Do economic preferences predict obesity severity? Evidence from a randomised controlled trial with medically at-risk patients

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Abstract

OBJECTIVES: Can excessive weight gain be attributed to the way individuals make economic decisions? We study the role of risk tolerance and impatience in predicting the severity of obesity in a clinically relevant population.

BACKGORUND: If current trends continue, obesity will affect 20% of the global population within 10 years. For Australia alone, this figure increases to 35% of all adults. Obesity represents high health and economic costs for affected individuals. It is related to higher risk of cardiovascular disease, type 2 diabetes, osteoarthritis and several cancers, as well as lower wages and worse employment prospects. However obesity also imposes an unsustainable economic burden on society, due to the lower productivity generated by worse health, but also to resource diversion within the health care system towards affected individuals and compensation across public policy domains. Understanding the determinants of obesity is of crucial importance to inform future health policy that can effectively reverse these patterns.

METHODOLOGY: We use data from an economic choice experiment conducted on 300 heavy and pre-diabetic adults who participated in a hospital-run 12-month weight-loss and -management randomised controlled trial in Sydney, Australia. Risk and time preference measures are collected through financially incentivised economic choice scenarios, the obesity severity measures are derived from high-precision clinical examinations (BMI, body fat, waist circumference), and important background variables on age, socioeconomic status, and personality are collected through a survey. To construct proxies of risk tolerance and impatience, we use both simple counts of risky and sooner choices, respectively, and jointly estimated

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preference parameters based on a functional form for preferences, that allows us to adjust for the concavity of the utility function.

RESULTS: Controlling for relevant background variables, we find that risk tolerance is negatively associated with the severity of obesity when measured with BMI (p-value$<$0.05) and waist circumference (p-value$<$0.01) for females, and weakly positively for males (significant only for waist circumference, p-value$<$0.10). Moreover, no significant relationship emerges between adiposity, the most precise and clinically relevant measure of obesity, and risk tolerance. Furthermore, there is neither evidence of an association between impatience and the severity of obesity, nor evidence for present bias. Finally, the estimation results are robust to restricting the analysis to participants with consistent preferences. Participants with consistent preferences tend to be not only younger and better educated but also more risk averse and patient. Important sex differences emerge in the relationship between preference inconsistency and obesity severity, where females with inconsistent preferences tend to be heavier, while males tend to be lighter.

DISCUSSION: Our findings deviate strongly from previous literature, which finds that more risk tolerant and impatient individuals tend to have higher BMI. There are at least two reasons why our results may differ. First, we have high-quality and precision measures of economic preferences and excessive weight. Previous studies are predominantly relying on self-assessed health outcomes and preference measures, or are based on non-incentivised economic choice experiments, allowing for the possibility of correlations due to unobserved and systematic measurement errors. Second, the relationship between risk tolerance or impatience and weight could be concave or even hump-shaped, with turning points at the thresholds to unhealthy weight. In this case, we cannot observe a positive relationship as in previous studies, because in our clinical sample of medically at-risk and heavy patients, the minimum BMI is greater than 25 (overweight), and the average BMI of 34 indicates obesity, significantly above the Australian national average (27.5). We discuss the implications of our findings for public policy and the design of medical interventions.