

# Determining Trends and Factors Associated with Self-Reported Physical Activity among Adolescents in Rural North Carolina

Sina Kazemzadeh BS, Suzanne Lazorick MD, MPH, Chloe Oppen MD, Xiangming Fang PhD

### Background

- Insufficient physical activity (PA) in the youth can lead to adverse health outcomes, such as cardiovascular diseases and obesity<sup>1,2</sup>
- Adolescents living in rural areas may be at an even greater risk of low levels of PA<sup>3</sup>.
- We used data from a school-based wellness intervention called Motivating Adolescents with Technology to Choose Health™ (MATCH) to evaluate demographics and environmental factors that may impact self-reported PA in adolescents attending middle schools across rural NC

### Methods

- Used existing data from 40 middle schools in 2018 located mainly in rural, Eastern North Carolina.
- Selected independent variables from existing cross-sectional data from fall 2018 MATCH participants (N=3799)
- Determined self-reported PA from a validated questionnaire on behavior and dichotomized results into those achieving 1,5, and 7 days of 60 min. PA per week
- Used scale determined from previous study<sup>4</sup> to select environmental factors based on school and location that may impact adolescent PA levels (Table 1)
- Each school was assigned an environmental score from 1-5 (higher = better environment)
- Analyses: Bivariate correlations, chi-square analysis, and multiple regression models to evaluate associations between environment, sex, race, weight category, age, Body Mass Index (BMI), fitness, and self-reported PA

**Table 1. County and School Level Determinants for PA**

Determinant	Description	Level	Scale	Source
Exercise Opportunities	Adequate access to locations for physical activity	County	1-5	County Health Rankings & Roadmaps
Physical Education (PE)	How health/PE is provided for 7th grade students	School	1-5	School Survey
Physical Activity (PA)	PA exercises available outside of regular PE time	School	1,3,5	School Survey

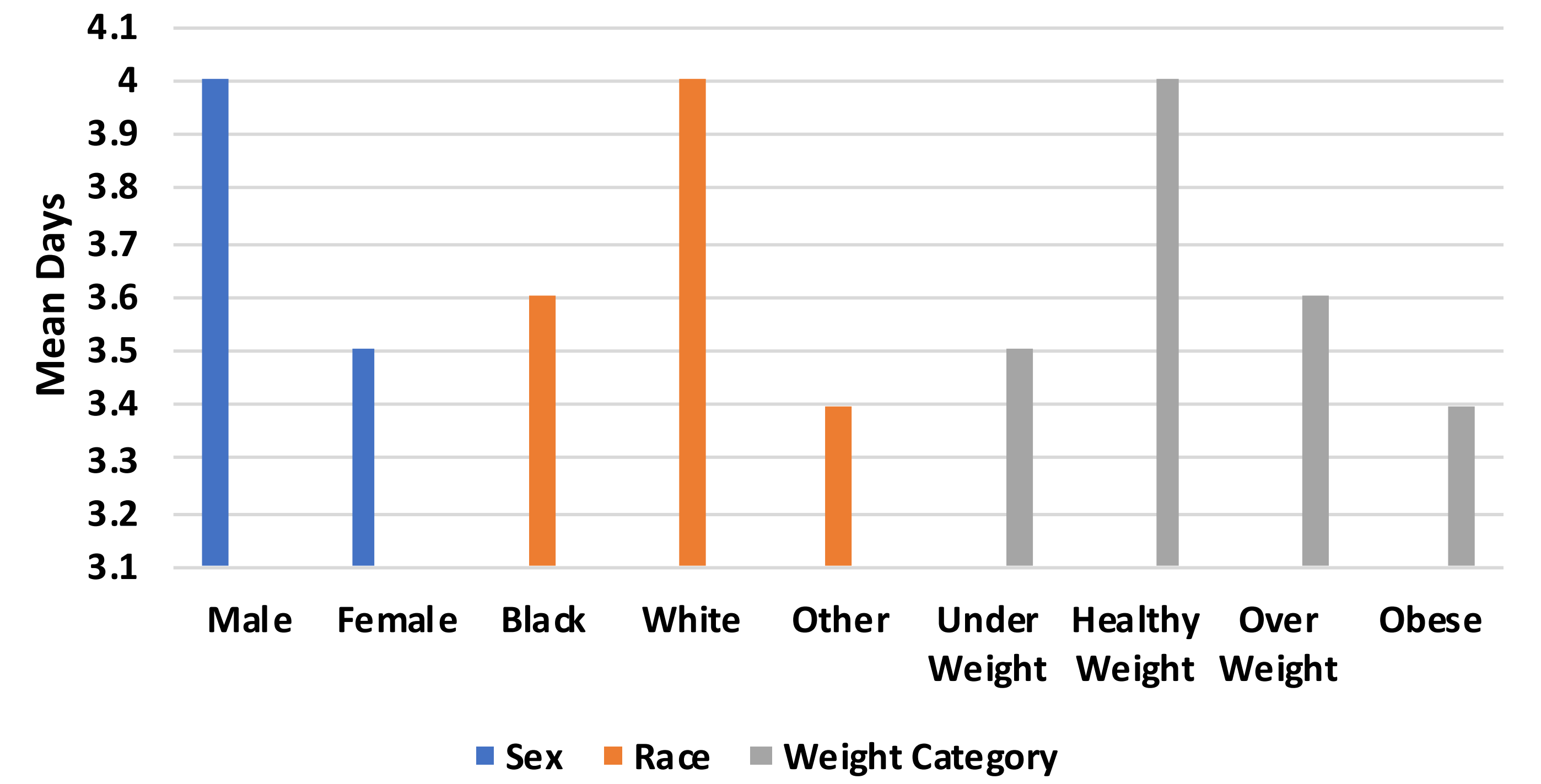
**Table 2 Characteristics of 2018-2019 MATCH Participants and Baseline BMI z-Score, Fitness Testing (PACER), and Self-Reported PA**

