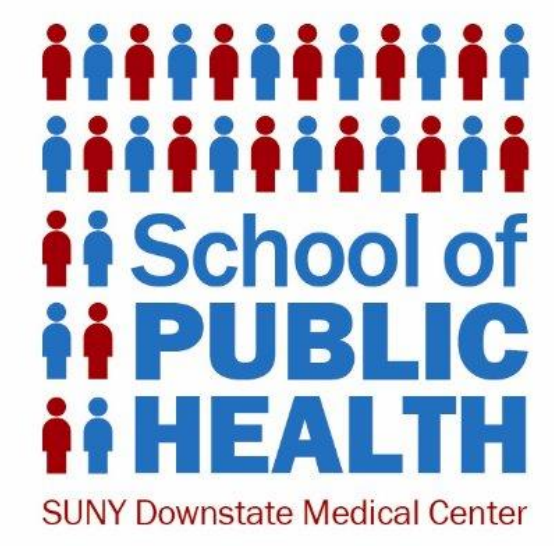




The Association Between Concussions and Academic Performance in U.S. Adolescents

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BACKGROUND

- About 1.1 to 1.9 million concussions occur in American youth annually due to sports
- Ages 15-24: sports are a leading cause of traumatic brain injuries
- Return to school and impacts on academic performance are concerns for concussed students
- High school academic achievement is important when pursuing higher education in the U.S
- Mixed results and limitations to current literature, need to evaluate this association given prevalence of concussions in adolescents and importance of high school grades

OBJECTIVE

To evaluate the association between concussions and academic performance in U.S high school students

METHODS

YOUTH RISK BEHAVIOR SURVEY (YRBS): Surveyed 136 U.S public and private high schools in 2019 to determine the prevalence of health risk behaviors

STUDY DESIGN: Cross-sectional, n=10,389 (5589 males, 5859 females)

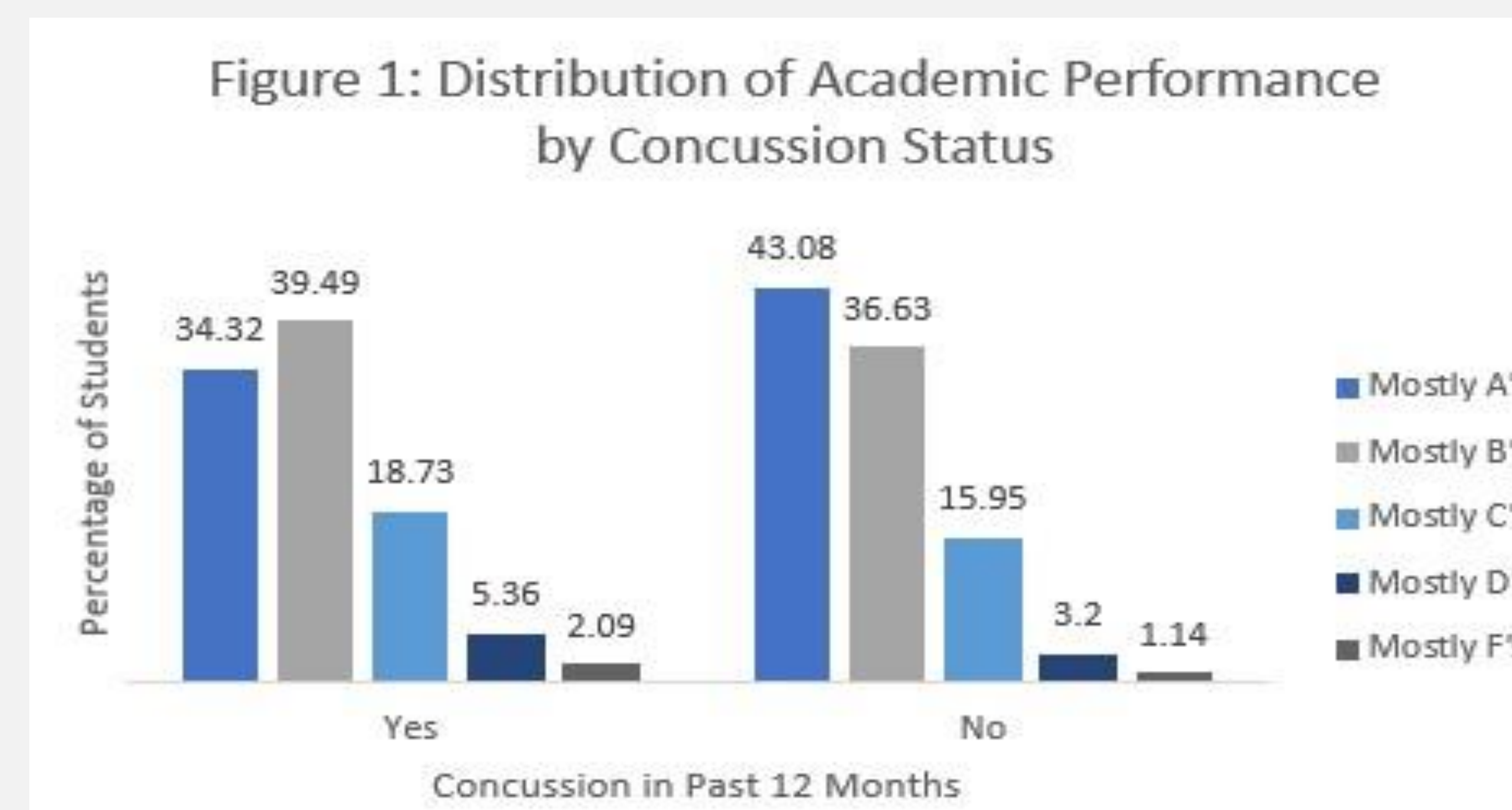
EXPOSURE: i) Concussion presence vs. absence in past 12 months, ii) ≥ 2 vs. 1 concussion

