

Physical Inactivity during COVID-19 Moderates Body Fat Percentage - Relative Handgrip Strength Relationship on Black Females.

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ABSTRACT

Metabolic syndrome (MetS) prevalence is high in Blacks. Physical inactivity is among the contributing factors of MetS development. Relative handgrip strength (HS_R), divided by body mass index, is negatively linked to MetS. Increased body fat percentage (BF%) worsens HS_R and contributes to MetS. Physical activity (PA) improves related-MetS risk factors. Only 45% of Blacks over 18 years and less than 40% of US females are meeting the ACSM PA guidelines. During COVID-19 PA levels have been decreasing, while stress has been increasing. Such a phenomenon may contribute to MetS due to a change in BF%- HS_R dynamics. **PURPOSE:** To explore associations between BF% and HS_R and to investigate the effect of being physically active during the pandemic on the BF%- HS_R relationship. **METHODS:** Anthropometrics, HS (dynamometer), and BF% (bioelectrical analysis) measurements performed on nine black female college students (age 21.3 ± 4.0 yr). PROCESS[®] v.3 by Hayes moderation analysis performed using SPSS[®]. BF% centered for product construction and heteroscedasticity consistent error. Moderation and conditioning significance set at $p < 0.05$. **RESULTS:** Model significantly predicted HS_R ($F_{3,5} = 503.1$, $p < .001$, $R^2 = .73$). BF% and PA significantly predicted HS_R ($b = -.1$, $t_5 = -5.0$, $p = .004$ and $b = -1.2$, $t_5 = -8.3$, $p = .0004$ respectively). BF% x PA interaction significantly moderated HS_R ($F_{1,5} = 57.9$, $p = .0006$, $\Delta R^2 = .2$). Black females, who met the PA guidelines before but not during the pandemic, presented significant positive relationship between BF% and HS_R ($b = 0.07$, $t_5 = 38.1$, $p < .001$). **CONCLUSION:** Results support the negative clinical relationship of BF% and HS_R for previously physically active Black females that kept exercising during the stressful pandemic period. For those who did not remain physically active during the pandemic, BF% and HS_R relationship was adversely (positive) moderated by their choice. No causal inferences can be drawn due to the cross-sectional design and small sample size. However, based on Bjorntröpp hypothesis, the combined effect of physical inactivity and additional stress during COVID-19 may have altered the hypothalamic-pituitary-adrenal axis and increased cortisol levels that led to an increase in fat accumulation. Larger-scale studies are needed to examine the mechanistic explanation of this observation.