



Association between Weight Control Behaviors and Health-related Quality of Life in Korean Adults

Sat Byul Park*

Department of Family Practice and Community Health, Ajou University School of Medicine, Korea

ABSTRACT

Background: Increasing evidence suggests that obesity is associated with a reduction in Health-Related Quality of Life (HRQL). HRQL is a widely used measure for assessing the degree of impairment in psychosocial and physical functions associated with disease states. This study aimed to examine the association between weight control behaviors and HRQL in Korean adults without diabetes.

Methods: This study used data from the 2017 Korea National Health and Nutrition Examination Survey. A total of 3,575 adults without diabetes were selected and divided into four groups according to their weight control behavior: Trying to lose weight, trying to maintain weight, trying to gain weight, and not trying to control weight. HRQL was evaluated using the EuroQol five-dimensional (EQ-5D) questionnaire. The EQ-5D consists of five multiple-choice questions and one subjective health level. Health status was determined with respect to the following five dimensions: Mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. The participants were asked to choose one of the following three responses: "No problem at all," "There are some problems," or "There are many problems."

Results: A statistically significant difference in the EQ-5D index score was observed among the four groups before and after controlling for age, sex, and Body Mass Index (BMI). ANOVA and Tukey's post-hoc test showed that the "trying to maintain weight" group had the highest EQ-5D index score. The "trying to lose weight" group had the second highest EQ-5D index score, followed by the "not trying to control weight" group, whereas the "trying to gain weight" group had the lowest EQ-5D index score (p -value compared with the "trying to maintain weight" group=0.053, 0.001, and 0.002, respectively).

Conclusion: Participants trying to maintain their weight had the best quality of life. Individuals who are interested in their health tend to have a high quality of life. Conversely, individuals who are not interested in their health, such as those who are not trying to control their weight, tend to have a low quality of life. Furthermore, underweight individuals are against health promotion.

Keywords: Weight control behaviors; Health-related quality of life; EuroQol five-dimensional (EQ-5D) questionnaire

ABBREVIATIONS

(HRQL) Health-Related Quality of Life; (EQ-5D) EuroQol Five-Dimensional; (BMI) Body Mass Index; (WCBs) Weight Control Behaviors

INTRODUCTION

Weight Control Behaviors (WCBs) are strategies used to lose weight or prevent future weight gain and can range from healthy to unhealthy [1]. Increasing evidence suggests that obesity is associated with a reduction in Health-Related Quality

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Corresponding author Sat Byul Park, Department of Family Practice and Community Health, Ajou University School of Medicine, Korea, E-mail: sbpark@ajou.ac.kr

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of Life (HRQL) [2-4]. HRQL is a multidimensional construct that examines the impact of diseases on areas of functioning and is a widely used measure for assessing the degree of impairment in psychosocial and physical functions associated with disease states [5-7]. Previous studies have shown that physical inactivity and obesity each have a negative impact on HRQL outcomes, with the greatest effect seen on the physical dimensions of HRQL [8-10]. WCBs mediate the relationship between weight status and disease-specific HRQL. The Diabetes Prevention Program lifestyle intervention resulted in improved HRQL among participants in the areas of general health, physical function, body pain, and vitality [11]. However, the relationship between other WCBs (e.g., trying to maintain weight, not trying to control weight, or trying to gain weight) and HRQL is still unclear. This study examined the relationship between WCBs and HRQL in adults without diabetes. This study hypothesized that individuals who are interested in their health, such as those who are trying to maintain their weight or lose weight, would have a high quality of life, and individuals who are not interested in their health, including those who are trying to gain weight or not trying to control their weight, would have a relatively low quality of life. This means that low physical activity would be associated with poor control of physical condition and a reduced quality of life. Furthermore, underweight individuals would also have a reduced quality of life.

