Concurrent relationship of objectively measured physical activity and cardiorespiratory fitness on two different measures of obesity in U.S. adults

**Background:** Few population-based studies have examined the relationship of both physical activity (PA) and cardiorespiratory fitness (CRF) on the growing health problem of obesity. The purpose of this study was to examine the concurrent relationship of PA and CRF on two different measures of obesity. **Methods:** This study used data from adults 20-49 years of age participating in the 2003-2004 National Health and Nutrition Examination Survey (NHANES). Moderate-to-vigorous PA (MVPA, min/day) was objectively determined by use of accelerometer and participants were categorized into low or high groups using the median. CRF (ml/kg/min) was assessed using a submaximal treadmill test and measures were categorized into low or high values by applying age- and sex-specific standards. Using body mass index (BMI), participants were categorized as obese if their values were 30 kg/m² or greater. Using waist circumference (WC), participants were categorized as obese if their values were greater than 88 (females) or 102 cm (males). Linear regression was used to test for mean CRF differences in study variables. Logistic regression was used to model the relationship between MVPA, CRF and obesity. **Results:** Participants in the high CRF group had significantly (ps<.05) greater MVPA across all obesity groupings. In BMI obese, neither BMI nor WC were significantly different between CRF groups. However, in WC obese, both BMI and WC were significantly (ps<.05) lower in the high CRF group. Among adults with low CRF, those with low MVPA were more than twice as likely to be obese than those with high MVPA using BMI (OR=2.48; 95% CI: 1.23-5.01) and WC (OR=2.06; 95% CI: 1.29-3.29). Among adults with high CRF, no MVPA and obesity relationship was seen. **Conclusion:** Results from this study indicate that PA is only related to obesity when CRF is low. Furthermore, high CRF may protect less physically active adults from both overall and abdominal obesity.