



Steven Filby¹, Matthew Rhudy², Praveen Veerabhadrapa¹

1. Department of Kinesiology, The Pennsylvania State University, Berks campus, Reading, PA

2. Department of Mechanical Engineering, The Pennsylvania State University, Berks campus, Reading, PA

Purpose: The purpose of this research is to examine the relationship of vape use on physical activity levels and resting heart rate/blood pressure/saturated oxygen levels.

Hypothesis:

1. Vapers will have lower physical activity and saturated oxygen levels compared to non-vapers
2. Vapers will have higher heart rate and blood pressure compared to non-vapers

Methods:

- Subjects: Twenty-six adults (17 Non-vapers/9 Vapers, 13 male, 13 female, average age 21.24 ± 2.65 years, average Body Mass Index (BMI) 26.20 ± 6.18 kg/m²) from the Berks area that have never smoked traditional cigarettes.
- Health and Social History Questionnaire completed by each participant. Blood pressure (BP), heart rate, saturated oxygen, height, and weight were then assessed using a WelchAllyn ProBP 3400 automated blood pressure cuff and Innovo Finger Pulse Oximeter Inv-430J/PE on the participants non-dominant arm and hand.
- Fitbit Charge HR assigned and distributed to each participant for 168 hours.
- After 168 hours elapsed, the Fitbit was returned and the collected data recorded.

Results: No strong statistical significance was found between any recorded metric and vape status. However, a visual inspection of the data and figures shows a higher average systolic BP, a large proportion of vaping participants exhibiting elevated, stage 1 and 2 hypertension, and a notable difference in certain physical activity metrics in vapers when compared to non-vapers. Vapers, on average, were 83.7% less active than non-vapers and took 76.93% less average steps per day. The following figures illustrate the distributions and percentages of systolic BP and steps.

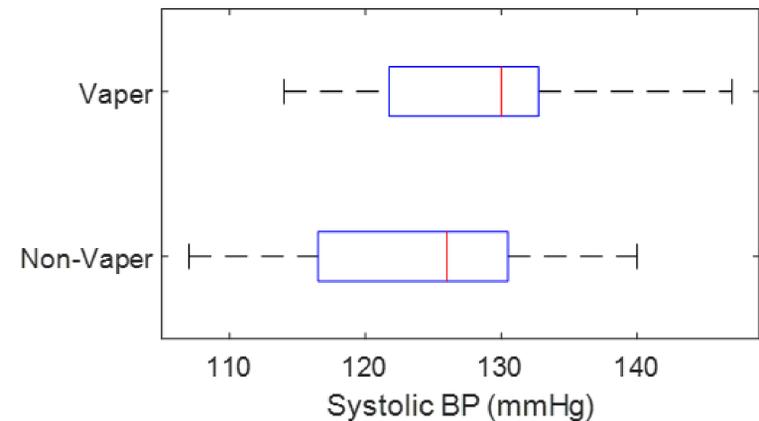


Figure 1: Boxplots illustrating the distribution of Systolic BP for vapers and non-vapers.

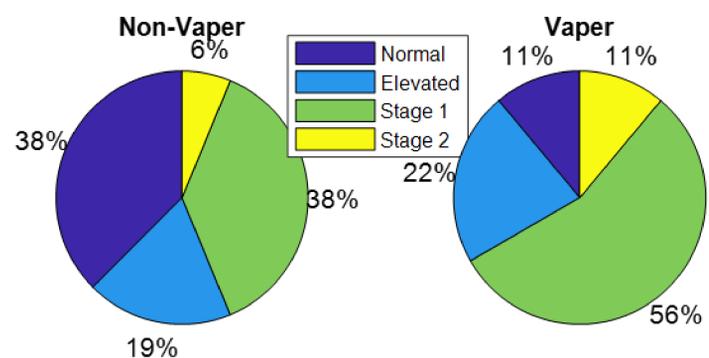


Figure 2: Percentages of BP categories for vapers and non-vapers

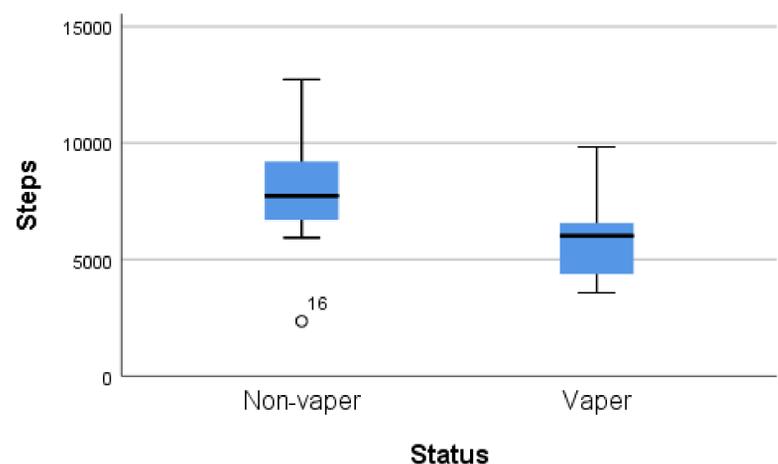


Figure 3: Boxplots illustrating the distribution of steps for vapers and non-vapers.

Conclusion: Despite there being no statistical significance, there is a notable increase in blood pressure of vapers when compared to non-vapers. This elevation in blood pressure may indicate a heightened risk among vapers for cardiovascular, renal, and metabolic diseases.

Future Research: Future research is needed to confirm the trend of this study's results and to establish statistical significance.