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# Habits and Health: Understanding the Role of Daily Lifestyle Pattern

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**Abstract:** *Lifestyle habits play a crucial role in an individual's overall health and well-being. This study examines the relationship between selected daily lifestyle patterns and their effect on personal health. Data were collected through a structured survey that included questions related to physical activity, eating habits, screen time, sleep patterns and environmental conditions. Graphical analysis was used to explore patterns such as the relationship between exercise habits and Body Mass Index (BMI), screen time and difficulty in concentration, eating trends across family types (joint and nuclear) and food choices. To examine associations between categorical variables, Chi-square tests of independence were applied to analyse relationships between screen-time and time taken for sleep, as well as physical activity and concentration levels. Differences in exercise habits between males and females were analysed using the Mann–Whitney U test, while variations in sleep duration across different age groups were examined using the Kruskal Wallis test. The results provide insights into how lifestyle behaviours and daily routines are associated with health-related outcomes. The findings highlight the importance of balanced habits such as regular physical activity, healthy eating, and adequate sleep in promoting better overall health.*

**Keywords:** Lifestyle patterns, Body Mass Index (BMI), eating trends, concentration levels, sleep duration.

## I. INTRODUCTION

In recent years, lifestyle habits have become an important factor of personal health and well-being. Daily behaviours such as eating patterns, physical activity, sleep duration, and screen time significantly influence both physical and mental health. Rapid tech growth and changing social structures have changed traditional lifestyles, leading to increased lazy behaviour, irregular sleep schedules, and higher consumption of junk foods. These changes have raised concerns about their long-term impact on health outcomes. Understanding how daily lifestyle patterns affect health is therefore an important area of study. While medical factors contribute to health conditions, everyday habits often play an equally significant role in determining an individual's overall well-being. Factors such as exercise frequency, diet quality, and digital screen exposure can influence body weight, energy levels, sleep quality, and mental ability.

This study aims to explore the relationship between selected lifestyle habits and health-related indicators using survey data collected from individuals. The prevalence of overweight and obesity has increased dramatically during last 3 decades with devastating consequences to public health [1]. Here we want to study how physical activity influence individual's health. Also how the increased screen time affect the concentration levels of an individual. Further, we investigate the dining out trend in different family types [2]. Investigate the choice of food made by respondents based on the criteria like taste, health and convenience. Statistical analysis includes chi square tests to examine the association between variables like screen time, sleep difficulty, physical activity and concentration level [3]. For some non-normal data the non-parametric test such as Mann Whitney U test [4] and Kruskal Wallis test are used to investigate the relationship between ordinal variables [5,6].

By examining these relationships, the study aims to provide insights into how everyday habits contribute to health patterns and well-being. The findings may help highlight the importance of balanced lifestyle practices and encourage greater awareness of how daily routines influence personal health.


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## II. METHODOLOGY

This study is based on primary data collected through a questionnaire survey designed to understand the relationship between daily lifestyle habits and personal health indicators. The questionnaire included questions related to food habits, physical activity, screen time, sleep patterns, family environment, and general health conditions. The survey was applied to individuals belonging to different age groups and family types in order to capture different lifestyle patterns. The unit of analysis for this study was the individual respondent. Participation in the survey was voluntary and respondents were informed that their responses would be used strictly for academic and research purposes. No personally noticeable information was collected, ensuring the privacy of all participants.

The study examined various lifestyle and health-related variables. Key variables included: Exercise habits (frequency of physical activity), Body Mass Index (BMI), Screen time (daily time spent using digital devices), Difficulty in concentration, Sleep duration and time taken for sleep, Food choices and food habits and Family type (nuclear or joint family). These variables were used to examine associations between lifestyle behaviours and health-related outcomes. The graphical analysis is used for the comparison of various variables with individual's health. The grouped bar charts are used to show number of individuals by BMI category and exercise frequency [1] and number of individuals by screen time and concentration level [7]. Also, the pie charts are used to show eating out trends across family types [2] and food choice preferences among respondents. Further Chi square test is also used to investigate the association between screen time and sleep difficulty and physical activity and difficulty in concentration [3].