MATERIALS AND METHODS

Study Population

This study used data from the 2017 Korea National Health and Nutrition Examination Survey. Data were collected from Korean adults aged 19 years-80 years. Participants diagnosed with or receiving medication for diabetes or with hypoglycemia (blood glucose levels <70 mg/dL), those who had a disability, those with a history of smoking, female participants who were pregnant, and participants with missing data were excluded. The final data were obtained from 1,212 men and 2,325 women (Figure 1).

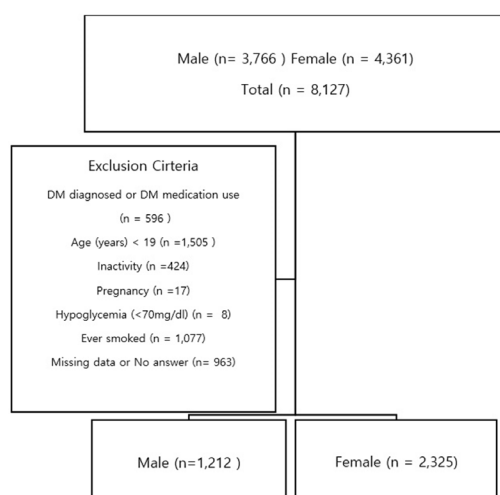


Figure 1: Flow chart on inclusion process of study population

Analysis of Variables

The study population was divided into four groups according

to their WCBs: Trying to lose weight, trying to maintain weight, trying to gain weight, and not trying to control weight. HRQL was evaluated using the EuroQol Five-Dimensional (EQ-5D) questionnaire [5]. The EQ-5D consists of five multiple-choice questions and one subjective health level. Health status was determined with respect to the following five dimensions: Mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. The participants were asked to choose one of the following three responses: “No problem at all,” “There are some problems,” or “There are many problems.” The responses to the five questions were evaluated using a score conversion system and expressed as a point between 1 (excellent health) and -1 (health like death).

Statistical Analysis

Continuous variables among the baseline characteristics were analysed using the t-test, and nominal variables were analysed using the chi-square test. ANCOVA was used to correct for confounding variables. ANOVA and Tukey’s post-hoc test were performed to compare the four groups. IBM SPSS Statistics (version 21.0; IBM Co., Armonk, NY, USA) was used for statistical analysis, and statistical significance was set at $p < 0.05$.

RESULTS

Baseline Characteristics

A total of 3,575 participants comprised 1,212 (33.90%) men and 2,325 (65.03%) women (Figure 1). The baseline characteristics of the study participants are shown in Table 1. The average age of male participants was 44.2 years, and that of female participants was 49.4 years. The body weights and smoking and alcohol consumption rates of men were higher than that of women.

Table 1: Baseline characteristics of the participants

	Men (n=1,212)	Women (n=2,325)	p-Value
Age (years)	44.19 ± 0.45	49.41 ± 0.33	<0.001
Waist circumference (cm)	85.35 ± 0.27	77.45 ± 0.20	<0.001
BMI (kg/m ²)	24.35 ± 3.49	23.24 ± 3.54	<0.001
Sedentary hours a day (h)	8.20 ± 0.11	7.97 ± 0.07	0.052
Smoking rate (%)	707 (58%)	110 (4%)	<0.001
Binge drinking frequency	0	0	<0.001
0/month	368 (10.4%)	1670 (47.2%)	
<1/month	203 (5.7%)	314 (8.9%)	
1/month	226 (6.4%)	188 (5.3%)	0
1/week	277 (7.8%)	132(3.7%)	
Always	138 (3.9%)	21 (0.6%)	

Values are presented as mean ± standard error. The mean and standard error values are estimates that reflect complex sample weights.

The p-values represent differences between men and women according to the t-test for continuous variables and the chi-square test for nominal variables.

(BMI) Body Mass Index

EQ-5D Scores of the Participants

The stress awareness rate was 0.29 for men and 0.28 for women. The EQ-5D index score was 0.97 for men and 0.95 for women, and the difference was statistically significant ($p < 0.001$). The scores for the EQ-5D health status dimensions were statistically significantly different between men and women, except for the self-care dimension (Table 2).

