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Associations between BMI, Body Composition, Sleep and Physical Activity in College Students

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Body Mass Index (BMI) is a universal method for weight classification, but is limited by its inability to assess body composition and may lead to improper weight classification especially for muscular individuals. Obesity is associated with poorer sleep and decreased physical activity but many evaluations rely on BMI rather than body composition classification. **Purpose:** We aimed to compare classification of weight status based on BMI and body composition and to evaluate associations between these measures and sleep and physical activity. **Methods:** College age subjects (N=28, 19.9±1.7 y, n=19 females) were recruited to participate in a two-week study. Participants completed a demographic survey, physical activity questionnaire, the Pittsburg Sleep Quality Index (PSQI), anthropometric measurements, two weeks of wrist-worn actigraphy, and a dual-Energy X-Ray Absorptiometry scan. Participants were classified as normal weight, overweight or obese based on WHO BMI classification and ACSM Body Composition classification. Cohen's Kappa was used for interrater reliability and Pearson correlations were used for associations. **Results**: There was poor interrater reliability (0.049±.05 $p>0.05$) between BMI and body composition for weight classification. Increased body fat percentage was not associated with subjective (PSQI) sleep outcomes, but was correlated with less sleep fragmentation ($r(28)=-0.45$, $p=0.017$) and lower sleep efficiency ($r(28)=0.332$ $p=0.085$), and decreased frequency of cardiovascular ($r(28)=-0.49$ $p=0.007$) and resistance ($r(28)=-.44$ $p=0.003$) exercise. Increased BMI was not associated with objective sleep outcomes or physical activity measures, but was correlated with increased subjective sleep disturbances ($r(28)=0.442$ $p=0.018$). **Conclusion:** There is particularly poor agreement between BMI and body composition classification for young adults. Body composition classification may be more useful for examining relationships between weight status and other health behaviors. In this sample, we found that participants with higher body fat percentages performed less exercise but exhibited better measures of sleep continuity. Data collection is ongoing to enlarge the sample size and examine comparisons between weight status groups.