








## Abstract

# Association between the Planetary Health Diet Index and Cardiovascular Health Status among European Adolescents: The HELENA Study <sup>†</sup>

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<sup>†</sup> Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

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**Abstract:** Background: The EAT-Lancet Commission proposed a global reference diet to promote healthy diets within planetary boundaries. Recently, the Planetary Health Diet Index (PHDI) was proposed to evaluate the adherence to the EAT-Lancet diet, and it has been validated among European adolescents. However, studies evaluating the associations between the PHDI with health outcomes among adolescents are lacking. Thus, our aim was to assess the association between adherence to the EAT-Lancet diet—through the PHDI score—and cardiovascular health among European adolescents. Methods: Data from the Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) study were used. Usual dietary intake was assessed using two 24 h dietary recalls, and adherence to the EAT-Lancet diet was assessed using the PHDI, a 16-component index that ranges from 0 to 150 points. Cardiovascular health was assessed through the seven-component Ideal Cardiovascular Health (ICH) score, the seven components of which are as follows: never smoked, eutrophic body mass index, moderate to vigorous physical activity, healthy dietary pattern, low blood pressure, low fasting plasma glucose, and low total cholesterol. Total ICH scores were categorized into ideal (5–7) and non-ideal (0–4). Logistic regression models were fitted to evaluate the association between the PHDI and ICH, and the model was adjusted for potential confounders, including age, sex, socioeconomic disadvantage/vulnerability score, and total energy intake. Results: A 10-point increase in the PHDI was associated with a lower probability of a non-ideal ICH status (OR 0.84, [95% CI: 0.75, 0.94]) among European adolescents in the adjusted model. Furthermore, a 10-point increase in the PHDI was associated with a lower probability of high blood pressure (OR: 0.87 [0.79, 0.96]) and a lower probability of high blood cholesterol (OR: 0.88 [0.78, 0.99]). Discussion: In the HELENA study, we found that higher adherence to the EAT-Lancet reference diet was positively associated with better cardiovascular health among European adolescents. Furthermore, adolescents with a higher PHDI were less likely to have high blood pressure and cholesterol.

**Keywords:** EAT-Lancet diet; sustainable diets; cardiovascular health; adolescents' health



**Citation:** Cacau, L.T.; Huybrechts, I.; Hanley-Cook, G.T.; De Ruyter, T.; Marchioni, D.M.; De Henauw, S.; Moreno, L.A. Association between the Planetary Health Diet Index and Cardiovascular Health Status among European Adolescents: The HELENA Study. *Proceedings* **2023**, *91*, 60. <https://doi.org/10.3390/proceedings2023091060>

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 20 November 2023



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**Author Contributions:** Conceptualization, L.T.C., D.M.M., and L.A.M.; formal analysis, L.T.C.; investigation, L.T.C.; data curation, L.T.C. and I.H.; writing—original abstract, L.T.C.; writing—review and editing, L.T.C., I.H., G.T.H.-C., T.D.R., D.M.M., S.D.H. and L.A.M.; supervision, S.D.H. and L.A.M. All authors have read and agreed to the published version of the abstract.

**Funding:** The HELENA study received funding from the European Union's Sixth RTD Framework Program (contracts FOODCT-2007-036196-2 and FOODCT-2005-007034, respectively). Additional support was obtained from the Spanish Ministry of Education (AGL2007-29784-E/ALI). L.T.C. received a research internship abroad scholarship (grant number 2020/12326-1) from the Sao Paulo Research Foundation (FAPESP).

**Institutional Review Board Statement:** The HELENA study was approved by the Research Ethics Committees of each study site and followed the ethical guidelines of the Declaration of Helsinki 1964 (revision of 2000), good clinical practice, and the legislation about clinical research in humans in each one of the countries involved in the study in February 2006.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data described in the manuscript can be made available upon request pending application and approval by the chair of the steering committee for the HELENA study. The analytic code of the PHDI computation will be made available upon request pending to the corresponding author.

**Conflicts of Interest:** The authors declare no conflict of interest with this work.

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