E-Report for Demographic Behavioral Data

SCHOOL OF
HEALTH SCIENCES

In collaboration with
Arizona State University®

Demographic and Lifestyle Influences on Health

Introduction to the Dataset

This dataset contains demographic and lifestyle factors, including **smoking status, BMI, physical activity, sex, education, patient satisfaction scores, and health literacy scores.** These variables were selected because they have established associations with health behaviors, outcomes, and perceptions of healthcare quality. The objective was to explore how these lifestyle and demographic factors relate to patient satisfaction and health outcomes.

Methods

To start, data preprocessing was done to handle missing values by replacing them with "Unknown" and selecting relevant variables for analysis. Descriptive statistics were calculated to obtain the mean values for each variable of interest such as BMI, physical activity, sex, education, health literacy, and satisfaction scores. Ending with visualization methods: violin plots, scatter plots, box plots, and bar plots to explore distributions and relationships.

**Key statistical tests conducted were:**

- **Pearson correlation** to examine the relationship between BMI and physical activity.

- **T-test** to compare BMI differences between sexes.

- **ANOVA** to assess satisfaction differences across education levels.

- **Chi-square** test to determine associations between smoking status and satisfaction groups.


Key Results and Figures

1. Distribution of Patient Satisfaction by Smoking Status – A violin plot showed variation in patient satisfaction across smoking categories, highlighting differences among non-smokers, occasional smokers, and chain smokers.

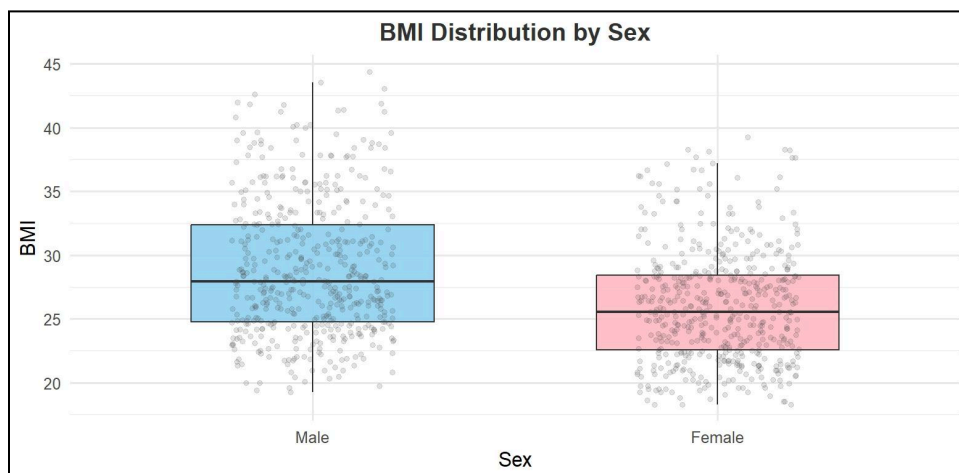**Figure 1:** Violin Plot of Patient Satisfaction by Smoking Statu**s**
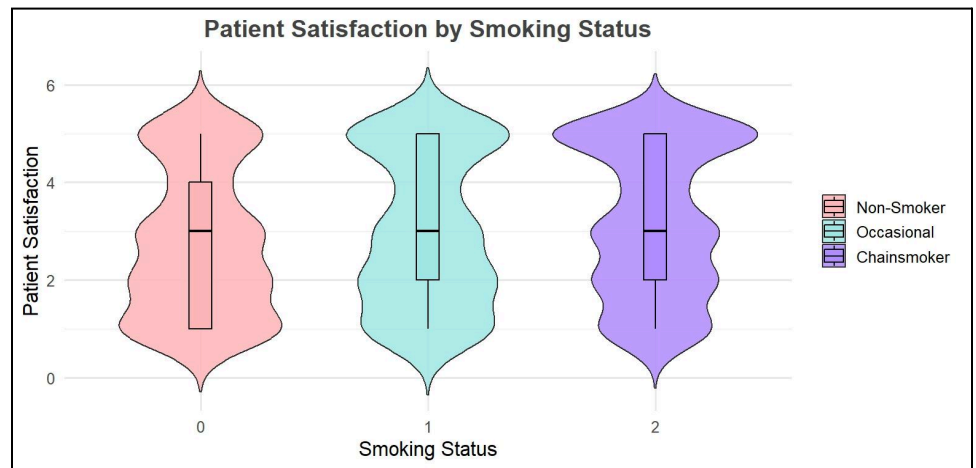
2. Relationship Between Physical Activity and BMI – A scatter plot with a regression line was created to explore if physical activity hours per week correlate with BMI. The Pearson correlation coefficient was approximately 0.02, indicating no significant linear relationship between physical activity and BMI in this dataset.

