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## Body Mass Index is a Poor Indicator of Health in Female College Freshmen

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**Learning Objective (Upon completion, participant will be able to...):** Describe the relationship between body mass index and other health markers in female college freshmen.

**Track:** Wellness and Public Health

**Learning Codes:** 4060 exercise, fitness, and sports nutrition; 3030 anthropometrics, body composition; 4040 disease prevention, health promotion

**Background:** College students perceive their health risk to be low. A contributing factor may be that body mass index (BMI) is often used to identify health risk and most college students are in the healthy range. This study's purpose was to assess the relationship between BMI and alternate health markers.

**Methods:** Female college freshmen (n=30, ages 18-19) completed assessments for blood pressure (automated cuff), body fat percentage (bioelectrical impedance analysis), and cardiovascular fitness (recovery pulse following 3-min step test; YMCA protocol) at the beginning and end of their first semester. Paired t-tests were used to evaluate differences across the semester.

**Results:** Participants had BMI in the normal range; this did not change ( $23.4 \pm 4.1$  to  $23.4 \pm 4.2$  kg/m<sup>2</sup>) during the semester. However, body fat percentage increased ( $26.4 \pm 8.0$  to  $27.4 \pm 8.7\%$ ,  $p=.003$ ) over the same time period. Neither systolic nor diastolic blood pressure changed during the semester. However, 60% of participants had blood pressure in the elevated or hypertensive range ( $\geq 120$  and/or  $\geq 80$  mmHg) at both time points. Cardiovascular fitness decreased during the semester (indicated by increased recovery pulse;  $103.1 \pm 24.8$  to  $112.7 \pm 29.1$  beats/min,  $p=.029$ ). Poor or very poor cardiovascular recovery (pulse  $\geq 122$  beats/min) was noted in 26.7% and 40% of participants at the beginning and end of semester, respectively.

**Conclusions:** Despite normal BMI, most participants had an undesirable blood pressure level. Throughout their first semester, undesirable changes in body fat percentage and cardiovascular fitness occurred, suggesting that BMI is not a good predictor of health status in female freshmen.

**Funding Source:** Ohio Department of Higher Education's Transforming Campus Climate Grant; Bowling Green State University Center for Undergraduate Research and Scholarship Grant

# Body Mass Index is a Poor Indicator of Health in Female College Freshmen

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## Abstract

**Background:** College students perceive their health risk to be low. A contributing factor may be that body mass index (BMI) is often used to identify health risk and most college students are in the healthy range. This study's purpose was to assess the relationship between BMI and alternate health markers.

**Methods:** Female college freshmen (n=30, ages 18-19) completed assessments for blood pressure (automated cuff), body fat percentage (bioelectrical impedance analysis), and cardiovascular fitness (recovery pulse following 3-min step test; YMCA protocol) at the beginning and end of their first semester. Paired t-tests were used to evaluate differences across the semester.

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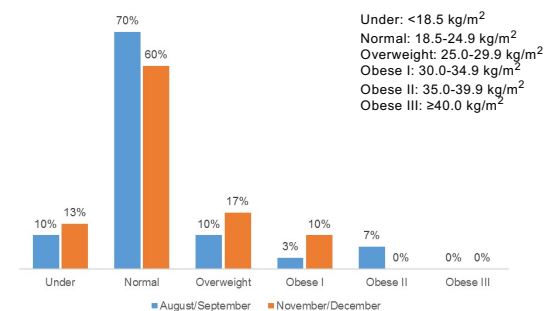
**Conclusions:** Despite normal BMI, most participants had an undesirable blood pressure level. Throughout their first semester, undesirable changes in body fat percentage and cardiovascular fitness occurred, suggesting that BMI is not a good predictor of health status in female freshman.

## Methods and Results

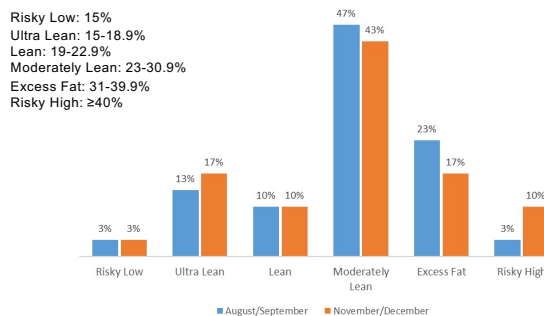
**Table 1.** Participant Characteristics.

	August/September	November/December	p-value
Body Mass Index (kg/m <sup>2</sup> )	23.4±4.1	23.4±4.2	.972
Body Fat (%)	26.4±8.0	27.4±8.7	.003
Systolic Blood Pressure (mmHg)	118.7±12.0	117.0±10.7	.304
Diastolic Blood Pressure (mmHg)	81.0±9.1	82.0±8.2	.579
Cardiovascular Fitness (pulse)	103.1±24.8	112.7±29.1	.029

**Figure 1.** Body Mass Index (BMI) Categories.

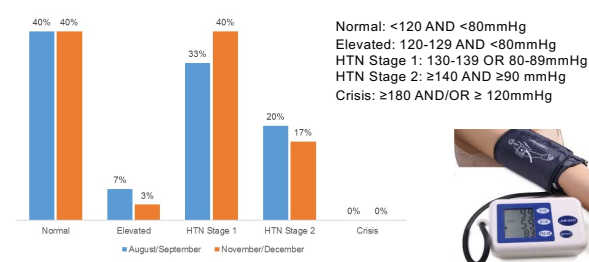


**Figure 2.** Body Fat Categories.

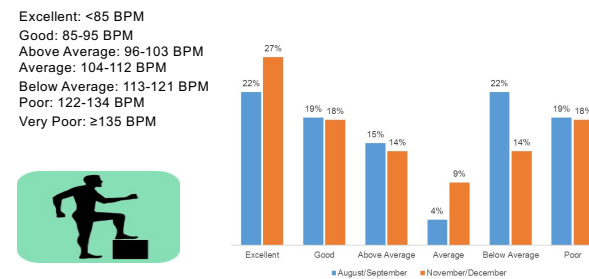


## Methods and Results

**Figure 3.** Blood Pressure Categories.



**Figure 4.** Cardiovascular Fitness Categories.



## Introduction

Many college students do not realize they are at risk for developing CVD or that they have certain CVD risk factors. They believe it is something that they can worry about in the future (Wendt 2005).

- More than half of college students have at least one CVD risk factor (Tran 2015).
- One-third of college students fail to see the link between their health behaviors and CVD risk (Tran 2015).
- Approximately 34% of college students are either overweight or obese based on self-reported weight and height (American College Health Association 2016).

## Research Question

**What is the relationship between BMI and other health markers (i.e., blood pressure, body fat percentages, and cardiovascular fitness) in female college freshmen?**

## Practical Application and Summary

The data suggests that CVD risk factors are present among college students. Significant increases in CVD risk factors during the first semester of college indicate that targeted CVD education is needed. Therefore college is a great time to address and educate students of risk factors to prevent CVD later in life. However, more research needs to be conducted.

## References

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