



# Effects of Commuting Methods on the Physical Fitness in Middle School Students

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## ABSTRACT

**BACKGROUNDS:** The problem of physical weakness in Korean youth is getting worse with the admission-oriented education policies and reduced physical activity. **PURPOSE:** The purpose of this study was to investigate the effects of commuting methods on the body composition and physical fitness in middle school students. **METHODS:** 293 first-year middle school students (male: 155, female: 138) were recruited and classified according to their commuting methods, such as walking(Wik), bicycling(Bik) and vehicle movement(Vhc). Body composition including body mass index, muscle mass, fat mass, and abdominal fat, etc. was measured by 4-point bioelectrical impedance analysis. Sit-up, sidestep, sergeant jump, grip strength, sitting torso flexion test, and one-leg balance test were performed for measuring physical fitness. The strength of skeletal muscle was measured with MicroFet2 dynamometry. **RESULTS:** Total skeletal muscle mass, arm muscle mass, leg muscle mass, basal metabolic rate, grip strength, and sitting torso flexion were significantly higher in Bik group compared to the Vhc in male students( $p<0.05$ ). Waist-hip ratio and visceral fat mass were significantly lower in Wik group compared to the Vhc in female students ( $p<0.05$ ). Overall life patterns, such as weekly hours of physical education class, exercise hours after school, diet, and average sleeping hours, etc. were not significantly different in between groups ( $p<0.05$ ). **CONCLUSION:** The current study has shown that the active commuting itself can an effective physical activity to enhance the levels of physical fitness in the teenagers.

**KEYWORDS:** commuting method, physical activity, physical fitness, middle school students

## RESULTS

### Body Composition

#### male students

#### female students

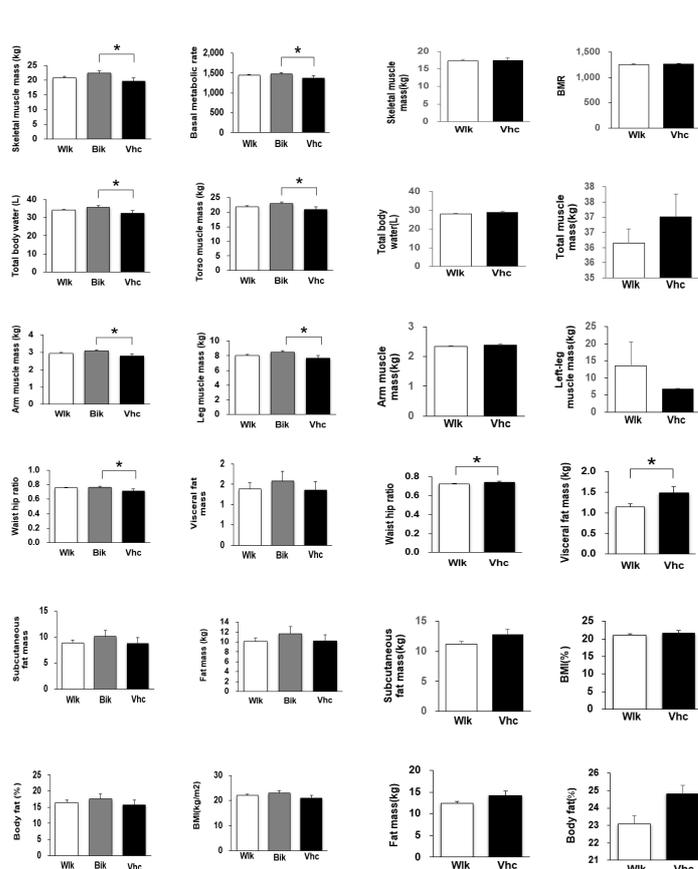
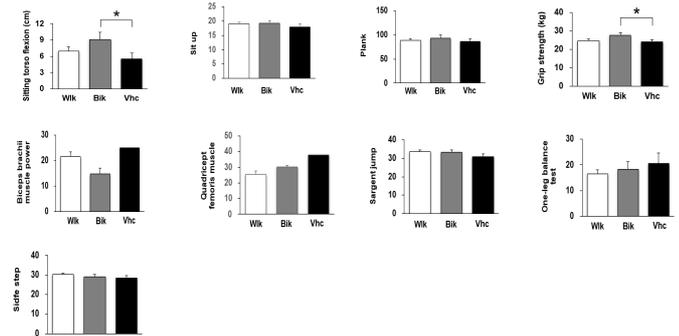


Figure 1. School commuting method for boys  
According to the survey, 78 male students (53.7 percent) go to school on foot, 14 male students go to school on their own. Name (21.3%); 36 male students (24.8%) using traffic; and in the case of female students, 92 female students (66.6%) use the beam, and 46 (33.3%) use the transportation. and no student went to school on his own.  
Wik: Walking, Bik: Bicycle, Vhc: Public transport  $p<0.05$

### Functional Fitness

#### male students



#### female students

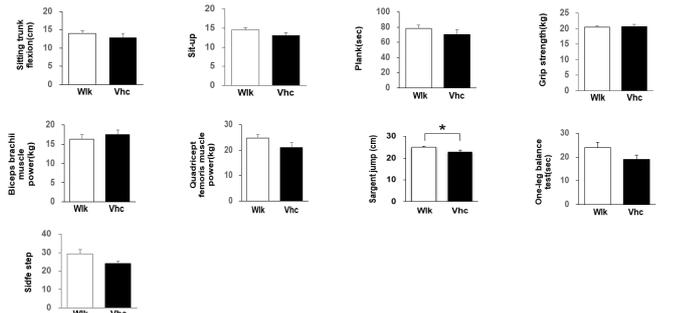


Figure 2. The comparison of male students' health strength showed that grip strength and groups that commute to school by bicycle from the left front tunnel were significantly higher than those who commute to school by transportation. Wik: Walking, Bik: Bicycle, Vhc: Public transport  $p<0.05$

## CONCLUSION

The above results showed that the effects of school methods on human body composition and health fitness factors were investigated and studied by investigating the lifestyle of male and female teenagers, and that groups that commute to school by walking and biking rather than those who commute by using traffic had an impact on human body composition and health stamina factors. And there was no significant difference between motility groups and non-motorized groups. Therefore, it has been shown that the way teenagers commute to school has a real effect on their physical fitness.