

THE EXPLANATION OF EDUCATIONAL DISPARITIES IN ADIPOSITY BY LIFESTYLE, SOCIOECONOMIC AND MENTAL HEALTH MEDIATORS

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BACKGROUND

- The negative association between education and obesity was previously found in numerous studies.
- However, education level per se is not directly related to the risk of obesity. For this reason, it is necessary to focus on factors linked to educational disadvantage, which serve as mediators that drive the association.
- Lower educational levels are associated with poor lifestyle, socioeconomic disadvantage, and mental health problems, which all are simultaneously risk factors of increased adiposity.
- We hypothesize the potential mediating role of lifestyle, socioeconomic and mental health factors in the association between education and increased adiposity.

AIM

To assess diverse mediators in the educational disparities in adiposity, considering the sex differences.

POPULATION

The data source is the Kardiovizie study, which is an ongoing population-based study performed in the International Clinical Research Centre (ICRC) in St Anne's University Hospital in Brno. The Kardiovizie study started in 2014, evaluating health with an emphasis on the cardiovascular health of the adult population in Brno. In total, 2160 subjects aged 25-65 years participated in the first evaluation, and the ongoing second evaluation (re-examination) completed in 2021.

MEASURES

- Educational attainment** was classified into three groups: "high", including subjects with higher professional or university education; "middle", defined as high school education; and "low", defined as elementary or vocational education without a final graduation exam.
- Adiposity** was assessed as a latent variable constructed based on four main available adiposity biomarkers - body fat percentage, body mass index, waist circumference, and visceral fat.
- The assessed mediators were: **dietary risk, alcohol intake, smoking, sedentary behaviours, income, stress, depression, and quality of life** was assessed in age-adjusted sex-specific simple and multiple mediation models.