Table 2: EQ-5D scores of the participants

	Men (n=1212)	Women (n=2325)	p-Value
Stress awareness rate	0.29 ± 0.46	0.28 ± 0.45	0.475
EQ-5D index	0.97 ± 0.08	0.95 ± 0.10	<0.001
EuroQoL: Anxiety/depression	1.06 ± 0.25	1.09 ± 0.30	0.001
EuroQoL: Mobility	1.08 ± 0.28	1.13 ± 0.35	<0.001
EuroQoL: Usual activities	1.04 ± 0.20	1.06 ± 0.25	0.002
EuroQoL: Self-care	1.02 ± 0.16	1.03 ± 0.17	0.52
EuroQoL: Pain/discomfort	1.16 ± 0.39	1.28 ± 0.50	<0.001

Values are presented as mean ± standard deviation. The mean and standard deviation values are estimates that reflect complex sample weights.

The p-values represent differences between men and women according to the t-test for continuous variables. (EQ-5D) EuroQoL Five Dimensions.

Mean EQ-5D Score According to WCBs

The “trying to lose weight” group had the highest Body Mass Index (BMI), whereas the “trying to gain weight” group had the lowest BMI ($p < 0.001$) (Table 3). A statistically significant difference in the EQ-5D index score was observed among the four groups before and after controlling for age, sex, and BMI

Table 3: EQ-5D scores according to weight control behaviors

	Group 1 (n=1507)	Group 2 (n=689)	Group 3 (n=184)	Group 4 (n=1195)	p-Value	p-Value*
BMI (kg/m ²)	24.91 ± 3.47	22.83 ± 3.01	20.18 ± 2.50	22.97 ± 3.46	<0.001	0
Stress awareness rate	0.30 ± 0.46	0.24 ± 0.43	0.30 ± 0.46	0.29 ± 0.45	0.037	0.035
EQ-5D index	0.96 ± 0.09	0.97 ± 0.08	0.94 ± 0.17	0.95 ± 0.10	<0.001	<0.001
EuroQoL: Anxiety/depression	1.09 ± 0.29	1.05 ± 0.22	1.11 ± 0.33	1.08 ± 0.30	0.007	0.005
EuroQoL: Mobility	1.10 ± 0.31	1.07 ± 0.27	1.16 ± 0.40	1.13 ± 0.35	<0.001	<0.001
EuroQoL: Usual activities	1.05 ± 0.23	1.04 ± 0.20	1.08 ± 0.29	1.07 ± 0.26	0.039	0.011
EuroQoL: Self-care	1.02 ± 0.16	1.01 ± 0.13	1.05 ± 0.24	1.04 ± 0.20	0.007	0.003
EuroQoL: Pain/discomfort	1.24 ± 0.47	1.21 ± 0.44	1.29 ± 0.51	1.25 ± 0.47	0.147	0.002

Values are presented as mean ± standard deviation. The mean and standard deviation values are estimates that reflect complex sample weights. The p-values represent differences among groups according to ANOVA for continuous variables.

*After controlling for age, sex, and BMI.

(Group 1) trying to lose weight; (Group 2) trying to maintain weight; (Group 3) trying to gain weight; (Group 4) not trying to control weight; (BMI) Body Mass Index; (EQ-5D) EuroQoL Five Dimensions

($p < 0.001$). ANOVA and Tukey’s post-hoc test showed that the “trying to maintain weight” group had the highest EQ-5D index score. The “trying to lose weight” group had the second highest EQ-5D index score, followed by the “not trying to control weight” group, whereas the “trying to gain weight” group had the lowest EQ-5D index score (p -value compared with that of the “trying to maintain weight” group=0.053, 0.001, and 0.002, respectively) (Figure 2).

