

Time Spent in Sedentary and Physical Activity in College-Aged Women Based on Body Composition

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ABSTRACT

BACKGROUND: Physical activity is an important contributor to overall health; however, as most young adults transition into college, physical activity decreases and sedentary time increases. Body composition also may change during this time. While these factors have been studied in students at large, public 4-year institutions, less is known about the health habits of students at smaller, commuter-based campuses. The purpose of this study was to examine if differences existed in time spent in physical activity categories (sedentary; light; moderate to vigorous, MVPA) between women with a healthy body fat (HBF) percentage and those considered overfat (OBF). **METHODS:** 49 traditional-aged (18-25 y), full-time female students at a rural, commuter-based, predominantly two-year university were recruited. Height (cm), weight (kg), and body fat percentage (%fat, dual energy x-ray absorptiometry) were measured. Participants were requested to wear an accelerometer during all waking hours for 7 consecutive days. Groups were determined using ACSM recommendations for women: a healthy body fat group (HBF; ≤ 32.0 %fat, $n = 21$) and an overfat group (OBF, >32.0 %fat, $n = 28$). A one-way MANOVA was used to determine differences in time spent in physical activity (sedentary, light, MVPA) based on %fat. **RESULTS:** No significant differences were found for time spent at any intensity level between groups, Wilks' lambda = .951, $F(3, 45) = .773$, $p = .5151$, partial eta squared = .049, (Sedentary time, HBF = 4024.9 vs. OBF = 3848.2 min; Light, HBF = 1380.1 vs. OBF = 1086.2 min; MVPA, HBF = 193.2 vs. OBF = 227.9 min). **DISCUSSION:** Despite previously reported associations between obesity and physical activity, there were no differences in any physical activity category between the groups. The small sample may have impacted the lack of statistical significance as there seemed to be some practical differences between groups. In particular, the HBF group spent 300 minutes more per week in light physical activity. Perhaps this indicates time spent in non-exercise activity thermogenesis through light activity is a critical factor in our sample. In addition to a larger sample size, other measures of health or health behaviors such as nutrition, sleep, and cardiovascular fitness may have further strengthened our understanding of these groups.

INTRODUCTION

The transition from high school to college typically results in differences in fitness levels demonstrated by changes in body composition and a decrease in time spent in physical activity.

Previous reports have found that female college students are less physically active than male college students.

The purpose of this study was to examine if differences existed in time spent in physical activity categories (sedentary; light; moderate to vigorous, MVPA) between college-aged women with a healthy body fat (HBF) percentage and those considered overfat (OBF).

METHODS

Participants

Forty-nine traditional-aged (18-25y) full time, female college students at a predominantly 2-year, rural, commuter-based campus.

Anthropometric Measures

Height (cm) and weight (kg) were measured using a wall-mounted digital-read stadiometer (Seca model 869, Hamburg, Germany) and digital scale (Seca model 869, Hamburg, Germany), respectively.

DXA Scan

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

Participants were divided into two groups based on their body fat percentage

Healthy Body Fat Group (HBF) = $\leq 32.0\%$ BF
Overfat Group (OBF) = $> 32.0\%$ BF

Physical Activity Measurement

Participants were instructed to wear an Actigraph accelerometer (GT3X, Pensacola, FL) for seven consecutive days during all waking hours.

Total time spent in sedentary, light, MVPA categories was considered for this study (including bouts <10 minutes).

Daily logs of wear time were used to validate the accelerometer data.



Data Analysis

A one-way multivariate analysis of variance (MANOVA) was used to determine if there were differences time spent physical activity levels (sedentary, light, MVPA) between the HBF and OBF groups.

RESULTS

Table 1. Subject Demographics

	HBF (n = 21) Mean \pm Std Dev	OBF (n = 28) Mean \pm Std Dev
Age (yr)	19.52 \pm 1.66	19.14 \pm 1.18
Height (cm)	164.43 \pm 6.39	164.76 \pm 4.33
Weight (kg)	57.46 \pm 8.37	75.86 \pm 14.87
BMI (kg/m ²)	21.25 \pm 2.87	27.90 \pm 5.16
Body Fat (%)	27.99 \pm 3.65	38.84 \pm 4.24

Table 2. Time Spent in Activity Levels

	HBF (n = 21) Mean \pm Std Dev	OBF (n = 28) Mean \pm Std Dev
Time Spent in Sedentary Activity (minutes)	4024.88 \pm 810.55	3848.16 \pm 912.65
Time Spent in Light Activity (minutes)	923.06 \pm 222.87	1086.18 \pm 402.61
Time Spent in MVPA (minutes)	193.25 \pm 100.51	227.86 \pm 159.02

No significant differences were found for time spent in any intensity level between groups, Wilks' lambda = .925, $F(3, 45) = 1.213$, $p = .316$, $\eta_p^2 = .075$.

CONCLUSIONS

College-aged women at a predominantly 2-year, rural, commuter-based campus spend similar amounts of time in all physical activity levels regardless of body composition. This is contrary to previously published literature that suggests that body composition may have a significant impact on physical activity in young adults (Green et al., 2014). Our results may be due to the small sample size. Better understanding of this population may have been achieved with the collection of additional health measures.

Further analyses of these data did not reveal the potential practical significance in light physical activity between groups previously shared in our preliminary conclusions. Despite this, more investigation on light physical activity may be warranted.

Future studies should continue to examine the impact of body composition on physical activity and cardiometabolic health. Our sample lacked physical activity bouts >10 minutes which should be considered. Comparison of students at a smaller, commuter-based campus to a large, public institution may provide insight on physical activity habits due to environment.

REFERENCES

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