

INTRODUCTION

- Childhood obesity is a public health epidemic that requires prevention and intervention.
- Schools are common settings for wellness interventions, and social determinants of health (SDH) can support or impede these efforts.¹
- The Motivating Adolescents with Technology to Choose Health™ (MATCH) is an obesity intervention that has been in middle schools in North Carolina since 2006, currently reaching nearly 10,000 youth annually.²⁻⁵
- Previously, a cumulative score of environmental determinants predicted better participant baseline cardiovascular fitness testing (results of PACER test), but it was not known if sub-categories of SDH determined the relationship.

OBJECTIVE

- To better understand previous findings of an environmental score, use measures of SDH in and around MATCH middle schools to analyze predictors of baseline PACER results in young adolescents.

METHODS

- We used existing cross-sectional data from the 2017-18 school year from MATCH in 47 schools.
- An analysis of linear mixed model analyses were conducted to examine the effects of determinants on baseline PACER score while controlling sex and age at individual level.
- SDH were divided into 6 main sub-categories, which included:
 - Physical activity (PA) opportunities (physical education, physical activity, exercise access)
 - Poverty (free/reduced school lunch, median household income, child poverty, housing problems)
 - Healthcare access (primary care provider and school nurse ratio, rurality, mental health access)
 - Nutrition (food environment index, water availability and access, snack availability, nutritional environment)
 - Safety (county safety and suspension rate)
 - School academic performance
- Data were interpreted using the B-value, which represents the slope of the line between the predictor variable and the dependent variable; also, a p-value < 0.05 and 95% confidence intervals were used to assess statistical significance

RESULTS

Table 1. MATCH Demographics of 2017-18 participants

		N (%)
Sample Size	Students	4,222
	Schools	47
Sex	Males	2498 (51)
	Females	2389 (49)
Ethnicity	Black	1377 (28)
	White	2331 (48)
	Other	1179 (24)
Weight Status (Based on BMI Percentile)*	Underweight (<5%)	107 (2)
	Healthy weight (5-84.9%)	2426 (50)
	Overweight (85-94.9%)	932 (19)
	Obese(≥95%)	1422 (29)

*BMI percentiles based on CDC guidelines

Table 2. Estimate of Fixed Effects of SDH on Baseline PACER

	b-value	p-value	95% Confidence Interval
PA opportunities	3.51	0.04*	[0.19, 6.82]
Poverty	3.70	0.11	[-0.83, 8.24]
Healthcare Access	-2.12	0.25	[-5.74, 1.51]
Nutrition/Safety**	-0.80	0.70	[-5.02, 3.42]
School Academic Performance	2.02	0.24	[-1.44, 5.48]
Male Sex	9.75	0.00*	[8.72, 10.78]
Age	0.00	0.94	[-0.09, 0.09]

*p-values <0.05 are significant
**nutrition and safety variables were combined

KEY FINDINGS

- Analyses included 4,222 participants, half female, with mean age 12.8 years.
- Estimates of fixed effects on baseline PACER showed that better PA opportunities (b = 3.51, p = .04) and male sex (b = 9.75, p = .00) had significant effects on PACER.
- No significant effects were found of poverty, health access, school performance, nutrition, safety, and age.



DISCUSSION

- The previous cumulative score of environmental determinants predicted better baseline cardiovascular testing for students with a higher SDH score, which seems to be driven by the “physical activity opportunities” subscale of the score.
- Focusing on physical activity opportunities in and around schools can have positive impact on cardiovascular health of young adolescents
- PA may have more impact on fitness in this age group than other health determinants
- Longitudinal studies and/or interventions can explore further this relationship

LIMITATIONS

- Not all relevant factors were included in the scales due to lack of data availability and some variables did not differentiate to levels more proximate than county level; thus, other factors can be contributing to better baseline cardiovascular fitness in MATCH participants other than exercise opportunities
- Results may not be generalized to schools or youth in other states or nations

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