

Cross-sectional analysis of anthropometric parameters and plasma glucose in a sample of undergraduate students at the Institute of Chemistry Ceylon

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Non-communicable diseases (NCDs) are closely linked to obesity, fat distribution, and glucose regulation, yet early metabolic disturbances in young adults remain understudied. This cross-sectional study examined anthropometric parameters, fasting blood sugar (FBS), and body composition among 80 undergraduates (26 males, 54 females) at the Institute of Chemistry Ceylon, to identify gender differences and associations among measured variables. Anthropometric measures included body mass index (BMI), waist and hip circumference, and skinfold thickness, while body composition was assessed by bioelectrical impedance analysis. FBS was measured using a colourimeter based on the glucose oxidase assay. Data were analyzed using descriptive statistics, independent-sample t-tests, ANOVA, and Pearson correlation analysis. Males demonstrated a higher mean BMI ($25 \pm 5 \text{ kg/m}^2$) compared to females ($23 \pm 4 \text{ kg/m}^2$). Based on the WHO classification, 34.7% of participants were overweight and 6.7% underweight. Waist-to-hip ratio and visceral fat were significantly higher in males, whereas females had greater skinfold thickness and subcutaneous fat. Compared to females, males had lower body fat percentage ($25 \pm 6\%$ vs 33

$\pm 5\%$) and lower subcutaneous fat ($18 \pm 4\%$ vs $27 \pm 5\%$), a higher resting metabolic rate (1610 ± 239 vs $1214 \pm 129 \text{ kcal}$), higher visceral fat (9 ± 5 vs 4.5 ± 3), and higher skeletal muscle percentage ($31 \pm 2\%$ vs $25 \pm 2\%$) ($p < 0.05$). However, fasting blood sugar measured by the colourimeter did not differ significantly between males and females ($85 \pm 9 \text{ mg/dL}$ vs $86 \pm 12 \text{ mg/dL}$). Pearson correlations showed strong positive associations between BMI and visceral fat ($r = 0.992$ in males; $r = 0.971$ in females) and between BMI and RMR ($r = 0.886$ in males; $r = 0.908$ in females). Skinfold thickness correlated with subcutaneous fat in females, while FBS was not significantly correlated with anthropometric or body composition measures.

Keywords:

Anthropometry, Body composition, Body Mass Index (BMI), Fasting blood glucose (FBS), Resting metabolic rate (RMR)