For the non-parametric analysis, Mann Whitney U test and Kruskal Wallis H test are used. In Mann Whitney U test, we wanted investigate how exercising habits are different among males and females [4]. For this purpose, we carried of gender wise comparison by giving the rank to these two different distribution of male and female and investigate how the exercising habit differ in both. Typically, aging is associated with decreases in the amount of slow wave sleep and increases in stage 1 and 2 non–rapid eye movement sleep, often attributed to an increased number of spontaneous arousals that occur in the elderly [6]. For this purpose we conducted Kruskal Wallis H test for age wise comparison of sleep duration [5]. We divided the data into age wise groups and then calculated the frequency of sleep duration among these groups and the provided the ranks to these frequencies. After providing the ranks calculated the sum of the ranks and then calculated the H statistics for comparing it with chi square statistics and give the result [5,6].

## III. GRAPHICAL ANALYSIS

Initial exploration of the data was conducted using graphical representations to visualize patterns and relationships between variables. The following comparisons were illustrated using charts:

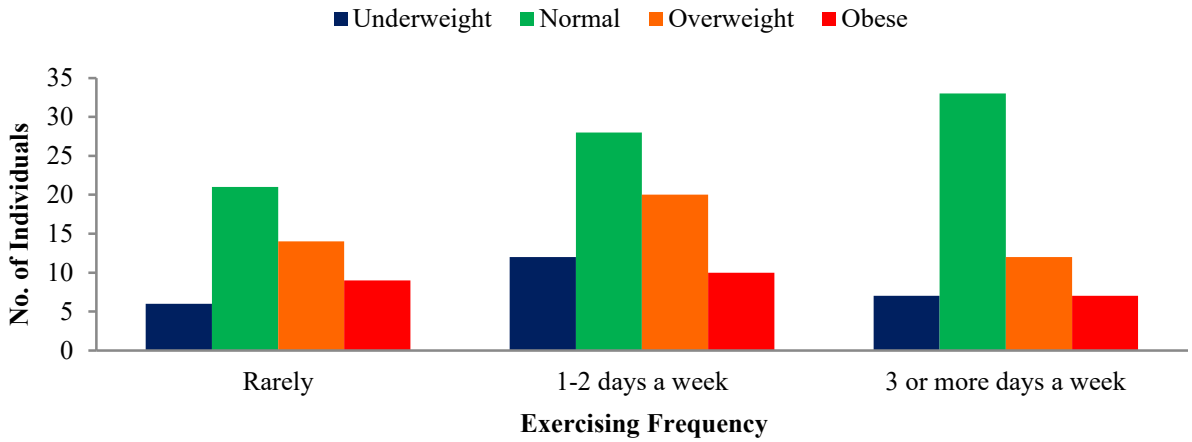


**Fig.1 Grouped bar chart of number of individuals by BMI category and exercise frequency.**

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Fig.1 shows the relationship between exercise frequency and body weight status. Individuals with normal weight are the highest in all exercise categories, especially among those exercising 3 or more days per week. The number of overweight and obese individuals decreases as exercise frequency increases. This suggests that regular physical activity is associated with healthier body weight.

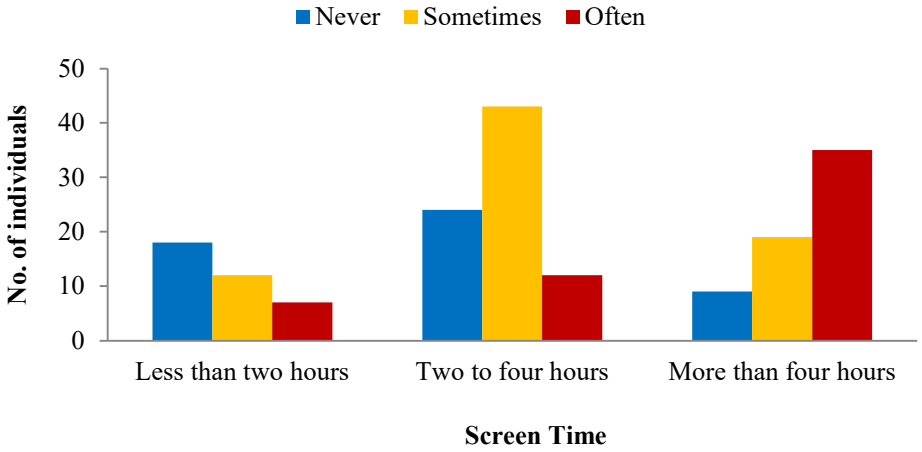


**Fig.2 Grouped bar chart of number of individuals by screen time and concentration level.**

Fig. 2 shows the relationship between screen time and the frequency of difficulty in concentration (never, sometimes, and often). Most individuals who spend two to four hours on screens report the behaviour sometimes. Those with more than four hours of screen time show the highest number of individuals who often engage in the behaviour. This suggests that higher screen time may affect concentration level.

