

Effectiveness of a Novel Pediatric Obesity Prevention Program on Endurance and Flexibility



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Introduction

Catawba Valley Medical Center seeks to prevent and treat childhood obesity by observational learning and active participation in the context of a simulated home environment, the *Healthy House*. Towards this goal, participants are encouraged to acquire positive behaviors, minimize negative behaviors, and translate these positive behaviors into lifestyle changes. A novel pediatric obesity prevention program, Wellness Fitness, Awareness & Nutrition (FAN), was developed that emphasizes energy balance. The fitness component utilizes active play to engage preschoolers in expending energy through fun indoor and outdoor activities.

Purpose: This study was designed to determine the effectiveness of the Wellness FAN program on cardiovascular endurance and flexibility of preschoolers.

Experimental Design and Methods

Study Design: A pre/post comparative research design was used. The study was conducted prospectively.

Sample: 3-5 yrs old subjects (N=116) were recruited through the local Head Start program. African American (AA), Hispanic (HS), and Caucasian (CA) ethnicities were represented.

Intervention: Children participated in the Wellness FAN program for 45-minute intervals in 9 sessions over the academic year. The fitness curriculum included aerobic and muscular strengthening exercises, sports and balance skills as well as limited stretching for 15 min of each session.

Data Analysis: Initial and ending measurements of BMI, 6-inch step test and sit-n-reach test were collected. Mean changes in these measures ($T_{ending} - T_{initial}$) were evaluated. Two-tailed *t*-tests and chi-squared tests were used to calculate *p* values, which were considered significant at $\leq .05$.

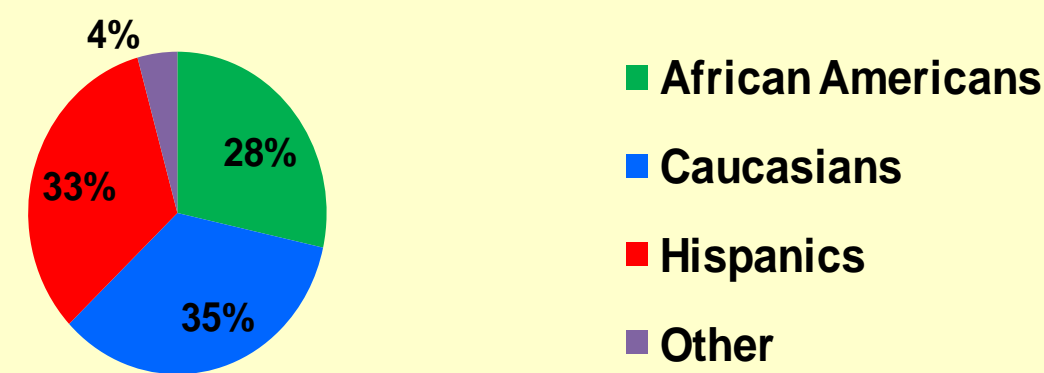


Demographics

Characteristic	Statistic	<i>p</i> Value
Gender (n)	$\chi^2=.004$.632
Male	60	
Female	56	
Mean Age (yrs, SD)	$t=1.98$.219
Male	4.38 ± .53	
Female	4.26 ± .49	
Age Range (yrs)		
Male	3.10 – 5.06	
Female	3.08 – 4.97	

- Sample homogeneous with regard to gender and age

Ethnicity Distribution



- Majority of sample (96%) comprised of AA, CA & HS children with the three ethnicities similarly represented

