

## Effect of diet and lifestyle on the relationship between body mass index and waist circumference and cardiovascular mortality in myocardial infarction patients from the Alpha Omega Cohort

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**Introduction:** The associations between measures of body adiposity (body mass index (BMI) and waist circumference (WC)) and cardiovascular disease (CVD) mortality have been frequently studied and usually follow a J-shaped curve or show a positive relationship. However, less is known about the influence of diet and physical activity on these associations.

**Purpose:** We aimed to gain insight in potential lifestyle-related effect modifiers of the association of BMI and WC with CVD mortality in myocardial infarction (MI) patients.

**Methods:** We included 4,837 Dutch patients from the Alpha Omega Cohort with a MI <10 y prior enrolment. BMI and WC were assessed at baseline (2002–2006). Patients were followed through December 2018 for vital status and cause-specific mortality. Continuous associations of BMI and WC with CVD mortality were estimated using Cox proportional hazards models with restricted cubic splines. A BMI of 25 kg/m<sup>2</sup> and a WC of 100 cm were used as the references. Age and sex adjusted associations were stratified for diet quality and physical activity level and interaction terms were calculated.

**Results:** Of the study population (69.0±5.6 y), 17% smoked, 21% had diabetes, 22% were female and >85% used any type of cardiovascular medication. During a median follow-up of 12.4 years [8.5–13.8], 1,010 deaths occurred due to CVD. A J-shaped continuous association was observed between BMI and CVD mortality with inverse associations for a BMI between 25–30 kg/m<sup>2</sup>, compared to 25 kg/m<sup>2</sup>. The nadir (HR, 95% CI) was 27.4 kg/m<sup>2</sup> (HR: 0.94, 95% CI: 0.88, 1.00) (A). For WC, a non-linear association was observed with CVD mortality with higher mortality risks for a WC above 100 cm (A). Results were similar in patients with low versus high diet quality and in patients with low versus high physical activity (B), interaction terms were not significant (all p > 0.55).

**Conclusion:** In MI patients, a BMI between 25–30 kg/m<sup>2</sup> was associated with the lowest risk of CVD mortality. A WC above 100 cm was associated with a higher CVD mortality risk. The observed associations manifested independently of diet quality and physical activity level. Therefore, body adiposity seems to determine CVD mortality risk independently of underlying lifestyle factors.

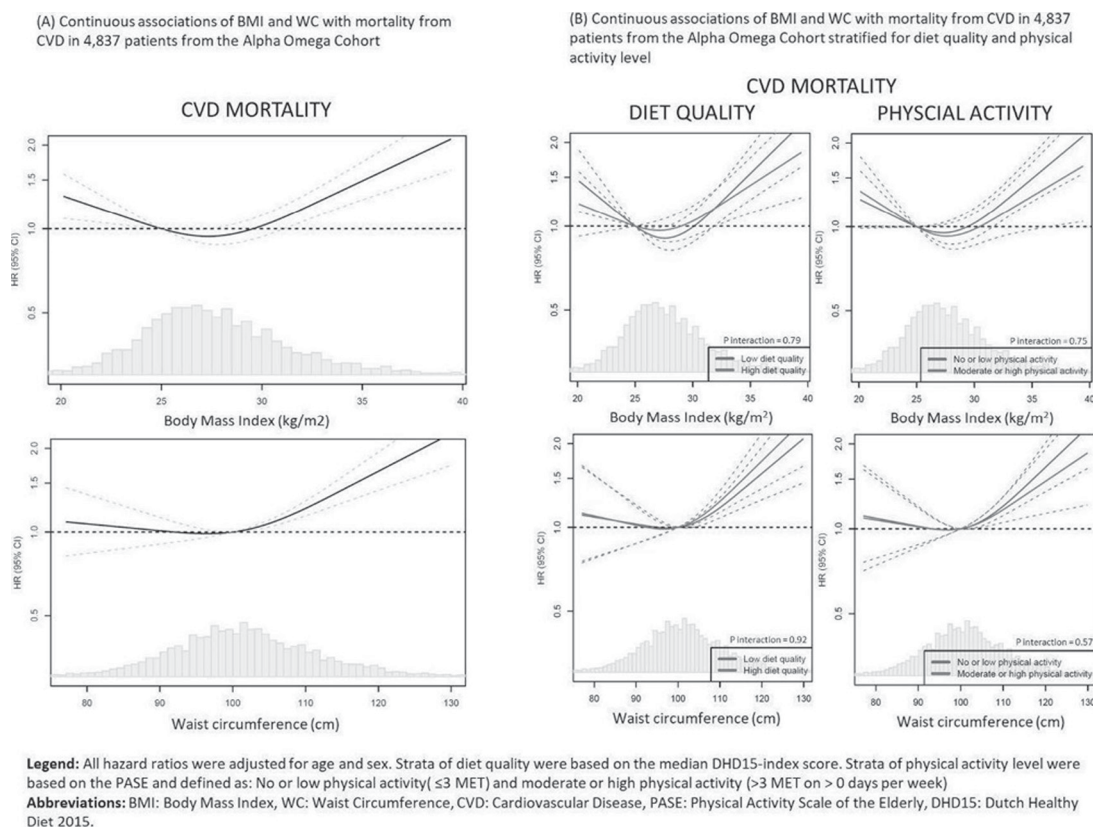


Figure 1