

## The Fat and Fit Myth

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You see an obese patient with normal vital signs, but you tell him, “You need to lose weight. Your bad cholesterol might be high already, making you at high risk for heart disease.” Then, you order for routine laboratory exams that include lipid profile and fasting blood glucose. They all come out normal! So, should you still tell your patient to lose weight?

“Metabolically healthy obesity” (MHO) is a medical condition characterised as in patients who are obese but without the metabolic abnormalities such as dyslipidemia, and impaired glucose tolerance. Though there is no universal definition for MHO, similar to standards of obesity (such as body mass index vs. Waist Circumference vs. Waist:Hip ratio, etc), whether this can actually decrease a patient’s risk for heart disease or decrease mortality is under debate.

In Northern Sweden, a substudy of the WHO Multinational MONItoring of Trends and Determinants in Cardiovascular Disease (MONICA) was conducted from 1986 to 2009 in 8,874 subjects to confirm whether the incidence of cardiovascular disease was decreasing despite increasing BMI. Metabolic health was defined as a total cholesterol level below 5.0 mmol/l, blood pressure below 140/90 mmHg and not having diabetes. By 2009 the age range was 25 to 74 years.

Results from the study showed the following: The prevalence of metabolic health among obese subjects reached 21.0% in 2009. For overweight subjects metabolic health increased to 18%, whereas for the normal-weight subjects, the increase was 39% in 2009. The prevalence of metabolic health among subjects with abdominal obesity reached 17.3% in 2009. Among those with no abdominal obesity the increase was 38% in 2009 ( $p = <0.001$  for all groups). Only among non-obese men and obese women did the increase continue between 2004 and 2009. In the other groups a slight decline or levelling off was noted.

A study done in Finland (Korhonen, P et al, 2015 ) which aimed to determine the lifestyle of MHO individuals showed that they were mostly women, cohabitating, slightly younger, more educated, took less alcohol and had more physical activity or exercise.

The Whitehall Cohort Study (2014), however, disputed the idea that MHO’s were at less risk for cardiovascular mortality. (Fig. 1) The study concluded that MHO have higher risk of CVD and this risk is no different with that in the metabolically unhealthy obese. This suggests that obesity outweighs the impact of metabolic status for risk of cardiovascular disease.

A meta-analysis (Eckel, N et al. 2015) was determined whether MHO or MHOVerweight conditions were actually “benign” conditions, rendering less cardiovascular mortality.

Restricting analysis only to studies

(Fig. 2) with at least 10 years of follow-up, the MHO group indeed had increased mortality and cardiovascular risk compared with the metabolically healthy normal-weight group (RR, 1.24; CI, 1.02 to 1.55; I<sup>2</sup> 33.6%). These data indicate that, with long- term follow-up, metabolically healthy obesity is associated with increased mortality and CV risk.

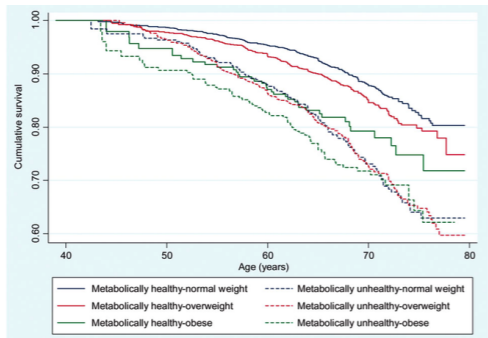


Fig. 1. Kaplan–Meier survival curves showing the association between body mass index-metabolic status phenotypes and cardiovascular disease events.

**METABOLICALLY HEALTHY OBESITY AND CARDIOVASCULAR EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS (BMI AND HOMA-IR)**

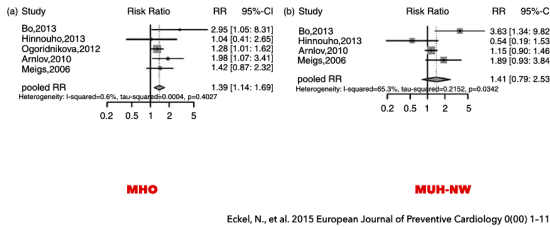


Fig. 2. Meta-analyses of risk for cardiovascular events of participants with (a) metabolically healthy obesity, (b) metabolically unhealthy normal weight compared with metabolically healthy normal-weight individuals; phenotypes defined by body mass index categories and a pre-defined cut-off for HOMA-IR.

defined by BMI, waist circumference and waist:height ratio. It was, however, mentioned that one unit change in healthy lifestyle index (exercise, diet and quitting smoking) was associated with a 33% lower risk of shifting to MUO.

It appears that MHO individuals cross-sectionally and over brief periods of time may be at less risk of metabolic dysfunction, including diabetes, cardiovascular disease, and obesity-related cancers compared to metabolically unhealthy normal weight (MUH-NW), but these effects are transient. In long-term studies, despite “healthy” metabolic profiles, these individuals may still be at increased risk for cardiovascular morbidity and mortality

To determine which factors can influence the transition from an MHO to metabolically unhealthy obesity, in Spain a cohort of 3,052 individuals, aged 25 to 74 years were screened (Schroder H. et al, 2013) were followed up for 10 years (year 2000 to 2009). At baseline, 20.8% were MHO and overweight, but at the end of the study, 49.2% of these individuals were already classified as MUO and overweight. Risk factors identified at baseline were: increase in abdominal adiposity as

Eckel, N., et al. 2015 European Journal of Preventive Cardiology 0(0): 1-11