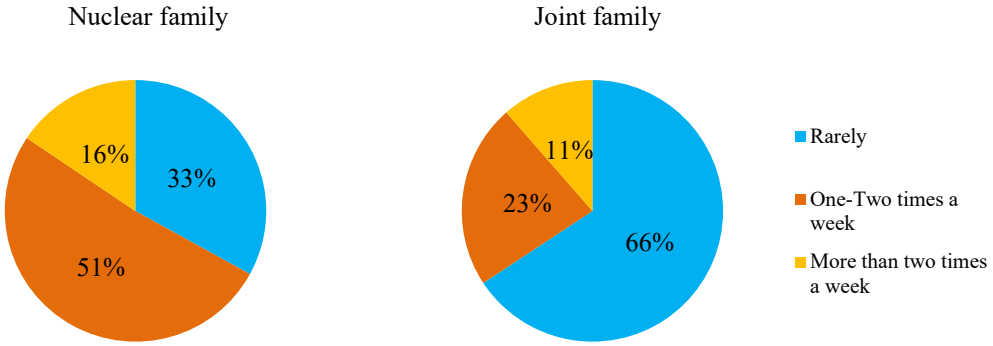


**Fig.3 Pie chart of eating out trends nuclear and joint family.**

Fig. 3 show a clear difference in dining-out frequency between the two family types. The nuclear family, shows higher dining-out frequency, with 51% eating out one–two times a week and 16% more than twice a week, while only 33% rarely dine out. In joint family majority of respondents (66%) rarely dine out, while only 23% eat out one–two times a week and 11% more than twice a week. Overall, the nuclear family type tends to dine out more frequently than the joint family type.


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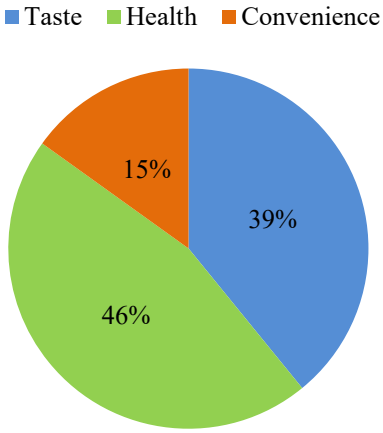


**Fig.4 Pie chart showing consumer preferences in food selection.**

Fig. 4 shows the main factors influencing respondents' food choices. Health is the most important factor for 46% of respondents, followed by taste at 39%. Convenience is the least influential factor, accounting for only 15%. This indicates that most people prioritize health benefits and taste over convenience when selecting food.

## IV. STATISTICAL ANALYSIS

**Chi-Square Test of Independence:**

The Chi-square test of independence was used to examine associations between categorical variables.

The relationship between screen time and latency in sleep

**Hypothesis:**

$H_0$: Screen time and Sleep difficulty are independent.

V/s

$H_1$: Screen time and Sleep difficulty are not independent (dependent).

Contingency Table:

**TABLE I**

| Sleep Duration | Time taken for Sleep | | | |
|---|---|---|---|---|
| | Immediately | 15-30 minutes | More than 30 minutes | TOTAL |
| Less than 2 hours | 15 | 13 | 9 | 37 |
| 2-4 hours | 23 | 41 | 15 | 79 |
| More than 4 hours | 23 | 33 | 7 | 63 |

**Test Statistic:**

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

$\chi^2 = 5.4536$

$\chi^2_{(0.05,4)} = 9.4880$

Here, $\chi^2_{(0.05,4)} > \chi^2$

We accept $H_0$ at 5% level of significance with 4 degrees of freedom.

**Conclusion:** Sleep difficulty independent of screen time. There are some other factors influencing the time taken for sleep by individuals.

The relationship between physical activity and concentration levels

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**Hypothesis:**

$H_0$: Physical activity and Concentration are independent.

V/s

$H_1$: Physical activity and Concentration are not independent (dependent).

Contingency Table:

**TABLE II**

| Exercising Frequency | Lack of Concentration | | | |
|---|---|---|---|---|
| | Never | Sometimes | Often | TOTAL |
| Rarely | 16 | 23 | 11 | 50 |
| One to two days a week | 21 | 32 | 17 | 70 |
| Three or more days a week | 14 | 19 | 26 | 59 |
| TOTAL | 51 | 74 | 54 | 179 |

**Test Statistic:**

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

$\chi^2 = 8.2069$

$\chi^2_{(0.05,4)} = 9.4880$

Here, $\chi^2_{(0.05,4)} > \chi^2$

We accept $H_0$ at 5% level of significance with 4 degrees of freedom.