DISCUSSION

Physical activity contributes to multiple domains of quality of life. In a study using an open-ended questionnaire, Gill et al. found that physical activity contributed not only to the physical but also to the social and spiritual domains of quality of life [12]. Studies in the general population have consistently shown a positive association between self-reported physical activity and HRQL [13]. The present study demonstrated that individuals interested in their health, such as those trying to maintain or lose weight, tend to have a higher quality of life. Conversely, individuals not interested in their health, such as those not trying to control their weight, tend to have a lower quality of life. Based on structural equation modelling, Maddigan et al. observed a positive relationship between exercise adherence and HRQL [14]. In addition, another study in Korean adults showed that increased physical activity levels were associated with reduced prevalence or odds of poor self-rated health across all age and sex groups in both healthy and physically impaired or chronically ill individuals [15]. In the current study, individuals with a higher BMI attempted to lose weight. In contrast, those with a lower BMI attempted to gain weight. In a large US adult population study, an underweight status and increasing levels of overweight/obesity were negatively associated with self-rated health [16]. Underweight individuals have a considerably low HRQL owing to various factors, such as reduced energy levels, increased risk of illness, reduced strength, decreased bone density, and weight-related emotional disturbance.

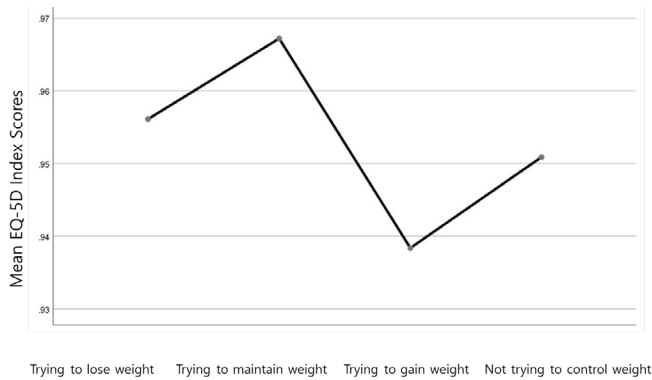


Figure 2: Mean EQ-5D Index Scores by weight control behaviors

High levels of chronic stress have been shown to cause short-term endocrine changes, such as disrupted regulation of the hypothalamic-pituitary-adrenal axis and increased levels of glucocorticoids, which may lead to prolonged physiological consequences even after the disappearance of the stressor. A positive association between obesity and plasma cortisol levels has been well documented [17,18]. Excess food intake has been reported among individuals with high-stress levels, and a study has suggested that stress inhibits satiety [19]. The strength of this study is that it is the first to investigate HRQL according to WCBs in Korean adults. However, this study also had some limitations. First, cross-sectional data were used to investigate the relationship between weight status and HRQL. A longitudinal investigation is needed to make assumptions about the causality of the associations found. Second, the confounding variables corrected for using ANCOVA were selected basis on pre-existing knowledge about the social and biological determinants of weight. Therefore, not all potential confounders were measured.

CONCLUSION

Individuals who are interested in their health tend to have high EQ-5D index scores and that healthy lifestyle changes improve their overall health and quality of life. In contrast, individuals who are not interested in their health, such as those not trying to control their weight, tend to have a low quality of life. Furthermore, underweight individuals are against health promotion.

DECLARATIONS

The authors declare no conflict of interest.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All methods were carried out in accordance with relevant guidelines and regulations. All participants provided written informed consent for participation in the study. All experimental protocols were approved by Korea Centres for Disease Control and Prevention Chronic Disease Management Bureau Health and Nutrition Survey Analysis Division.

CONSENT FOR PUBLICATION

Not Applicable.

AVAILABILITY OF DATA AND MATERIALS

The author confirmed that the data supporting the findings of this study are available within the article and its supplementary materials. Derived data supporting the findings of this study are available from the corresponding author on request. There is no restrictions on data access.

COMPETING INTERESTS

The author has no competing interests.

FUNDING

Not Applicable.

AUTHOR'S CONTRIBUTIONS

SBP conceptualized the design of the study, provided logistic support for patient selection and recruitment and lead the data collection, and wrote the first draft of the manuscript. She provided intellectual input in the development of the article, has read and approved the manuscript.

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AUTHOR'S INFORMATION

Department of Family Practice and Community Health, Ajou University School of Medicine, Suwon, Korea.