Figure 2: Scatter Plot of BMI vs Physical Activity Hours per Week
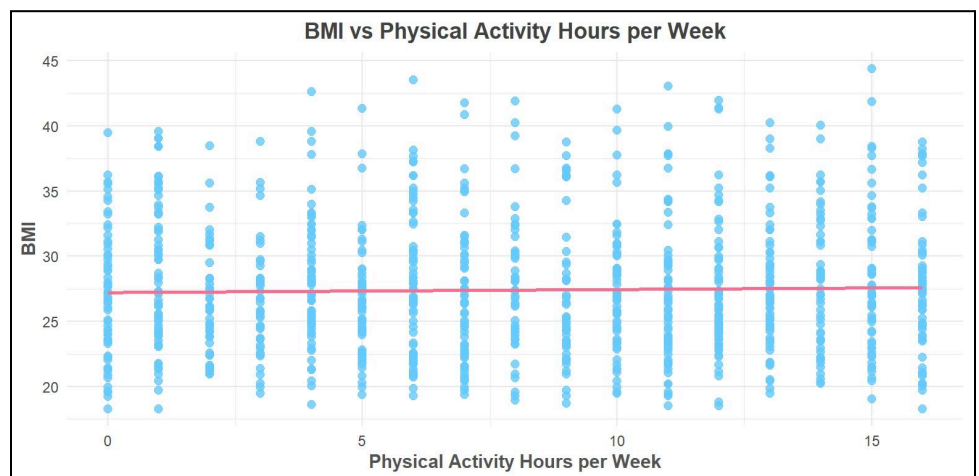
3. BMI Comparison by Sex – Box plots revealed clear differences in BMI distribution between males and females. The t-test confirmed this difference was statistically significant ($p < 0.001$), indicating males and females differ significantly in average BMI.

Figure 3: Box Plot of BMI by Sex

4. Health Literacy and Patient Satisfaction by Education Level – Education levels were categorized from none to tertiary. ANOVA results showed significant differences in satisfaction scores across education groups ($p < 0.001$). Box plots illustrated variation in health literacy and satisfaction with increasing education levels.
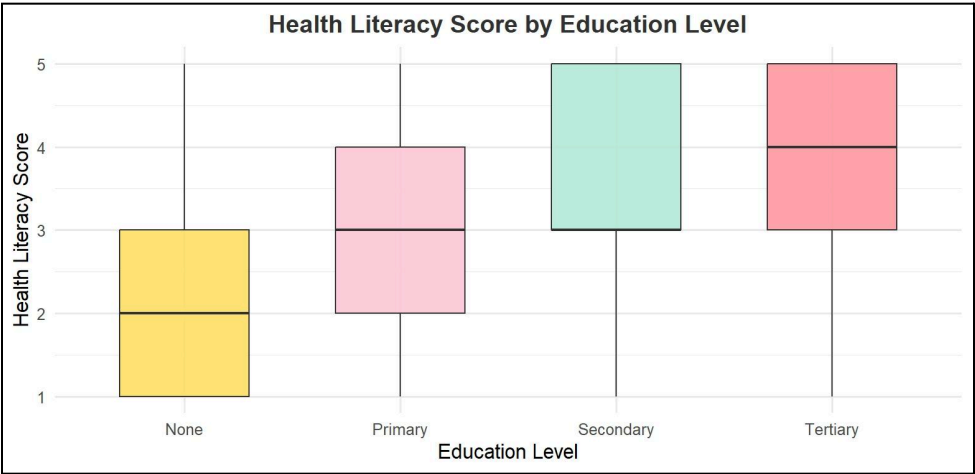
Figure 4: Box Plot of Health Literacy Score by Education Level

I. Interpretation and Brief Conclusion

The analysis suggests that smoking status has a statistically significant correlation with patient satisfaction–indicating that smokers and non-smokers perceive healthcare quality differently. Physical activity, contrast expectations–showing no strong linear association with BMI in this sample, potentially due to other factors influencing it which is not accounted for. Significant BMI differences by sex highlight biological and lifestyle influences on body mass. Lastly, education level plays a crucial role in shaping health literacy and satisfaction with care, emphasizing the importance of educational interventions to improve health outcomes. These findings provide valuable insight into how demographic and lifestyle factors impact patient experiences and health, which can inform targeted healthcare strategies.

   #   Overall, demographic and lifestyle factors contribute differently to health and satisfaction, suggesting multifaceted approaches are needed in healthcare delivery.