Characteristics of 2018-2019 MATCH Participants		
Sample Size, N	Students	3799
	Schools	40
Sex, N (%)	Boys	1942(51.1%)
	Girls	1857 (48.9%)
Ethnicity, N (%)	Black	942 (24.8%)
	White	1871 (49.3%)
	Other	986 (26.0%)
Weight Status (Based on BMI Percentile)	Underweight (< 5%)	108 (2.8%)
	Healthy weight (5%-84.9%)	1925 (50.7%)
	Overweight (85%-94.9%)	709 (18.7%)
	Obese (≥ 95%)	1057 (27.8%)
Body Mass Index, Fitness Testing, and Self-Reported PA		
	Mean (SD)	
BMI z-score	0.8 (1.2)	
PACER test result, # of laps	28.7 (20.6)	
Baseline # of days with 60 min PA	3.7 (2.2)	

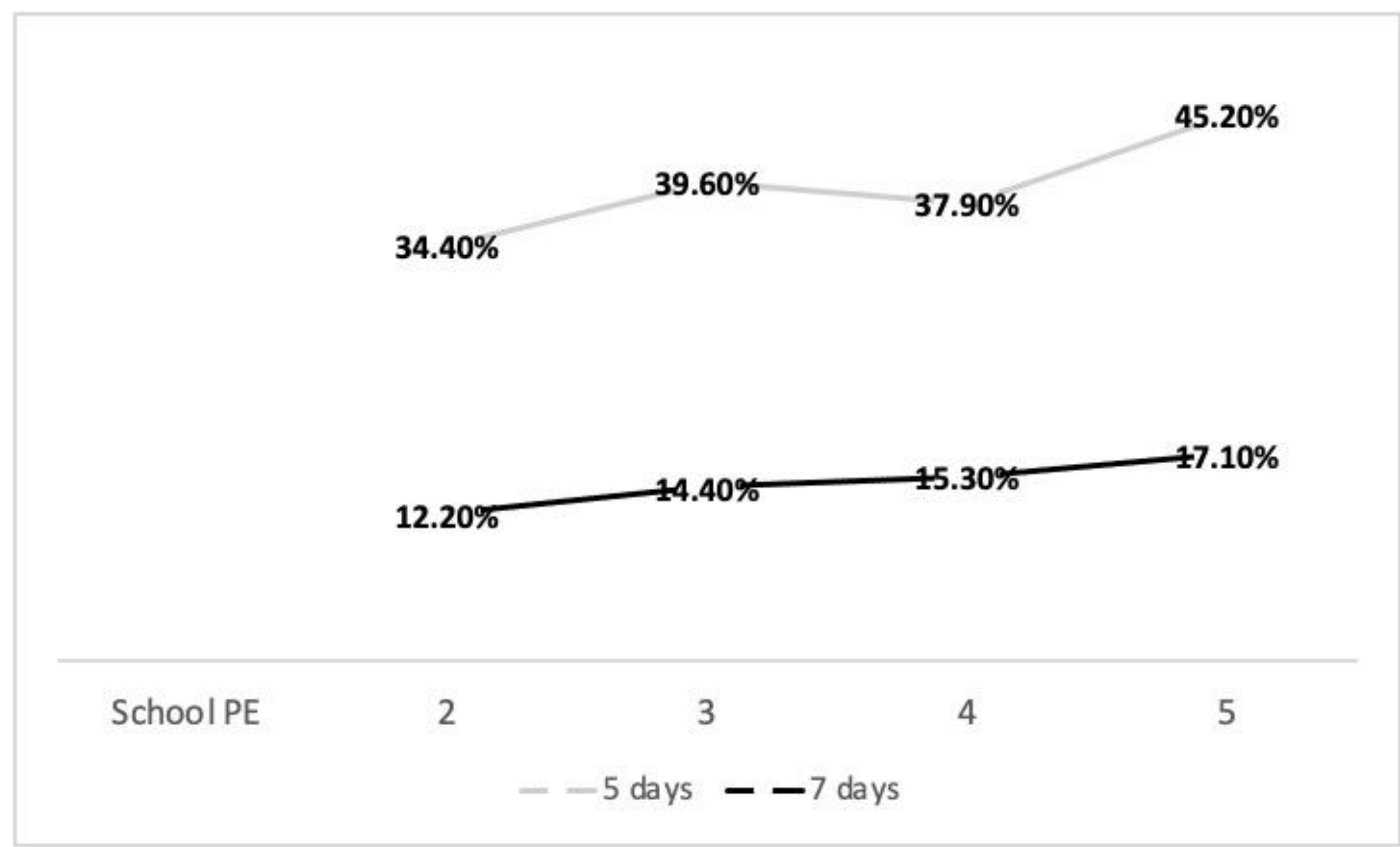
### Results

- Associations between the environmental variables and self-reported PA yielded statistically significant but extremely weak ( $|r| \leq 0.1$ ) relationships
- However, school PE and PACER ( $r = .27, p < .0001$ ) were positively correlated.
- Regression models showed self-reported PA was significantly associated with school PE ( $p = .0011$ ) and race ( $p < 0.0001$ ).
- $X^2$  analysis showed percentage of students who reported 60 minutes of PA for 5 ( $p < .0001$ ) or 7 ( $p = .0307$ ) days per week was significantly different across school PE categories (Figure 2).
- Additionally, it was found that 85% of adolescents did not get 60 minutes of PA per day, as recommended by the CDC.

**Self-reported days of 60 min. PA per week**



**Figure 1.** Unpaired t-test<sup>1</sup> and ANOVA<sup>2</sup> analysis between Sex<sup>1</sup> ( $p < .0001$ ), Race<sup>2</sup> ( $p < .0001$ ), and Weight Category<sup>2</sup> ( $p < .0001$ ) with Self-Reported days of 60 min. of PA



**Figure 2.