REFERENCES

- Jia H, Lubetkin EI (2005) The impact of obesity on health-related quality-of-life in the general adult US population. *J Public Health (Oxf)*. 27(2):156-64.
- Palermo TM, Long AC, Lewandowski AS, Drotar D, Quittner AL, et al. (2008) Evidence-based assessment of health-related quality of life and functional impairment in pediatric psychology. *J Pediatr Psychol*. 33(9):983-996.
- Neumark-Sztainer D, Story M, Hannan PJ, Croll J (2002) Overweight status and eating patterns among adolescents: Where do youths stand in comparison with the healthy people 2010 objectives? *Am J Public Health*. 92(5):844-851.
- Ford ES, Moriarty DG, Zack MM, Mokdad AH, Chapman DP (2001) Self-reported body mass index and health-related quality of life: Findings from the behavioral risk factor surveillance system. *Obes Res*. 9(1):21-31.
- Larsson U, Karlsson J, Sullivan M (2002) Impact of overweight and obesity on health-related quality of life-a Swedish population study. *Int J Obes Relat Metab Disord*. 26(3):417-424.
- Heo M, Allison DB, Faith MS, Zhu S, Fontaine KR (2003) Obesity and quality of life: Mediating effects of pain and comorbidities. *Obes Res*. 11(2):209-216.
- Engel SG, Adair CE, Hayas CL, Abraham S (2009) Health-re-

- lated quality of life and eating disorders: A review and update. *Int J Eat Disord.* 42(2):179-187.
8. Fidler JA, Shahab L, West O, Jarvis MJ, McEwen A, et al. (2011) 'The smoking toolkit study': A national study of smoking and smoking cessation in England. *BMC Public Health.* 11:479.
 9. Minet Kinge J, Morris S (2010) Socioeconomic variation in the impact of obesity on health related quality of life. *Soc Sci Med.* 71(10):1864-1871.
 10. Fontaine KR, Barofsky I (2001) Obesity and health-related quality of life. *Obes Rev.* 2(3):173-182.
 11. Florez H, Pan Q, Ackermann RT, Marrero DG, Barrett-Connor E, et al. (2012) Impact of lifestyle intervention and metformin on health-related quality of life: The diabetes prevention program randomized trial. *J Gen Intern Med.* 27(12):1594-1601.
 12. Gill DL, Hammond CC, Reifsteck EJ, Jehu CM, Williams RA, et al. (2013) Physical activity and quality of life. *J Prev Med Public Health.* 46 (Suppl 1):S28-S34.
 13. Bize R, Johnson JA, Plotnikoff RC (2007) Physical activity level and health-related quality of life in the general adult population: A systematic review. *Prev Med.* 45(6):401-415.
 14. Maddigan SL, Majumdar SR, Johnson JA (2005) Understanding the complex associations between patient-provider relationships, self-care behaviours, and health-related quality of life in type 2 diabetes: A structural equation modeling approach. *Qual Life Res.* 14(6):1489-500.
 15. Han MA, Kim KS, Park J, Kang MG, Ryu SY (2009) Association between levels of physical activity and Korean adults: The third Korea national health and nutrition examination survey (KNHANES), 2005. *Public Health.* 123(10):665-669.
 16. Imai K, Gregg EW, Chen YJ, Zhang P, de Rekeneire N, et al. (2008) The association of BMI with functional status and self-rated health in US adults. *Obesity (Silver Spring).* 16(2):402-408.
 17. Tamashiro KL, Hegeman MA, Sakai RR (2006) Chronic social stress in a changing dietary environment. *Physiol Behav.* 89(4):536-542.
 18. Kalra SP, Kalra PS (2004) NPY and cohorts in regulating appetite, obesity and metabolic syndrome: Beneficial effects of gene therapy. *Neuropeptides.* 38(4):201-211.
 19. Wallis DJ, Hetherington MM (2009) Emotions and eating. Self-reported and experimentally induced changes in food intake under stress. *Appetite.* 52(2):355-362.