

Obesity Associated with Reduced Physical Health but Not Mental Health

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There is an increasing prevalence of obesity worldwide. It was projected that, by the year 2030, the absolute number of obese adults would reach a total of 1.12 billion, or 20% of the world's adult population.¹ In Singapore, the prevalence of obesity (body mass index (BMI) $\geq 30.0 \text{ kgm}^2$) among residents aged 18-69 years increased from 6.0% in the year 1998 to 6.9% in the year 2004.² Being obese is associated with higher risk of mortality.³

Health related Quality of Life (HRQoL) is an important patient reported outcome that measures the effect of health condition on an individual's subjective evaluation of physical, social, and mental well being.⁴ Current studies reported conflicting results with regards to the impact of obesity on mental health, with studies reporting reduced,⁵ similar⁶ or improved⁷ mental health. Nevertheless, most studies appear to be consistent in reporting obesity being associated with reduced physical health.^{5, 8, 9}

With funding support from the NUS cross faculty grant (Principal Investigator: Dr Wee Hwee Lin, Department of Pharmacy, Faculty of Science; co-PI: A/P Jeannette Lee, Department of Epidemiology and Public Health, Yong Loo Lin School of Medicine; awarded May 2009) and using data from the Singapore Prospective Study Program (SP2) led by Principal Investigator A/P Tai E Shyong (Department of Medicine, Yong Loo Lin School of Medicine), Dr Wee and co-authors investigated the association between body mass index (BMI) and physical and mental HRQoL in Singapore. This study involved the analyses of cross-sectional data from 5027 Chinese, Malay and Indian Singaporean participants (2403 men and 2624 women) aged 24-95 years all of whom attended a medical examination and completed the Short-Form 36 (SF-36, a widely used questionnaire for assessing HRQoL) between 2004 and 2007. A statistical approach known as linear regression was performed with and without accounting for other variables that may be associated with the relationship between BMI and SF-36 physical component summary score (PCS) and mental component summary score (MCS). and found that obesity impaired physical well-being (measured using the physical component summary score of the Short Form-36 (SF-36), a well-established HRQoL measure). The effect of which was modified by sex but not ethnicity, such that the effect was greater in women than in men. Hence, efforts to reduce or prevent obesity are likely to have similar benefits in all ethnic groups, at least in Singapore. However, obesity was not associated with mental well-being (measured using the mental component summary score of the SF-36).

An important strength of this study lies in the large sample size. In addition, weight and height were measured rather than self-reported (common in other published studies), with underreporting of weight and overreporting of height being common among obese individuals.¹⁰ Nevertheless, the cross-sectional nature of this study limited our ability to test the causal association between BMI and HRQoL. Hence, the group hopes to conduct a longitudinal follow-up study in the near future to ascertain the causative relationship between BMI and HRQoL.

A manuscript reporting these findings has been accepted for publication by the *International Journal of Obesity* in January 2010 and this represents one of the few studies in Asia Pacific on this issue.

1. Kelly T, Yang W, Chen CS, Reynolds K, He J. Global burden of obesity in 2005 and projections to 2030. *Int J Obes (Lond)*. Sep 2008;32(9):1431-1437.
2. Epidemiology & Disease Control Division. National Health Survey 2004. In: Ministry of Health, ed2005.
3. Whitlock G, Lewington S, Sherliker P, et al. Body-mass index and cause-specific mortality in 900,000 adults: collaborative analyses of 57 prospective studies. *Lancet*. Mar 28 2009;373(9669):1083-1096.
4. Fontaine KR, Barofsky I. Obesity and health-related quality of life. *Obes Rev*. Aug 2001;2(3) 173-182.
5. Jia H, Lubetkin EI. The impact of obesity on health-related quality-of-life in the general adult US population. *J Public Health (Oxf)*. Jun 2005;27(2):156-164.
6. Han TS, Tjihuis MA, Lean ME, Seidell JC. Quality of life in relation to overweight and body fat distribution. *Am J Public Health*. Dec 1998;88(12):1814-1820.
7. Huang IC, Frangakis C, Wu AW. The relationship of excess body weight and health-related quality of life: evidence from a population study in Taiwan. *Int J Obes (Lond)*. Aug 2006;30(8): 1250-1259.
8. Tsai WL, Yang CY, Lin SF, Fang FM. Impact of obesity on medical problems and quality of life in Taiwan. *Am J Epidemiol*. Sep 15 2004;160(6):557-565.
9. Ford ES, Moriarty DG, Zack MM, Mokdad AH, Chapman DP. Self-reported body mass index and health-related quality of life: findings from the Behavioral Risk Factor Surveillance System. *Obes Res*. Jan 2001;9(1):21-31.
10. Kuskowska-Wolk A, Bergstrom R, Bostrom G. Relationship between questionnaire data and medical records of height, weight and body mass index. *Int J Obes Relat Metab Disord*. Jan 1992;16(1):1-9.