Ethnic Differences in Dietary Intakes, Physical Activity, and Energy Expenditure in Middle-aged, Premenopausal Women: The Healthy Transitions Study

**OBJECTIVE**
To compare dietary intakes and energy expenditure between middle-aged, premenopausal African-American and white women.

**STUDY DETAILS**
– Cross-sectional analysis of a 4-year longitudinal study of menopausal transition
– 97 white women and 52 African-American women, mean age 47.4 ± 0.2 years
– All participants completed a 4-day food record following instruction from a dietitian
– Physical activity was measured by a physical-activity-recall questionnaire, data from a motion sensor worn for 4 consecutive days (expressed as total daily energy expenditure [EE]), and a detailed 24-hour activity record completed during the 4 days wearing a motion sensor
– Compared to measured EE, there may have been underreporting of dietary intake of 300 to 400 kcal/day
– Height, weight, and body composition was measured by dual-energy x-ray absorptiometry (DEXA)
– 24-hour EE and its components were determined with a whole-room calorimeter in a subset of 56 women (12 African-American and 44 whites)
– Exclusions included: those taking medication regularly (including hormones), not having regular menstrual cycles, or had clinically abnormal results from laboratory tests or the physical exam

**KEY FINDING**
Higher calcium and fiber intakes were associated with lower body fat. Higher total, saturated and monounsaturated fat intakes were associated with higher body fat.
Fiber was the strongest single predictor of fatness.

**RESULTS**
– African-American women had significantly higher body mass index (BMI), fat mass, lean mass, and percentage body fat than white women
– Sleeping (basal) EE was significantly lower in African-American women than in white women, after adjusting for lean and fat mass, indicating a lower metabolic rate (p=0.02)
– However, there was no significant difference between groups in total daily EE, measured by calorimeter or by activity monitor

<table>
<thead>
<tr>
<th></th>
<th>African-American women (n=52)</th>
<th>White women (n=97)</th>
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</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>46.7 ± 0.3</td>
<td>47.7 ± 0.2*</td>
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<tr>
<td>Height (cm)</td>
<td>164.5 ± 0.8</td>
<td>163.9 ± 0.6</td>
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<tr>
<td>Weight (kg)</td>
<td>78.3 ± 2.3</td>
<td>68.0 ± 1.2</td>
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<tr>
<td>BMI (kg/m²)</td>
<td>28.9 ± 0.8</td>
<td>25.4 ± 0.4*</td>
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<tr>
<td>Fat mass (kg)</td>
<td>33.4 ± 1.7</td>
<td>27.0 ± 1.0*</td>
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<tr>
<td>Lean mass (kg)</td>
<td>41.0 ± 0.8</td>
<td>37.7 ± 0.4*</td>
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<td>% body fat</td>
<td>42.2 ± 0.8</td>
<td>39.2 ± 0.8*</td>
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* p<0.05

– African-American women consumed significantly less protein, fiber, calcium and magnesium than white women in this study
– There was no significant difference in total dietary fat or carbohydrate intake. However there was a significant race difference in the intake of polyunsaturated fat and specific fatty acids
– An increase in percentage body fat or BMI was associated with an increase in total fat, saturated fat, monounsaturated fat and dietary cholesterol
An increase in calcium, magnesium, eicosapentanoic acid (EPA; 22:5n-3), fiber and docosahexanoic acid (DHA; 22:6n-3) intakes were associated with a decrease in percentage body fat.

The magnitude of the effect of fiber, calcium and magnesium was greater in white women whereas the magnitude of the effect of myristic acid was greater in African-American women.

There was a significant difference between races in the relation between dietary calcium and BMI ($p=0.04$).

Dietary fiber was the strongest independent predictor of percentage body fat, with exercise the second strongest predictor, in multi-regression analysis.