



# Exercise, Body Mass Index and Health Related Quality of Life in Korean People with Disabilities

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## Dear Editor-in Chief

People with disabilities are at risk for “secondary conditions,” preventable physical, mental, and social disorders problems that a persons with a primary disabling condition likely experiences (1). They often suffer from chronic health conditions such as comorbidities, psychosocial problems, and low health-related quality of life (HRQOL) (2). Regular exercise participation among people with disabilities improves self-confidence, self-esteem, and quality of life, as well as performance of activities of daily living (3).

We aimed to investigate the association between exercise participation, weight-status and parameters of health-related quality of life (HRQoL) of people with disabilities in South Korea. We used the data from the 2017 National Survey of disabled people (NSDP). A total of 6,549 peoples of disabilities (physical, brain, visual, auditory, linguistic, facial, renal, heart, live, respiratory, intestinal and urinary, epilepsy, mental, developmental, mental impairment) were eligible for this study (Table 1).

**Table 1:** Demographic characteristics of person with disabilities according to sex

<i>Variables</i>	<i>Total (N= 5,839)</i>	<i>Men (N=3,331)</i>	<i>Women (N=2,508)</i>
Demographic			
Age(year)	62.8±15.4	60.9±15.1	65.4±15.4
Height(cm)	162.6±14.3	168.0±6.8	155.3±17.9
Weight(kg)	63.0±24.2	67.1±19.7	57.6±28.3
BMI(kg/m <sup>2</sup> )	23.8±7.6	23.7±6.2	23.8±9.1
Education Level			
≤Elementary	2472 (42.3)	973(29.2)	1499(59.8)
Middle school	946 (16.2)	598(18.0)	348(13.9)
High School	1621 (27.8)	1155(34.7)	466(18.6)
≥College	800 (13.7)	605(18.2)	195(7.8)
Severity of Disability			
Mild	3870(66.3)	2133(64.0)	1737(69.3)
Severe	1969(33.7)	1198(36.0)	771(30.7)
Weight Status			
Normal weight	3785(65.0)	2218(66.7)	1567(62.7)
Under weight	289(5.0)	146(4.4)	143(5.7)
Overweight	1747(30.0)	959(28.9)	788(31.5)

Values are mean ± SD or N (%)

Normal weight = 18.5-24.9(BMI), underweight = <18.5(BMI), overweight = > 25.0(BMI)

Body mass index (BMI; kg/m<sup>2</sup>) was calculated using self-reported height and weight which was then classified into three groups based on the Asia-Pacific BMI classification: 1) underweight; <18.5 kg/m<sup>2</sup>, 2) normal weight; 18.5-24.9 kg/m<sup>2</sup>, 3) overweight; ≥ 25.0 kg/m<sup>2</sup>. Exercise frequency was collected by using self-reported questionnaires. Participants were asked the following questions: “On how many of the past one year did you engage in physical exercises (walking/jogging, free-exercise, cycle, weight training, hiking, swimming and others)?”. HRQOL was measured by the Korean version of the EuroQOL 5-Dimension questionnaire (EQ-5D).

All statistical analysis was performed using SPSS, Windows version 21.0 (SPSS Inc, Chicago, IL, USA). Descriptive analyses are presented for the demographic variables which were analyzed using weighted means ± standard deviation (SD) for continuous data and numbers (percentages) for categorical data. Logistic regression analyses were conducted to generate prevalence odds ratios (OR) with 95% confidence intervals (95%CI) for exercise frequency associated with parameter of HRQOL.

In normal weight status categories, those who did not participate in any physical exercise at least once/week was more likely to be having problems in mobility (OR=1.59, 95%CI=1.37-1.83), self-care (OR =1.78, 95%CI=1.50-2.10), usual activities (OR=1.55, 95%CI=1.35-1.79), pain/discomfort (OR=1.27, 95%CI=1.23-1.41), and anxiety/depression (OR=1.29, 95%CI=1.12-1.49), compare to those who participated in physical exercise at least once/week. In underweight and overweight status categories, those who did not participate in any physical exercise at least once/week was more likely to be having problems in mobility (underweight: OR=2.29, 95%CI =1.32-4.00; overweight: OR=1.39, 95%CI=1.12-1.72 ), self-care (underweight: OR =2.51, 95%CI=1.42-4.43; overweight: OR=1.41, 95%CI=1.09-1.80), usual activities (underweight: OR=2.33, 95%CI=1.38-3.93; overweight: OR=1.29, 95%CI=1.01-1.58), and anxiety/depression (underweight: OR=1.69, 95%CI=1.04-2.78; overweight: OR= 1.26, 95%CI=1.01-1.56), compare to those who participated in physical exercise at least once/week (Table 2).

**Table 2:** Exercise participation and health-related quality of life variables by weight-status in people with disabilities

Variables	Normal weight		Underweight		Overweight	
	≥1-day/week* (n=2,372)	No exercise^ (n=1,413)	≥1-day/week* (n=132)	No exercise^ (n=157)	≥1day/week* (n=1,066)	No exercise^ (n=681)
<b>Adjusted OR (95% CI)</b>						
Mobility	1 [ref]	1.59(1.37-1.83)*	1 [ref]	2.29(1.32-4.00)*	1 [ref]	1.39(1.12-1.72)*
Self-care	1 [ref]	1.78(1.50-2.10)*	1 [ref]	2.51(1.42-4.43)*	1 [ref]	1.41(1.09-1.80)*
Usual Activities	1 [ref]	1.55(1.35-1.79)*	1 [ref]	2.33(1.38-3.93)*	1 [ref]	1.29(1.01-1.58)*
Pain/discomfort	1 [ref]	1.27(1.23-1.41)*	1 [ref]	1.45(0.86-2.45)	1 [ref]	1.15(0.93-1.43)
Anxiety/depression	1 [ref]	1.29(1.12-1.49)*	1 [ref]	1.69(1.04-2.78)*	1 [ref]	1.26(1.01-1.56)*

Values are odds ratio [95% confidence interval].

Normal weight = 18.5-24.9 (BMI), underweight= <18.5 (BMI), overweight = ≥ 25.0 (BMI).

\* Exercise participation frequency more than 1 day per week.

^ Completely no exerciser participation per week.

Complex sample multiple logistic regression analysis adjusted for age, sex, types of disability, education level, marital status and severity of disability. \*P<0.05

This study examined the cross-sectional associations between physical exercise participation,

weight status, and HRQOL in a large, representative sample of Korean people with disabilities. We found that exercise was consistently and favorably

associated with parameters of HRQOL such as mobility, self-care, usual activities, pain/discomfort and anxiety/depression in all weight groups after adjusting for covariates. Strengths of this study include the large sample size in which provides representative estimates of the population. Furthermore, by including parameter of HRQOL such as mobility, self-care, usual activities, pain/discomfort and anxiety/depression, this study expands our understanding of the associations between exercise and HRQOL among people with disabilities.

However, our study has several limitations. First, the exercise participation questionnaire used in this study had potential biases in our participants. In particular, exercise frequency using the self-reported measure could be more likely to be overestimated compared to the actual time spent in exercise. Second, though we observed the clear association between PA and parameter of HRQOL after adjusting for covariates, we were not able to infer causality.

In conclusion, this study provides evidence that exercise participation may improve HRQOL among people with disabilities in South Korea.

### **Conflict of interest**

The author declares that there is no conflict of interest.

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