

# Association of Body Mass Index with Direct Medical Cost of National Health Insurance Service in Apparently Healthy Koreans by age and sex

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**Introduction:** Medical costs increase with obesity. However, recent studies on this association in countries such as Korea, where the prevalence of obesity is relatively low, are rare. This study aimed to analyze the direct medical costs available according to the degree of obesity in relatively healthy Korean adults.

**Methods:** We included 1,170,464 adults (623,498 men and 546,966 women) aged  $\geq 19$  years (excluding patients with cancer) from the Korea National Health Insurance Service-National Sample Cohort database (2016–2019). Direct medical costs were defined as the total yearly costs (KRW, 1USD = 1,292 KRW) of health insurance services, and included all costs incurred for in- and outpatient care as well as medication use. The means and 95% confidence intervals (CIs) of predicted medical costs were analyzed according to the obesity classification using the two-part model. The sum of medical costs according to body mass index (BMI) quintile were analyzed using a t-test.

**Results:** The mean ages were  $48.1 \pm 13.8$  years for men and  $50.4 \pm 14.8$  years for women, respectively. Means of predicted direct medical cost were the lowest among normal weight (mean (95% CIs); 1,097,370 KRW (1,094,976–1,098,765)) and the highest among obese (1,233,593 KRW (1,330,093–1,333,252)). In men, direct medical costs were the lowest among overweight (1,110,010 KRW (1,107,975–1,112,045)), and the highest among underweight (1,605,183 KRW (1,603,092–1,607,274)). In women, direct medical costs increased as BMI increases. In adult aged  $\geq$

45 years, direct medical costs were the highest among underweight, followed by obese, overweight, and normal weight.

**Conclusion:** Our study demonstrated that, as body mass index increased, direct medical costs also increased. Therefore, the prevention of obesity in Korean adults should be reinforced to reduce national medical costs.

**Keywords:** direct medical cost; hospital cost; medication cost; Korean; obesity