

Analyzing the Relationship between Physical Fitness and Academic Achievement in Chinese High School Students

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Abstract : In China, under the considerable pressure of 'Gaokao' -the highly competitive college entrance examination, high school teachers and parents often worry that doing physical activity would take away the students' precious study time and may have a negative impact on the academic grades. There was a tendency to achieve high academic scores at the cost of physical exercise. Therefore, the purpose of this study was to examine the relationship between the physical fitness and academic achievement of Chinese high school students. The participants were 968 grade one (N=457) and grade two students (N=511) with an average age of 16 years from three high schools of different levels in Beijing, China. 479 were boys, and 489 were girls. One of the schools is a top high school in China, another is a key high school in Beijing, and the other is an ordinary high school. All analyses were weighted using SAS 9.4 to ensure the representatives of the sample. The weights were based on 12 strata of schools, sex, and grades. Physical fitness data were collected using the scores of the National Physical Fitness Test, which is an annual official test administered by the Ministry of Education in China. It includes 50m run, sits and reach test, standing long jump, 1000m run (for boys), 800m run (for girls), pull-ups for 1 minute (for boys), and bent-knee sit-ups for 1 minute (for girls). The test is an overall evaluation of the students' physical health on the major indexes of strength, endurance, flexibility, and cardiorespiratory function. Academic scores were obtained from the three schools with the students' consent. The statistical analysis was conducted with SPSS 24. Independent-Samples T-test was used to examine the gender group differences. Spearman's Rho bivariate correlation was adopted to test for associations between physical test results and academic performance. Statistical significance was set at $p < .05$. The study found that girls obtained higher fitness scores than boys ($p = .000$). The girls' physical fitness test scores were positively associated with the total academic grades ($r_s = .103$, $p = .029$), English ($r_s = .096$, $p = .042$), physics ($r_s = .202$, $p = .000$) and chemistry scores ($r_s = .131$, $p = .009$). No significant relationship was observed in boys. Cardiorespiratory fitness had a positive association with physics ($r_s = .196$, $p = .000$) and biology scores ($r_s = .168$, $p = .023$) in girls, and with English score in boys ($r_s = .104$, $p = .029$). A possible explanation for the greater association between physical fitness and academic achievement in girls rather than boys was that girls showed stronger motivation in achieving high scores in whether academic tests or fitness tests. More driven by the test results, girls probably tended to invest more time and energy in training for the fitness test. Higher fitness levels were associated with an academic benefit among girls generally in Chinese high schools. Therefore, physical fitness needs to be given greater emphasis among Chinese adolescents and gender differences need to be taken into consideration.

Keywords : physical fitness; adolescents; academic achievement; high school

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