The capital importance of lifestyle and diet in cardiovascular disease

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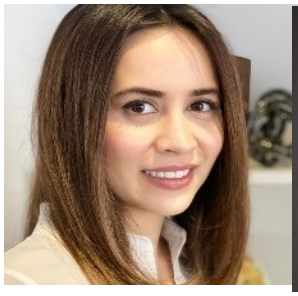


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This issue of the *European Journal of Preventative Cardiology* focuses on Lifestyle and Cardiovascular Diseases.

In 2022, the American Heart Association (AHA) revised its widely used *Life's Simple 7* framework, incorporating new insights—such as the critical role of sleep on cardiovascular health—and refining components including diet, nicotine exposure, blood lipids, and blood glucose to create the *Life's Essential 8 (LE8)*. While LE8 offers an updated approach to promoting cardiovascular health, its ability to predict key clinical outcomes has lacked comprehensive evaluation. In **Life's Essential 8 and the risk of cardiovascular disease: a systematic review and meta-analysis,** *Sebastian et al*.[1] address this gap with a systematic review and meta-analysis of observational studies to examine the associations of LE8 with CVD outcomes and mortality. Their review identified 34 studies involving 1.8 million participants aged 18-80, followed for an average of 12 years. The findings are compelling: higher LE8 scores (80-100 out of 100 points) were associated with a 53% reduction in cardiovascular disease (CVD) risk, including a 56% reduction in coronary heart disease and a 48% reduction in stroke. All-cause mortality was also significantly reduced by 46%. Bloomfield[2], in an accompanying editorial, highlights opportunities for improvement, noting that standardising the assessment of key components, such as diet and physical activity, could enhance the comparability of LE8 across studies. While these improvements could further strengthen the evidence base, the current findings, based on diverse populations from China, Finland, Spain, the UK and the USA suggest that LE8 is a useful and relevant framework for improving cardiovascular health worldwide.

The importance of lifestyle optimisation for cardiovascular health is further reinforced in **Differences in the association of lifestyle-related modifiable risk factors with incident cardiovascular disease between individuals with and without diabetes**. *Komuro et al*[3] offer a more detailed perspective on the role of lifestyle for cardiovascular health. Analysing claims data from 4 million Japanese employees enrolled between 2005 and 2022, the authors used information on health-checks, as well as inpatient and outpatient records. The authors compared the associations between modifiable risk factors and incident CVD in those with and without diabetes in stratified analyses.

The associations of metabolic risk factors (i.e., obesity, hypertension, and dyslipidaemia) were attenuated in individuals with diabetes compared to those without, whereas the associations for lifestyle-related factors were notably stronger in those with diabetes. For instance, a variable measuring non-ideal eating habits, defined as skipping breakfast three or more times a week, was associated with a 7% increased risk of CVD in individuals with diabetes compared with 3% in those without diabetes. Physical inactivity was associated with a 6% increased risk of CVD compared with 4% in those without diabetes. Smoking had the most pronounced difference, increasing CVD risk by 14% in those with diabetes, compared to 3% in those without. Both groups exhibited a dose-response relationship between the number of non-ideal lifestyle risk factors and CVD, but the associations were consistently stronger in individuals with diabetes. In an accompanying editorial, Sudevan and Allison[4] suggest that future research investigate these relationships further to better inform the development of interventions aimed at reducing CVD risk in patients with diabetes. Such efforts could complement advancements in CV treatments and diagnostics, while emphasising lifestyle modification as a key pillar of CVD prevention and management, especially for high-risk populations like those with diabetes.

Diet takes centre stage in the next three papers in this issue, with each examining healthy eating patterns and offering slightly different takes on a healthy diet and its impact on cardiovascular health.

In **Magnesium-rich diet score is inversely associated with incident cardiovascular disease: the Atherosclerosis Risk in Communities (ARIC) study,** *Copp et al.*[5] examined the role of dietary magnesium and cardiovascular health. Using data from 15,022 adults aged 45-64 years, dietary intakes were assessed at two visits six years apart, and the associations of dietary magnesium with cardiovascular outcomes were evaluated over a 30-year follow-up period. The authors developed a magnesium-rich diet score based of magnesium-rich foods, including whole grains, nuts, vegetables, fruits, legumes, coffee, and tea. Participants in the highest quintile of the magnesium-rich diet score had a 13% lower risk of CVD, and an 18% lower risk of coronary heart disease compared with those in the lowest quintile. No significant association was observed between the magnesium-rich diet score

and ischemic stroke. Despite these encouraging findings, the authors highlight a stark reality: up to 75% of Americans fall short of recommended magnesium intake levels, signalling a missed opportunity for improving cardiovascular health.