**Conclusion:** Concentration levels are independent of physical activity. There are some other factors responsible for less concentration level.

**Mann–Whitney U Test:**

The Mann–Whitney U test, used to evaluate differences in exercise habits between male and female respondents.

**Hypothesis:**

$H_0$: F(x) =F(y); Exercising habits in Male and Female are same.

V/s

$H_1$: F(x) ≠ F(y); Exercising habits in Male and Female are not same.

Observation Table:

**TABLE III**

| Gender | Exercising Frequency | | | |
|---|---|---|---|---|
| | Rarely | One to two days a week | Three or more days a week | Total |
| Male | 28 | 29 | 32 | 89 |
| Female | 22 | 41 | 27 | 90 |
| Total | 50 | 70 | 59 | 179 |

**Test Statistics:**

$U_1 = 4248$ and $U_2 = 3762$

U = min ($U_1$, $U_2$)

U = 3762

Since, $n_1$ and $n_2$ are large we use large sample Mann-Whitney U test.

E(U) = 4005 and V(U) = 120150

Therefore,

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$Z = \frac{U - E(U)}{\sqrt{V(U)}}$

Z = -0.7010

Here, $|Z| > Z$

i.e. 1.96 > -0.7010

Therefore, we accept $H_0$ at 5% level of significance.

**Conclusion:** Engagement in physical activity between male and female is same.

**Kruskal Wallis Test**

The Kruskal Wallis test, a non-parametric alternative to one-way ANOVA, was applied to examine differences in sleep duration across different age groups. This test allows comparison of more than two independent groups when the assumption of normality may not hold.

**Hypothesis:**

$H_0$: The distribution of sleep duration is the same across all age groups

v/s

$H_1$: At least one age group has a different distribution of sleep duration compared to others.

**TABLE IV**

| Age | Sleep Duration | | |
|---|---|---|---|
| | Less than 6 hours | 6-8 hours | More than 8 hours |
| 18-24 | 6 | 11 | 3 |
| 25-44 | 10 | 42 | 6 |
| 45-59 | 7 | 32 | 7 |
| 60-75 | 9 | 34 | 12 |
| Total | 32 | 119 | 28 |

**TABLE V**

| | Less than 6 hours | Rank(R1) | 6-8 hours | Rank(R2) | More than 8 hours | Rank(R3) |
|---|---|---|---|---|---|---|
| 18-24 | 6 | 2.5 | 11 | 8 | 3 | 1 |
| 25-44 | 10 | 7 | 42 | 12 | 6 | 2.5 |
| 45-59 | 7 | 4.5 | 32 | 10 | 7 | 4.5 |
| 60-75 | 9 | 6 | 34 | 11 | 12 | 9 |
| $R_i$ | | 20 | | 41 | | 17 |
| $\frac{R_i^2}{n_i}$ | | 100 | | 420.25 | | 72.25 |

**Test Statistics:**

$H = \frac{12}{N(N+1)}\left(\Sigma\frac{Ri^2}{ni} - 3(N+1)\right)$

H = 42.5769

$\chi^2$ = 5.9915

Here, H > $\chi^2$ therefore we reject the null hypothesis.

**Conclusion:** The distribution of sleep among different age group is not same.

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## V. CONCLUSION

The graphical analysis suggests that physical activity is associated with healthier body weight, as individuals who engage in regular exercise tend to fall within healthier BMI categories. The relationship between screen time and concentration indicates that higher screen exposure is associated with increased difficulty in maintaining concentration. The analysis of eating patterns across family types shows that individuals from nuclear families tend to dine outside the home more frequently compared to those from joint families. The results related to food choice preferences suggest that respondents generally prioritize health and taste when selecting food, while convenience appears to be a relatively less influential factor.

The Chi-square test of independence indicates that screen time is not the only reason for difficulty in sleep there might be other factor influencing sleep. Similarly, it also shows that physical activity has no effect on concentration level, implying that no association was observed between these variables in the dataset. The Mann–Whitney U test comparing exercise habits between males and females indicates that there is no significant difference in physical activity engagement between the two groups, implying that there is no relation between exercising habits and gender. Finally, the Kruskal Wallis test shows that sleep duration differs significantly across age groups, indicating that sleep patterns vary among different age categories.

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