

Five Week Summer School Program Improved Glucose and Lipoprotein Profiles in Hispanic Female High School Students

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ABSTRACT

There has been a drastic rise in obese children and adolescents in the past few decades. Evidence suggests that adolescents decrease physical activity during the summer months, contributing to this rise.

PURPOSE: To investigate whether a 5-week summer school program involving physical activity has an effect on plasma glucose levels and lipid profiles among Hispanic female high school students.

METHODS: Thirty-three female high school students (15-17 years) from an underprivileged Hispanic area in southern Texas were randomly assigned to either an experimental group that participated in a summer school program (n=17) or a control group that did not participate (n=16). All participants had a body mass index (BMI) greater than the 85th percentile. The summer school program was held 5 days per week (08:00-16:00) for 5 weeks, involving a variety of physical activities (aerobic exercise, muscular strength and endurance training, sports games, and fun activities such as tag and ball games etc.) for 90 minutes each day. Non-summer school attendants maintained normal summer activity. Overnight-fasting blood (5 mL) was collected pre- and post-study to analyze changes in plasma glucose and lipid profiles. All data were analyzed by a two-way analysis of variance (ANOVA) with the Sidak's post-hoc test for any significant interactions. When LDL-C and glucose variables were different between baseline groups, the delta analysis was conducted ($p < 0.05$). **RESULTS:** Regardless of summer school attendance, HDL-C was reduced by 1.77 mg/dL (42.75±0.63 mg/dL to 40.98±0.63 mg/dL), which was statistically significant ($p=.033$). After participation in the summer school program, LDL-C and glucose levels decreased by 12.44±5.16 mg/dL and 5.55±3.83 mg/dL, respectively, as opposed to the levels of these parameters in non-participants which increased by 4.10±5.51 mg/dL and 8.13±5.09 mg/dL, respectively. No other variables were significantly different. **CONCLUSION:** LDL-C and plasma glucose levels were reduced significantly in participants in the summer school program as compared to those of non-summer school participants. Although HDL-C decreased independently of the summer school program, it remained within a healthy range. Therefore, the summer school program may be an effective method of improving plasma glucose and lipid profiles.