The dual imperatives of promoting cardiovascular health and environmental sustainability converge in **Association between planetary health diet and cardiovascular disease: a prospective study from the UK Biobank**. In their analysis of 118,469 adults aged 40-69 years from the UK Biobank study, *Sotos-Prieto et al*[6] examined the associations between adherence to the Planetary Health Diet Index (PHDI) and cardiovascular diseases. The PHDI, broadly based on the EAT-Lancet report, prioritises whole grains, fruits, fish, and reduced consumption of added sugars. Using two 24-h dietary assessments, the authors calculated adherence to a PHDI and participants were followed for 9 years for incident CVD. Compared to those in the lowest quartile, participants in the highest quartile of the PHDI had a significant 14% reduction in CVD, 12% reduction in myocardial infarction, and 18% reduction in stroke. The associations revealed a dose-response pattern and remained consistent across multiple sensitivity analyses. This study highlights the potential of the PHDI to reduce the burden of CVD while addressing the environmental impact of global food systems, which as highlighted by the authors, contribute approximately 30% of greenhouse gas emissions. In an accompanying editorial, Hickling[7] advocates for initiatives, such as incentives for healthy food choices or disincentives for environmentally harmful products, to promote the adoption of sustainable diets such as the PHDI, offering a pathway towards better cardiovascular and planetary health.

In the third paper on healthy diets, *Heianza et al.*[8] examined the relationship between plasma levels of erythritol, mannitol, and sorbitol—commonly consumed sugar alcohols—and the risk of coronary heart disease (CHD) in their study titled **Plasma levels of polyols erythritol, mannitol, and sorbitol and incident coronary heart disease among women.** Using a prospective nested case-control design within the Nurses' Health Study, they analysed data from 762 women with CHD and 762 matched controls, with follow-up ranging from 11 to 16 years. Higher plasma levels of erythritol and mannitol/sorbitol were associated with increased CHD risk, even after adjusting for traditional risk factors such as diet, lifestyle factors, adiposity, hypertension and dyslipidaemia (see Figure 1).

For erythritol, the association was attenuated after adjusting for diabetes, which the authors suggest may indicate a potential metabolic interaction. In contrast, the relationship between mannitol/sorbitol and CHD remained significant, which the authors propose may be due to differences in the pathways influenced by these polyols. In an accompanying editorial, Lutz and Osto[9] point to the complexities in differentiating endogenous production from dietary intake. These contrasting findings suggest a need for further research to clarify causal mechanisms to determine whether these molecules serve as markers of metabolic dysregulation or directly contribute to disease processes.

However, adopting healthier lifestyle habits can present challenges, as highlighted in a rapid communication by *van Oortmerssen et al.*[10]. The authors conducted a mixed-methods study to examine barriers, needs, and preferences for lifestyle guidance in women with a history of severe pre-eclampsia, integrating perspectives from both patients and healthcare providers. Pre-eclampsia doubles CVD risk and despite awareness, only 38% of women received lifestyle guidance. Both patients and healthcare providers emphasised the need for personalised, multidisciplinary cardiovascular risk management, with women favouring hospital-based care for its comprehensive approach.

Together, the articles, editorials, and rapid communication in this issue highlight the pressing need for innovative, targeted strategies to tackle the intertwined challenges of cardiovascular health, environmental sustainability, and the care of high-risk populations.

The editors hope that this issue of *European Journal of Preventive Cardiology* will provoke fresh thinking and inspire renewed efforts to leverage lifestyle as a cornerstone of cardiovascular health and prevention.

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LEGENDS FOR FIGURES

Figure

Central illustration of the article ‘Plasma levels of polyols erythritol, mannitol, and sorbitol and incident coronary heart disease among women’ from Heianza et al.[5]

Figures

Figure 1