OUTCOME: i) High academic performance (mostly A's and B's) vs. low (mostly C's, D's, F's) in past 12 months, ii) categorical grades

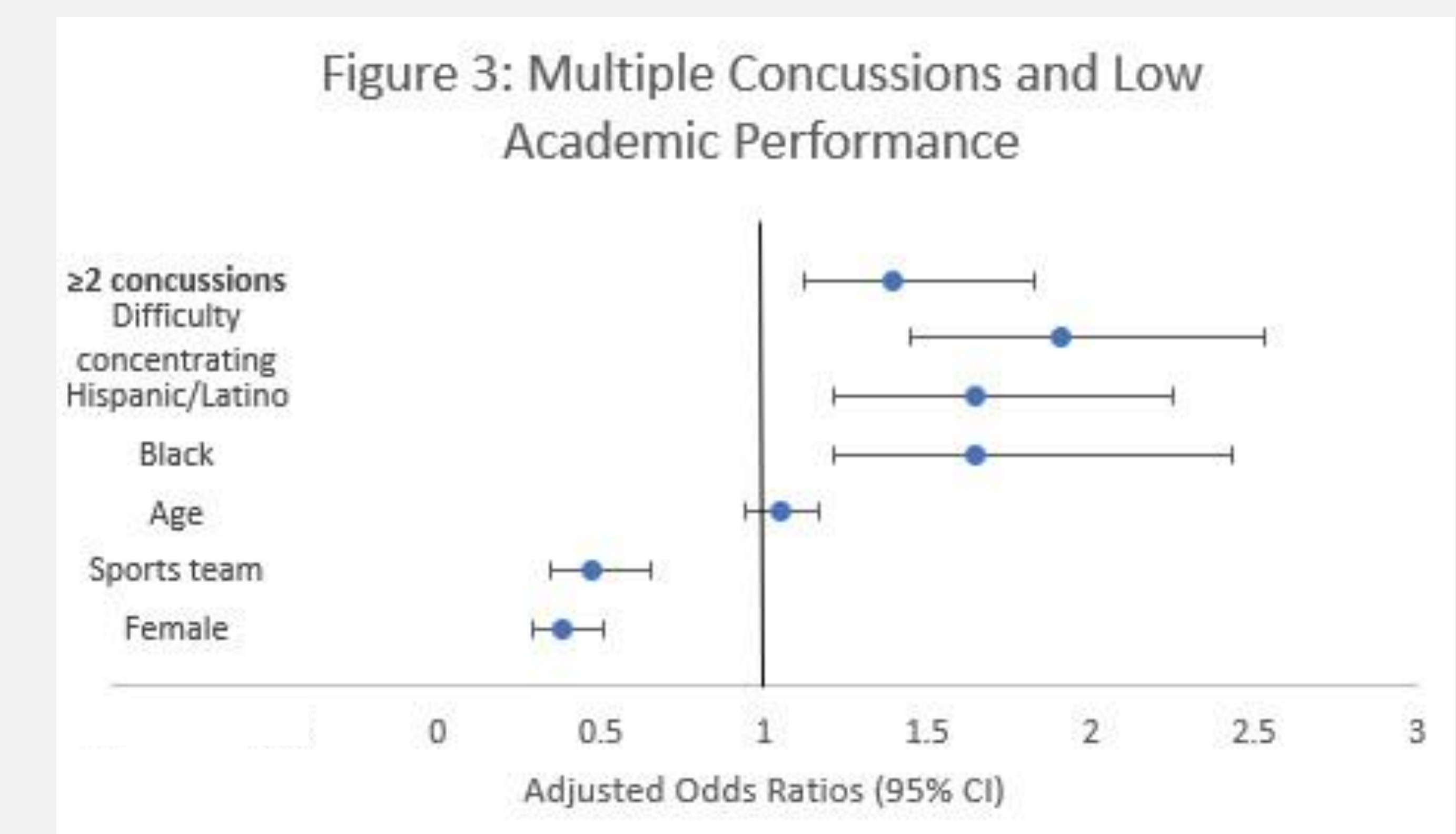
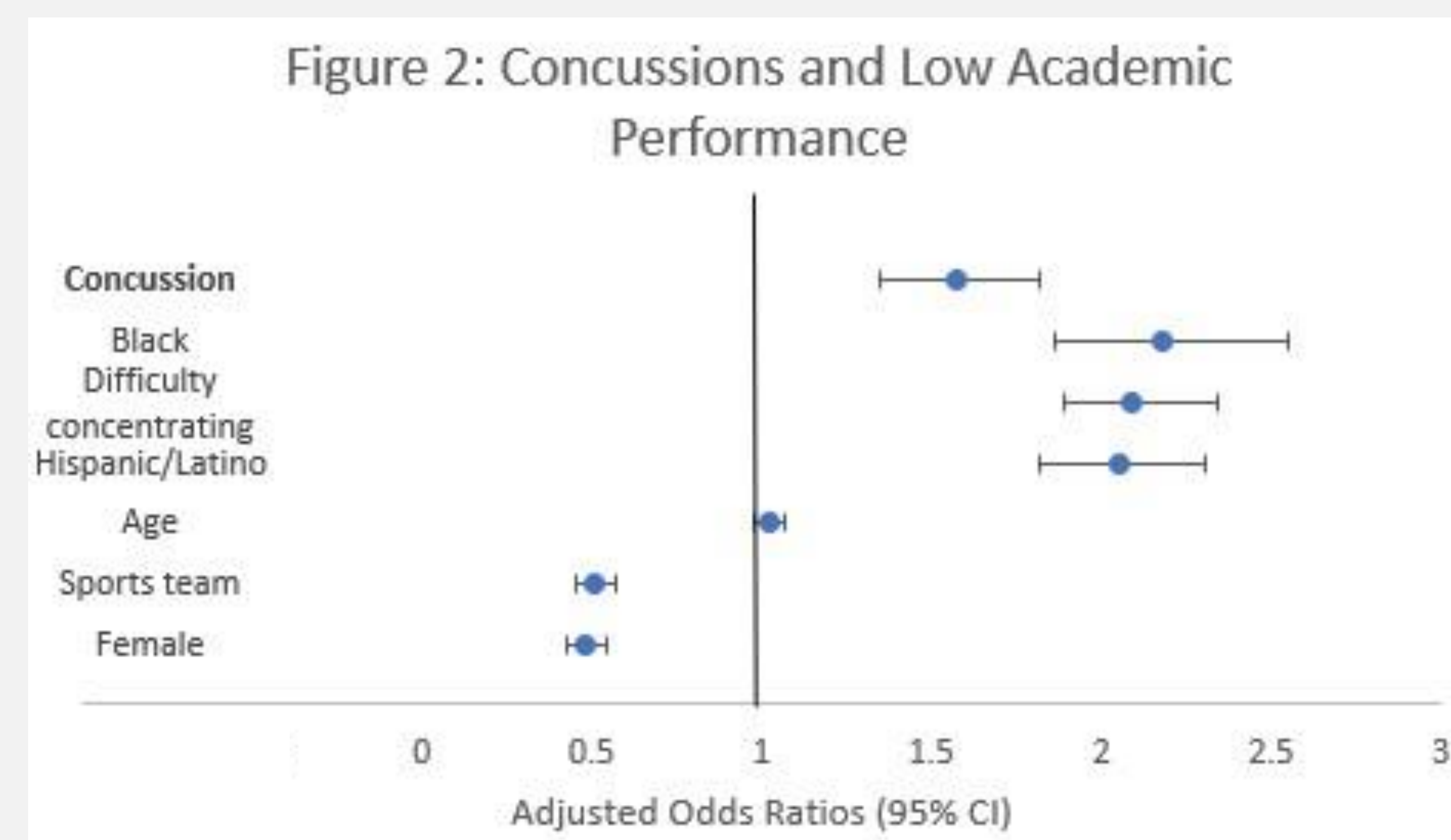
ADDITIONAL VARIABLES: Gender, age, race/ethnicity, sports team membership, difficulty concentrating

STATISTICAL ANALYSIS: Logistic regression and multinomial logistic regression

RESULTS



- 15% (1623 students) had a concussion in past 12 months
- About 80% of students report mostly A's and B's
- Concussed students more likely to have lower grades than non-concussed students ($p < 0.001$)
- Students with ≥ 2 concussions more likely to have lower grades than those with 1 ($p < 0.001$)



- Concussed students have greater odds of lower grades than those w/out concussions (OR=1.53, 95% CI (1.31, 1.77)), as well as students with ≥ 2 concussions compared to those with one (OR=1.37, 95% CI (1.04, 1.80))
- Compared to non-concussed students, those with concussions have almost 3 times the odds of having mostly F's than A's (OR=2.75, 95% CI: (1.65, 4.60)).

CONCLUSIONS

- Association between concussions and lower academic performance found in a large, generalizable sample
- Implications for schools, healthcare professionals, college admissions process, and helmet standard committees to understand individualized nature of concussions and provide appropriate accommodations

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