

RELATIONSHIP BETWEEN SODIUM AND BLOOD PRESSURE

Hofstra School of Health Sciences, Hempstead, NY
Arpita Hazra MD MPH and Jamila Conliffe MPH



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MASTER OF PUBLIC HEALTH

Summary

This research project analysed the relationship between dietary sodium consumption and blood pressure in adults in the United States. Results, based on correlation and regression analysis, there was no association between dietary sodium intake and systolic BP and diastolic BP in our study population.

Objectives

To determine correlation between sodium consumption and systolic and diastolic Blood Pressure (BP) in adults from 2009 to 2014.

Methods

A cross-sectional study which examined dietary intake of sample population was derived from National Health and Nutrition Examination Survey (NHANES). Study participants were surveyed for sodium intake (in mg/day) and physical examinations were conducted where systolic and diastolic BP were recorded. We used Correlation analysis to quantitatively define the strength of association between continuous variables, sodium consumption versus systolic and diastolic BP. Spearman correlation was used along with regression analysis to express their relationship in the form of an equation.

Table 1. Correlation and regression results for the sodium intake and systolic BP and for sodium intake and diastolic BP in different age groups and females.

Age Group	Correlation Coefficient(rho) between Systolic BP and Sodium Intake	Linear Regression equation (For Systolic BP and Sodium Intake)	Correlation Coefficient(rho)between Diastolic BP and Sodium Intake	Linear Regression equation (For Diastolic BP and Sodium Intake)
18-29	0.7171	Na=105.92+0.00046*sbp (P=0.2730)	0.9566	Na=59.56+0.00029*dbp (P=0.5418)
30-39	0.7291	Na=109.11-0.00011*sbp (P=0.4984)	0.2657	Na=65.12-0.00021*dbp (P=0.2447)
40-49	0.4087	Na=112.81-0.00012*sbp (P=0.6486)	0.6538	Na=70.21-0.000059*dbp (P=0.7860)
50-55	0.6601	Na=123.45-0.00029*sbp (P=0.5404)	0.6232	Na=73.89-0.00046*dbp (P=1.1051)
All	0.4437	Na=114.63-0.00026*sbp (P=0.0737)	0.4566	Na=69.43-0.00019*dbp (P=0.0859)

Table 2. Correlation and regression results for the sodium intake and systolic BP and for sodium intake and diastolic BP in different age groups and Men.

Age Group	Correlation Coefficient(rho) between Systolic BP and Sodium Intake	Linear Regression equation (For Systolic BP and Sodium Intake)	Correlation Coefficient(rho)between Diastolic BP and Sodium Intake	Linear Regression equation (For Diastolic BP and Sodium Intake)
18-29	0.0266	Na=118.06-0.00072*sbp (P=0.0627)	0.8012	Na=62.15-0.00014*dbp (P=0.7422)
30-39	0.3357	Na=117.56-0.000011*sbp (P=0.9388)	0.9467	Na=66.39+0.000036*dbp (P=0.8095)
40-49	0.1898	Na=118.38+0.00033*sbp (P=0.0670)	0.5067	Na=73.17+0.000089*dbp (P=0.5830)
50-55	0.1048	Na=126.94-0.00035*sbp (P=0.2906)	0.5361	Na=76.54-0.00018*dbp (P=0.4369)
All	0.2582	Na=120.41-0.000024*sbp (P=0.8095)	0.7555	Na=71.64+0.000023*dbp (P=0.8019)

Results

On analysing our data the mean sodium intake was 3057.04 mg (std dev 1688.58, IQR 1945) The mean systolic BP was 118.42 mmHg(Std dev 18.36, IQR 22.0) and the mean diastolic BP was 65.78mmHg (Std dev 14.98, IQR 17.33). We analysed the correlation and linear relationships between sodium consumption with systolic BP and sodium consumption with diastolic BP in different age groups for our study sample. The results for the different age groups are listed in table 1 & 2. There was no statistically significant correlation and no significant linear relationship between sodium intake and systolic BP or sodium intake and diastolic BP in both men and women.

Conclusion

Based on the results from this study we can conclude there is no association between dietary sodium intake and systolic BP and diastolic BP. This may be due to the size of our sample, use of medications and the sodium intake was only based on one day. The average daily sodium intake was 3057 milligrams per day however, the recommended daily allowance is 2300 milligrams/day. According to the AHA, excessive amounts of sodium can raise blood pressure and poses significant health risks.

References:

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