** % of students who reported 60 minutes of PA for at least 5<sup>1</sup> or 7<sup>2</sup> days a week based on School PE opportunity ( $\chi^2$  analysis). <sup>1</sup> $p < .0001$  <sup>2</sup> $p = .0307$

### Conclusions

- 85% of adolescents at rural schools in NC are not getting the recommended amount of PA, which is at least 60 min. of PA per day
- Adolescents in rural NC report low PA
  - Some groups are at a higher risk, reporting less PA than others, especially female, black, over-weight, and obese participants
- Students at schools with more PE report more days of 60 min. of PA- this may be an opportunity for policy change efforts.

### Limitations

- Data from participants about physical activity are self-reported.
- Information to assess school environment was limited to county- level sources.
- Data are from 2018, which does not represent any potential changes due to Covid-19

### Next Steps

- Next steps- compare to post Covid-19 data
  - Compare PA levels of adolescents in rural NC, before and after the pandemic
  - Investigate changes in associations between independent and dependent variables

### Acknowledgements

- This work was supported by the ECU Summer Scholars Research Program and Research Distinction track
- The MATCH Program is funded in part by the state of North Carolina Supplemental Nutrition Assistance Program – Education (SNAP-Ed), Blue Cross and Blue Shield of North Carolina Foundation.

### References

1. Lee, I-Min et al. 2012. Lancet 380,9838: 219-29.
2. Kumar B, Robinson R, Till S. (2015) *Clin Med.* 15(3):267-272.
3. Edwards, M. B., Bocarro, J. N., & Kanters, M. A. (2013). *Youth & Society*, 45(2), 265-285.
4. Oppen C., Collier C., Fang X., Lazorick S. (2020). *Health Behav Polic Rev.* 7(3):248-262

