

Abstract

Effect of Mediterranean Diet Adherence and Its Interaction with Genetic Susceptibility to Obesity on Adiposity in European Children: The IDEFICS/I.Family Study [†]

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Abstract: Introduction: The Mediterranean Diet (MD) has been associated with a better adiposity profile in different cohorts of European children. However, these beneficial effects might be influenced by genetic variations, which could potentially modulate the MD–adiposity association. Objectives: To investigate if higher adherence to the MD, or any of the MD food groups, is associated with lower adiposity during youth. Also, to observe the degree by which the adherence to the MD or any of the MD food groups could modulate the genetic susceptibility to obesity, in relation to adiposity. Methods: Design: Cohort study with three measurement surveys: baseline (T0), follow-up 1 (T1), and follow-up 2 (T3), between 2007 and 2014. Setting: The pan-European IDEFICS/I.Family cohort. Participants: 3098 children aged 2–16 years were genotyped. A total of 1907 participants at time measurement 3 (T3) were included, with complete information in all parameters of interest. Outcome measures: body mass index (BMI) and waist circumference (WC). A 7-item Mediterranean Diet Score (MDS) to assess the degree of MD adherence, and a genome-wide polygenic risk score (PRS) for BMI previously built within the IDEFICS/I.Family consortium, from a previous GWAS to capture obesity risk. Statistical analysis: In T3, multiple linear regressions to test MD–adiposity and MD–food–groups–adiposity associations, adjusted by age, sex, parental education, genetic susceptibility to obesity, population stratification, region of residence, screen sedentary time (SST), and physical activity. Then, the same models were used to estimate gene x diet effects, based on the PRS x MD adherence. Results: No associations were found between MDS and BMI or WC adiposity markers (p -value 0.26, B 0.10). In terms of food groups, higher vegetable consumption was inversely associated to BMI (p -value < 0.01, B –0.01) and WC (p -value 0.01, B –0.02), although no gene x vegetables interaction effects were found (BMI p -value 0.43, B < 0.01; WC p -value 0.49, B 0.01). Age and SST were also significantly associated to BMI (p -value 0.01, B –0.12; p -value < 0.01, B 0.02), and only SST to WC (p -value 0.03, B 0.05), respectively. Conclusions: Higher consumption of vegetables might be associated with lower obesity, irrespective of their obesity genetic risk.

Keywords: Gene x diet; polygenic risk score; Mediterranean diet; BMI; children



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Informed Consent Statement: Informed consent was obtained from all parents or guardians and verbal agreement of the children involved in the study.

Data Availability Statement: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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