

# Effects of Physical Activity and Sport Participation on Mental and Physical Health in Rural, Low-Income, High School Students

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Research shows there are many physical, cognitive, and social factors that influence health and well-being of an individual, particularly during adolescence. To this end, sport participation has been shown to have a positive influence on physical health during adolescence<sup>1</sup> and allows adolescents to increase physical activity levels.<sup>2</sup> Furthermore, studies show increased physical activity levels and sport participation are associated with decreased mental health burdens.<sup>3,4</sup> The purpose of my research was to study the relationship between sport participation and physical activity levels and mental health in rural, low-income, high school students. This sample group was chosen specifically because adolescents from low-income backgrounds have elevated risk for mental and physical health disparities.<sup>5</sup> Little research, however, has been conducted in this population.

Wellness fairs were hosted at four Title I high schools. A total of 253 10<sup>th</sup> and 11<sup>th</sup> grade students participated (114 males, 139 females). This study was approved by the IRB (Protocol 18-109 MR 1803); parental consent was obtained prior to each fair. Participants completed the PROMIS<sup>®</sup> Pediatric Anxiety,<sup>6</sup> Pediatric Depressive Symptoms,<sup>6</sup> Psychological Stress Experiences,<sup>7, 8</sup> Physical Stress Experiences,<sup>7</sup> and Physical Activity<sup>9</sup> questionnaires. Additionally, students completed the FITNESSGRAM<sup>®</sup> physical fitness testing, which consisted of anthropometrics (height, weight, body mass index [BMI]), body composition (% fat mass, % lean mass), resting heart rate (RHR), blood pressure, muscular strength and endurance (push-ups, curl-ups), and aerobic capacity (Progressive Aerobic Cardiovascular Endurance Run [PACER]). Body composition was measured using a TANITA<sup>®</sup> total body composition analyzer (SC-331S Total Body Composition Analyzer, TANITA<sup>®</sup>) and blood pressure and heart rate were measured via an Omron<sup>®</sup> automatic blood pressure monitor (5 Series Upper Arm Blood Pressure Monitor BP742N, Omron Healthcare).

Stepwise linear regression was used to examine the influence of sex and race on sport participation and physical activity. Additional stepwise linear regressions were used to examine the influence of sex, race, physical activity, and number of sports on mental and physical health measures.

Contrary to our hypotheses, females reporting greater physical activity levels reported higher anxiety symptoms ( $p = .02$ ). The same was true for one-sport ( $p < .01$ ) and multisport ( $p < .01$ ) females showing greater depressive symptoms. Though Caucasian/white adolescents showed lower depressive ( $p < .05$ ) and psychological stress ( $p < .01$ ) symptoms with greater number of sports, non-white adolescents showed no relationship. These results suggest other factors are contributing to higher mental health burdens in this population. Moreover, 36.4% of students reported moderate or severe anxiety symptoms, 36.0% reported moderate or severe depressive symptoms, and 28.1% reported high or very high psychological stress symptoms. Sport participation was related to improved physical fitness measures (i.e., systolic blood pressure [ $p = .04$ ], RHR [ $p < .001$ ], push-ups [ $p < .01$ ], curl-ups [ $p = .02$ ], and PACER test [ $p < .01$ ]) suggesting sport participation may be a way for rural, low-income, adolescents to improve physical health outcomes. Yet according to BMI, 15.8% of participants were overweight and 23.3% were obese. Results suggest the need for further examination of these relationships in the present population.

## Statement of Research Advisor

Sarah Beth Dolinger is a current undergraduate research fellow (2018-2020). Over the course of her second year fellowship (2019-2020), Sarah Beth was a major contributor to the management of the Wellness Fair program, including disseminating information to the schools, distributing and collecting consent forms, as well as managing data collection and data archiving.

She contributed to the data analysis for the present study and the interpretation of the study results for publication. Sarah Beth has presented these results at the Student Research Symposium at Auburn University, as well as at two national conferences (National Conference on Undergraduate Research and the annual meeting of the North American Society for Psychology of Sport and Physical Activity).

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