23	26	33	11	7			

Interpretation of Chi-square test results:

a) Chi-square test between Alcohol Use and Academic Performance

The Chi-square test statistic value is 21.541 (i.e. $\chi^2(12) = 21.541$) and corresponding P-value is 0.043. Since $p < 0.05$, there is a statistically significant association between alcohol consumption and students academic performance in last semester. Students who reported "Never" using alcohol had higher counts in "Fair" and "Good" categories compared to those who consumed alcohol more frequently.

b) Chi-square test between Smoking Status and Academic Performance

The Chi-square test statistic value is 18.266 (i.e. $\chi^2(8) = 18.266$), and corresponding P-value is 0.019. Since, $p < 0.05$, there is a statistically significant association between smoking habit and students academic performance in last semester. Students who "Never" smoked were more represented in the "Good" performance group compared to occasional or regular smokers.

6.3 Multiple regression to predict depression score (Stepwise method):

The stepwise multiple regression model identifies the most significant predictors of depression score among the lifestyle factors. Stepwise regression automatically selects predictors based on statistical criteria. At each step: The most significant variable (lowest p-value) enters first, Non-significant variables are removed and the final model contains only predictors that significantly explain depression score. The coefficient Table 6.2 (using SPSS software), the final regression model (Model 3) retained only those predictors that significantly explain depression score.

Table 6.2: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.512	1.105		5.891	.000
	Screen Time (hours/day)	3.193	.347	.681	9.202	.000
2	(Constant)	9.473	1.492		6.348	.000
	Screen Time (hours/day)	2.893	.351	.617	8.232	.000
	Physical Activity (Days/week)	-.588	.207	-.213	-2.840	.005
3	(Constant)	5.444	2.368		2.299	.024
	Screen Time (hours/day)	2.862	.345	.610	8.292	.000
	Physical Activity (Days/week)	-.592	.203	-.214	-2.913	.004
	Average Sleep Hours	.620	.286	.152	2.165	.033

The stepwise multiple regression analysis identified three significant lifestyle predictors of depression score among students. In Model 1, screen time alone significantly predicted depression ($B = 3.193$, $p < .001$), indicating that higher daily screen exposure is strongly associated with increased depressive symptoms.

In Model 2, physical activity was added, producing a significant improvement in the model. Screen time remained a strong positive predictor ($B = 2.893$, $p < .001$), while physical activity emerged as a significant negative predictor ($B = -0.588$, $p = .005$), suggesting that students who engage in more frequent physical activity tend to report lower depression levels.

The final model (Model 3), average sleep hours was included as an additional significant predictor. Screen time continued to be the strongest predictor ($B = 2.862$, $p < .001$). Physical activity

remained negatively associated with depression (B = -0.592, p = .004), and average sleep hours showed a small but significant positive relationship (B = 0.620, p = .033). This indicates that increased sleep hours were associated with slightly higher depression scores, possibly reflecting oversleeping or poor sleep quality among students with higher depressive symptoms. Overall, the final model demonstrates that screen time, physical activity, and sleep duration together significantly predict depression scores, with screen time being the dominant factor. These findings highlight that excessive screen use and reduced physical activity substantially contribute to increased depressive symptoms, while sleep patterns also play a meaningful role. The final model is,

Depression Score = 5.444 + 2.862*Screen Time - 0.592*Physical Activity + 0.620 * Average Sleep Hour

7. Conclusions

Healthy lifestyle habits including a nutritious diet, regular physical activity, adequate sleep, and limited screen time are significantly associated with improved health outcomes among students. Diet quality shows a strong relationship with healthier BMI and moderate links to lower depression and anxiety, while physical activity demonstrates protective effects by being associated with reduced BMI, depression, and anxiety. Screen time emerges as the strongest predictor of poor mental health, with higher usage strongly related to increased depression and anxiety levels. Although sleep duration is positively related to healthier BMI, it does not show a significant association with depression or anxiety. Additionally, the findings reveal that alcohol and smoking habits are significantly linked to academic performance, with students who abstain from these substances achieving better academic results than those who frequently engage in them. Overall, the results suggest that lifestyle behaviors including diet, physical activity, screen exposure, sleep patterns, and substance use play a crucial role in shaping both the health and academic success of students.

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