Impact of Biological Attractiveness on BMI and Body Fat Percentage

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Abstract

Waist-to-hip ratio (WHR) has been a reported indicator of health and reproductive status. This has led to many studies on the relationship between WHR and perceived attractiveness. Studies have shown that women with a WHR of .70 are perceived more attractive by men than women with a WHR of .80. PURPOSE: the purpose of this study was to compare body composition and body mass index (BMI) based on perceived attractiveness quantified by WHR. METHODS: 45 full-time female students 18-25y participated in this study. Anthropometric measures were collected (height, weight, waist and hip circumferences). Percent body fat data were collected using a DXA scan (Lunar iDXA). Students were divided into groups based on WHR (less than or equal to .74 = attractive or greater than or equal to .75 = not attractive). RESULTS: A one-way analysis of variance (ANOVA) was used to determine if differences exist between BMI and body fat percentage based on WHR. There was a significant effect of WHR on BMI (attractive = 22.98 ± 3.38 kg/m2; not attractive = 26.49 ± 6.74 kg/m2) at p>0.05 level [F (43, 1) = 5.44, p= 0.024], but not body fat percentage (attractive = 32.74 ± 5.35%; not attractive = 35.69 ± 6.84%) [F (43, 1) = 2.52, p= 0.120]. CONCLUSION: The study showed women who were categorized as attractive based on WHR had a normal BMI, but a body fat percentage above the healthy range. Attractiveness based on WHR and BMI could lead to an underestimation of health risks associated with excess body fat.

PURPOSE

- Previous research has reported perceived biological attractiveness as indications of health, youth, and fertility of potential mates.
- Women with a WHR of 0.70 are perceived as more biologically attractive than women with a WHR of 0.80.
- The purpose of this study was to compare body composition and body mass index (BMI) based on perceived biological attractiveness quantified by WHR.

METHODS

Participants:

- 45 full-time female students 18-25y
- All students were from a small, rural, commuter university.
- Exclusions included women who were pregnant and student athletes.
- Based on WHR attractiveness, participants with a WHR ≤ 0.74 were classified as biologically attractive and participants with WHR ≥ 0.75 were classified as not biologically attractive.

Anthropometric Measurements

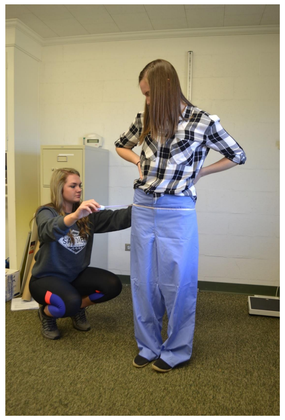
- Height was measured to the nearest 0.1 cm using a digital wall mounted stadiometer (Seca model 242, Hamburg, Germany.)
- Body weight was measured to the nearest 0.1 kg using a digital scale (Seca model 869, Hamburg, Germany)
- BMI was calculated by the following equation: BMI = Weight (kg)/ Height (m^2) .
- Waist circumference was measured to the nearest 0.1 cm using a standard tape measure on the skin at the narrowest part of the waist between the xyphoid process and the umbilicus.
- Hip circumference was measured to the nearest 0.1 cm around the widest part of the gluteus maximus.

DXA Scan

- Body composition was measured by dual-energy x-ray absorptiometry (DXA) using a GE Lunar iDXA (Waukesha, Wisconsin).

Data Analysis

- A one-way analysis of variance (ANOVA) was used to determine if differences exist between BMI and body fat percentage based on WHR.



RESULTS

Table 1. Descriptive Characteristics of Participants

	Waist hip category based on attractiveness		
	≤ 0.74	≥ 0.75	Total
Age (yr)	19.4 ± 1.2	19.5 ± 1.5	19.4 ± 1.3
Weight (kg)	60.0 ± 9.6	68.2 ± 19.9	62.6 ± 14.2
Height (cm)	161.4 ± 8.0	159.8 ± 5.7	160.8 ± 7.3
DXA Body Fat (%)	32.7 ± 5.4	35.7 ± 6.8	33.7 ± 6.0
BMI (kg/m^2)	23.0 ± 3.4	26.5 ± 6.7	24.2 ± 5.0

- There was a significant effect of WHR on BMI (biologically attractive (≤ 0.74) = 22.98 ± 3.38 kg/m^2; not biologically attractive (≥ 0.75) = 26.49 ± 6.74 kg/m^2) at p>0.05 level [F (43, 1) = 5.44, p= 0.024], but not body fat percentage (biologically attractive (≤ 0.74) = 32.74 ± 5.35%; not biologically attractive (≥ 0.75) = 35.69 ± 6.84%) [F (43, 1) = 2.52, p= 0.120].

CONCLUSIONS

- The study showed women who were categorized as biologically attractive (≤ 0.74) based on WHR had a normal BMI, but a body fat percentage above the healthy range (20% to 32% for women).
- Biological Attractiveness (≤ 0.74) based on WHR in addition to BMI could lead to an underestimation of health risks associated with excess body fat. WHR ≤ 0.74 does not necessarily mean a person is healthy. While biological attractiveness may be an indicator of health, it should be used with other body composition measurements.
- The sample consisted of 45 full-time female students 18-25y. In future studies a larger sample would be more representative of traditional aged female college students at a small university.
- The study showed that women who were perceived as biologically attractive (≤ 0.74) were not necessarily healthy based on body fat percentage. In future studies, it would be interesting to examine fitness levels between these groups.

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