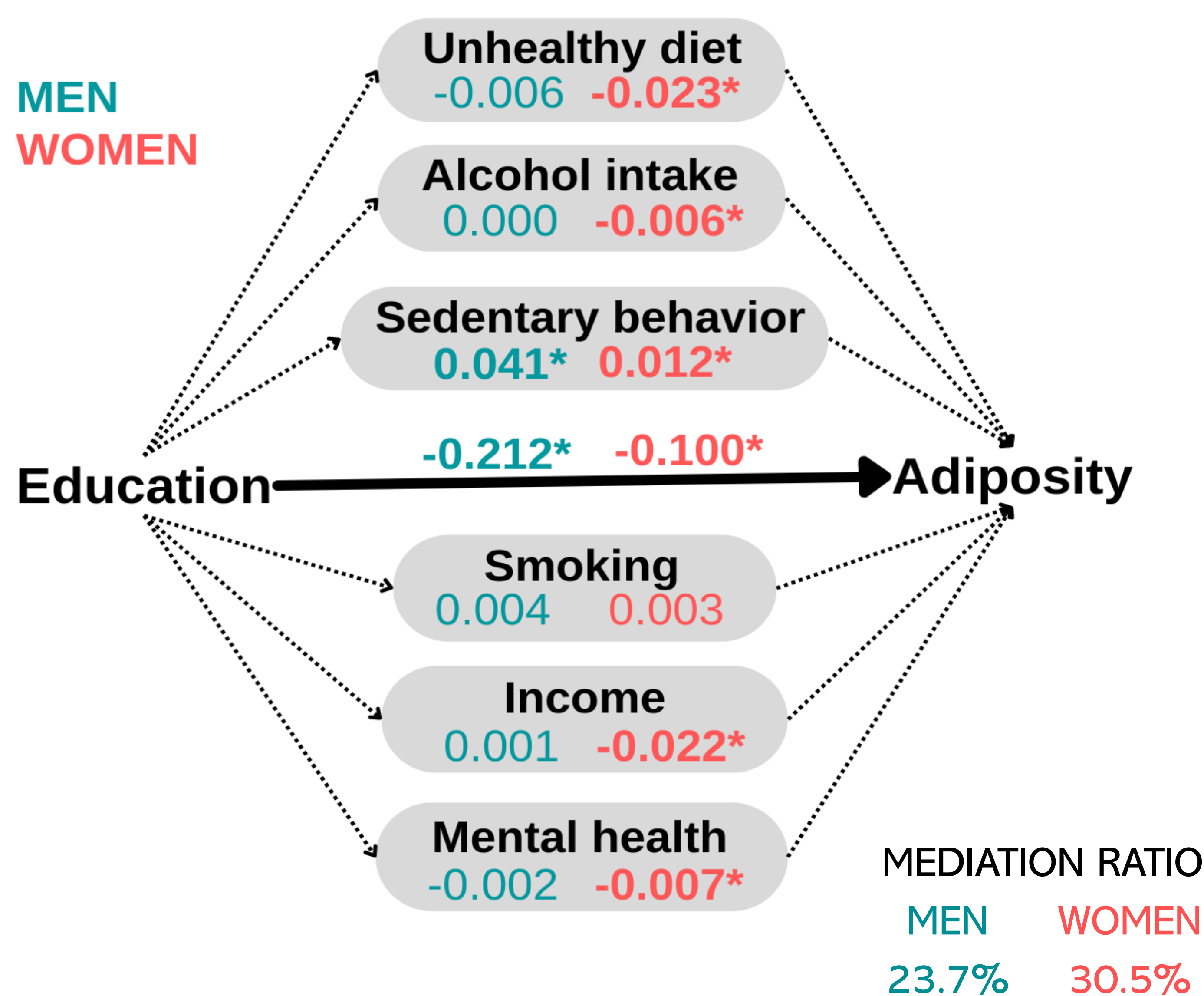


Figure 1: Standardized direct and indirect effects of multiple mediation analysis by sex. *p<0.05

DATA ANALYSIS

All analyses were performed separately for both sexes to capture sex-specific relationships between variables. Bivariate correlations between mediators were estimated to assess potential collinearity. As the mental health mediators were strongly intercorrelated, the latent variable of mental health was constructed. Then, a simple mediation analysis was performed, where each potential mediator was tested separately in a model with education as a predictor and adiposity as the outcome. Total, direct, and indirect effects were calculated. Next, a **multiple mediation model** including all potential mediators in one set was developed. When computing the estimates and significance of the indirect effects, a bootstrapping procedure with 5,000 resamples was performed.

RESULTS

- The negative direct effect of education on adiposity was significant in all investigated models.
- In a simple mediation model, where each potential mediator was tested separately, in men, the indirect effect significantly operated via sedentary behavior, while in women via dietary risk, alcohol consumption, sedentary behavior, income, and mental health.
- In multiple mediation models including all potential mediators in a one set, in men, the indirect effect was significant via sedentary behavior ($\beta=0.041$; 95% CI [0.025 to 0.062]) with a mediation ratio of 23.7%. In women, the indirect effect was significant via dietary risk ($\beta=-0.023$, 95% CI [-0.037 to -0.013]), alcohol intake ($\beta=-0.006$; 95% CI [-0.014 to -0.001]), sedentary behavior ($\beta=0.012$, 95% CI [0.004 to 0.023]), income ($\beta=-0.022$; 95% CI [-0.041 to -0.004]), and mental health ($\beta=-0.007$; 95% CI [-0.019 to -0.001]).
- The total mediation ratio in women was 30.5%.

CONCLUSION

- In women, the increased adiposity in those with lower educational levels is driven mostly by unhealthy dietary behaviours and lower income.
- In men, no mediators contributing to the inverse gradient between education and adiposity were found.
- Our study identified sedentary behaviors as an important risk factor reducing the protective potential of higher educational levels in both sexes, with a higher magnitude in men.
- This finding suggests that reducing sedentary time should be sufficiently targeted in public health strategies to reduce the burden of increased adiposity in the population.