Journal of Health, Sports, and Kinesiology, 2021, 2(1), 9-10

Research Abstract **Open Access**

Associations Between Adiposity and Muscular Strength in Healthy Adults

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Abstract

Excessive adipose tissue has deleterious effects on the physiology of humans, including consequences related to skeletal muscle performance. Since adiposity is assessed using various tools, the relationship between adiposity and muscular strength is not well understood. The purpose of this study was to examine the relationship between adiposity and normalized strength (NS) in healthy United States adults and determine if sex differences existed.

Keywords: adiposity, muscular strength, healthy adult

Article History
Received 11 September 2020
Accepted 17 October 2020
Published 31 January 2021
Available online 19 February 2021
https://doi.org/10.47544/johsk.2021.2.1.9

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Methods
One hundred forty (140) healthy males and females aged 18-40 years participated in this study. Data were collected during two sessions separated by at least 48 hours. During session one, measurements performed included skinfold analysis (3-site test; Jackson Pollock nomogram was used to estimate body fat percentage), waist circumference (WC), height, and body mass. During session two, participants performed a one-repetition maximum (1RM) test in the barbell bench press exercise. Muscular strength was normalized by dividing 1RM values by body mass. Linear regression was used to explore the participant's NS values in relation to their body fat percentage (BF%), body mass index (BMI), WC, and waist-to-height ratio (WHtR) values.

Results
Inverse associations were found between BF% and NS in both males ($p < 0.0001$, parameter estimate: -0.0354) and females ($p = 0.0147$, parameter estimate: -0.0084); positive associations were found between BMI and NS for both males ($p = 0.0031$, parameter estimate: 0.0509) and females ($p = 0.0098$, parameter estimate: 0.0211); an inverse association between WC and NS was exhibited only amongst females ($p = 0.0370$, parameter estimate: -0.0111), and no significant associations were observed between WHtR and NS for either sex.

Discussion

Higher BF% is associated with lower NS in both sexes, and higher abdominal adiposity is associated with decreased NS only in females. These data highlight the importance of including measures of adiposity and abdominal adiposity in routine clinical practice and in fitness settings.