Changes in Cardiorespiratory Fitness, Body Composition, and Physical Activity of Women Aged 20 to 68 Years

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Previous studies have reported age-associated negative changes in cardiorespiratory fitness (CRF) and an age-associated decline in CRF in relation to race and gender differences. However, an age-associated decline in CRF in Korean women has not been fully reported, especially in association with age-related changes in their physical activity levels and body composition. Therefore, the purpose of this cross-sectional study was to evaluate age-associated changes in CRF, physical activity and body composition in healthy adult Korean women (n = 465, age range: 20-68yrs). Graded exercise test (GXT) for measuring CRF, BIA method for estimating body composition, and international physical activity questionnaire (IPAQ) for estimating physical activity were conducted. Regression results showed that CRF significantly changes when percent body fat and physical activity level are varied (p<0.05).This study resulted in significantly age-associated declines in moderate physical activity level (11.14 min/year), percent body fat (%BF) (0.13 %/year) and CRF (0.21 ml/kg/min/year). Multiple regression analysis showed that this cross-sectional decline in maximal oxygen uptake (VO2max) was due to age, %BF, sedentary physical activity, and moderate physical activity. Applying moderate physical activity to the multiple regression models were increased with age regression of VO2max at least 0.4 ml/kg/min/year. However, Applying %BF to the multiple regression models were increased with age regression of VO2max at least 0.4 ml/kg/min/year. However, Applying %BF to the multiple regression models were increased with age regression of VO2max at least 0.4 ml/kg/min/year. However, Applying %BF to the multiple regression models were increased with age.
regression models were reduced with age regression of VO_{2max} at least 0.38 ml/kg/min/year. Our results, therefore, suggested that increasing moderate activity level in adult women may reduce an age-associated change in % BF and may delay an age-associated decrease in CRF in Korean women.

**Key Words:** moderate physical activity, cross-sectional study, multiple regression model

**Introduction**

It has been known that regular physical activity (PA) is the main factor for maintaining healthy body regardless of age. Not only regular PA but also daily physical activity with low intensity (<3METs; Metabolic Equivalent score) have been also reported as more beneficial activity than sedentary life. Therefore, factors such as medical exam, nutritional intake, sleep habits, drinking, smoking and PA need to be continuously cared for maintaining health.

Regular PA with over moderate intensity is directly associated with maintain physical fitness and is effective for preventing cardiovascular disease factors and early death (LaMonte & Blair, 2006). Moreover, cardiorespiratory fitness (CRF) rather than other physical fitness factors is effective for lowering prevalence of early death and diseases such as cardiovascular disease, lung cancer, high blood pressure, type II diabetes, and dyslipoproteinemia (Blair et al., 1989; Ekelund et al., 1988; Sandvik et al., 1993; Stewart, 2005). According to Aerobic Center Longitudinal Study (ACLS), they examined 20-87 years old men and women for 20 years and they found that men need to do over moderate PA for 130-138 min and women for 148-147 per week to maintain CRF. Therefore they mentioned that women require more moderate PA than men to keep their physical health (Stofan, DiPietro, Davis, Kohl, & Blair, 1998). Also, it is emphasized that regular PA (intensity and volume) is important because regular PA caused CRF changes although age and body composition directly cause CRF changes ("Physical Activity Guidelines Advisory Committee report, 2008. To the Secretary of Health and Human Services. Part A: executive summary," 2009).