

# Is There a Relationship Between BMI and Blood Pressure?

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## Background

- If there is a correlation between the Body Mass Index (BMI) and Blood Pressure (BP), professionals can use this information to educate the population on the effects of BMI on hypertension
- Such information would provide a pathway for the population to counteract the effects of hypertension

## Purpose

- The purpose of this study was to determine if there is a correlation between BMI and BP.

## Literature Review

- Research conducted by Adler, Rosario, Diederichs, & Neuhauser (2015) found "no association of BMI and SBP within the group of untreated participants with hypertension at both times."
- "BMI was significantly associated with SBP only in the lowest quartile of BP" (Adler et al., 2015).
- Research conducted by Dua, Bhuker, Sharma, Dhall, & Kapoor (2014) found that "prevalence of high blood pressure was greater in those with high BMI..."
- "An elevated BMI being associated with prehypertension may suggest that such individuals are at increased risk of progressing to frank hypertension" (Dua et al., 2014).

## Methods

- Participants: The participants of this study included 16 Exercise Science students. Participants included athletes, non-athletes, and non-traditional students (2).
- Instruments: Omron Blood Pressure Cuff, Electronic Weight Scale, Stadiometer, Pre-Test Procedural Email, Test Day Procedural Survey for Participants, Administering Instructions, Pen, and Pencil
- Procedure:
  - The participants were instructed on the protocol of testing blood pressure prior to data collection. Protocol for blood pressure included that they should not consume food, alcohol, nicotine, or caffeine, as well as not participate in exercise 30 minutes prior to testing.
  - A survey to assess pre-testing procedure participation was passed out before testing.
  - A five minute resting period with no talking and feet grounded on the floor, uncrossed was given.
  - After the five minute resting period, blood pressure was taken while ensuring the participant was doing the following: had bare left arm on the table at heart level with his or her palm facing up, was stably sitting with feet placed on the ground, and was staying still until the reading is complete. The blood pressure cuff was positioned at least one inch above the elbow crease.
  - The participant's systolic and diastolic blood pressure was written down, then their cuff was taken off.
  - To collect weight, the participant was asked to take off his or her shoes and to slowly step on the scale. Weight was then recorded.
  - To collect height, the participant was asked to remove his or her shoes and to stand with heels against the instrument. Participants were reminded to stand straight, looking directly in front of them. Height was recorded.

## Results

Participant	BMI	Systolic BP
1	30.93	118
2	22.07	121
3	33.72	136
4	26.74	140
5	28.2	119
6	30.6	133
7	25.81	124
8	33.57	135
9	21.99	130
10	20.21	111
11	39.42	135
12	23.32	126
13	22.44	118
14	33.42	120
15	26.49	141
16	22.28	120

- Mean BMI= 27.57
- Mean Systolic BP = 127
- r-value = 0.45
- A correlation analysis provides an r-value that can help us better understand the relationship between the two constructs of BMI & BP
- The resulting r-value was 0.45
- The resulting R<sup>2</sup> value was 0.20, which lacks explanatory value because it is below 0.5

## Discussion

- This study is useful to gain more information concerning the relationship between BMI and Blood Pressure
- Our research showed that there is a moderate correlation between BMI and BP. Our research indicated the variation in one's BP is not due to his or her BMI.
- More research should be conducted with a larger sample size so that major causative agents of fluctuation in BP can be identified. Non-Exercise Science students should be tested also.

## References

- Adler, C., Rosario, A. S., Diederichs, C., & Neuhauser, H. K. (2015). Change in the association of body mass index and systolic blood pressure in germany - national cross-sectional surveys 1998 and 2008-2011. *BMC Public Health*, 1-10.
- Dua, S., Bhuker, M., Sharma, P., Dhall, M., & Kapoor, S. (2014). Body mass index relates to blood pressure among adults. *North American Journal of Medical Sciences*, 1-10.

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