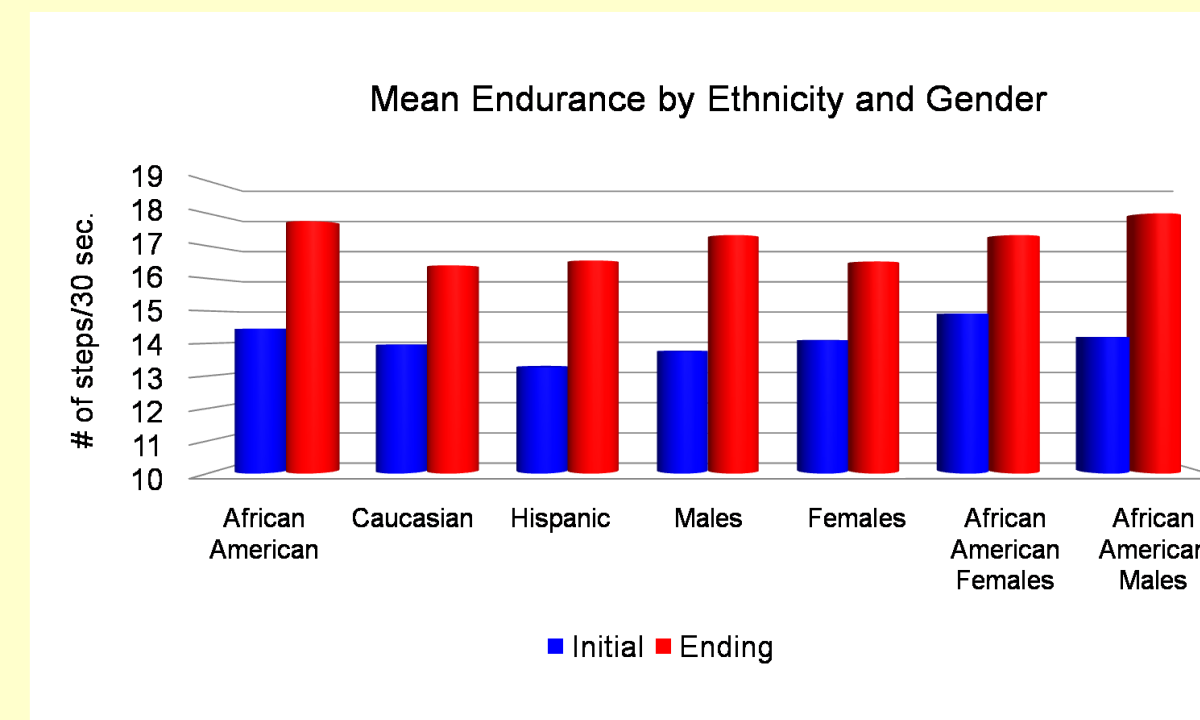
BMI Analysis

Description	Initial Mean BMI	Ending Mean BMI	<i>p</i> Value
All Participants (N=116)	16.63	16.79	.032 †
Males (n=60)	17.29	17.27	.825
Females (n=56)	15.92	16.27	<.001†
Caucasians (n=40)	16.11	16.12	.958
Hispanics (n=38)	16.86	17.02	.205
African Americans (n=33)	17.13	17.42	.018†
African American Males (n=21)	17.31	17.48	.183
African American Females (n=12)	16.81	17.32	.055‡

†Significant at CI=95%
‡Significant at CI=94.5%

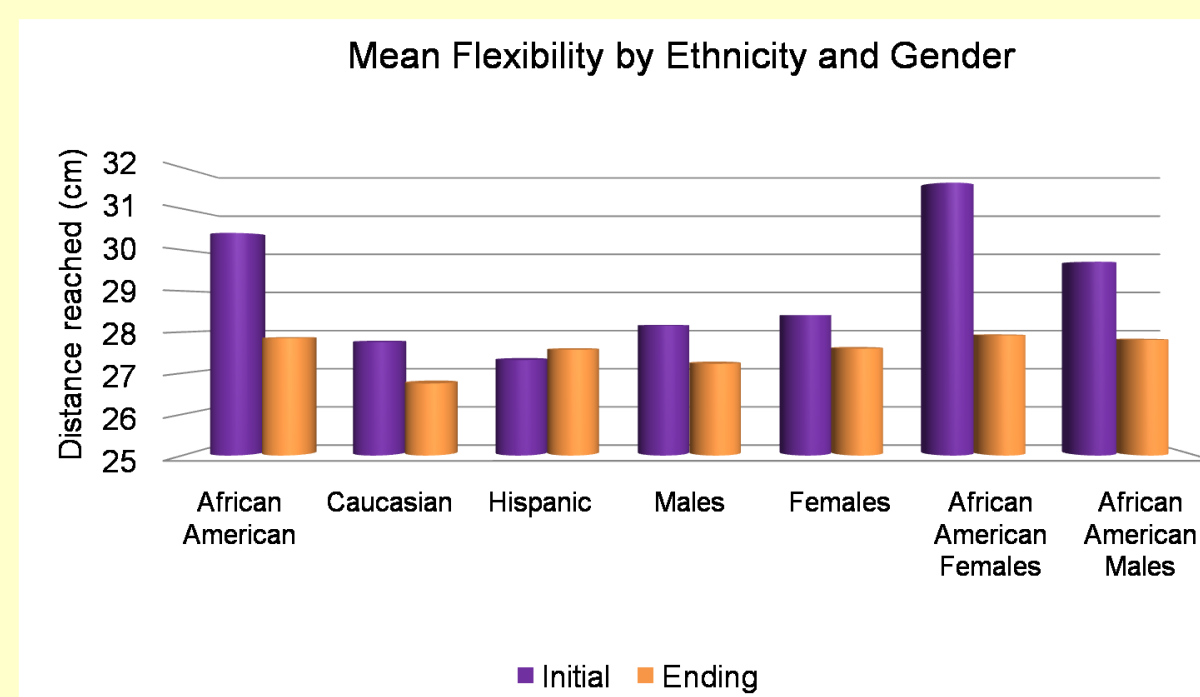
- Observed significant BMI increases between initial and ending values for the total sample, females and AA children
- At 94.5% confidence, AA females had a significant increase in BMI – which was not seen in CA or HS females

Fitness Outcome: Endurance



- Mean 9-mo endurance values (ending) were significantly higher than baseline (initial) for the total sample ($p<.001$)
- Ending endurance values for AA preschoolers (17.76 steps) surpassed that of CA children (16.4 steps)
- HS children had the lowest initial mean endurance (13.26) and their 9-mo endurance measurements (16.55) outpaced their CA counterparts
- Male mean change in endurance increased more than that of females, 3.58 steps vs. 2.43 steps, respectively
- Increased endurance of AA females was not significant ($p=.07$), but their mean baseline endurance (14.92 steps) was the highest of all groups

Fitness Outcome: Flexibility



- Flexibility decreased for all groups except HS preschoolers
- HS mean flexibility increased, but not significantly ($p=.07$)
- Decrease in mean AA flexibility was significant ($p=.01$)
- Flexibility in AA females decreased significantly ($p=.02$), but reduced AA male flexibility was not significant ($p=.101$)
- Male, female and CA mean flexibility decreases were not statistically significant

Summary and Conclusion

Conclusions

- The FAN program emphasizes active play over stretching, which correlates with study findings of improved endurance and flexibility loss for the total sample population
- 3-5 yr old AA females demonstrated a significant increase in BMI (94.5% CI), a significant reduction in flexibility (95% CI), and their increase in endurance was not significant (95% CI)
- In adults, obesity and co-morbidities are greater for AA than for either HS or CA and greatest for AA females

Study Limitations

- Lack of complete data for all preschoolers recruited initially
- Small sample of AA females (n=12)
- Single year evaluation of the Wellness FAN program

Future Directions

- Increase stretching activities



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