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EDITORIAL

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Dietary and lifestyle intervention strategies to tackle unhealthy behaviours in the Mediterranean countries

Given the alarming spread of chronic non-communicable diseases (NCDs), the need for lifestyle changes is paramount. Evidence suggests that lifestyle-related risk factors play an important role in the global burden of disease (GBD 2021 Risk Factors Collaborators 2024). Among behavioural risks on global health, the Institute for Health Metrics and Evaluation (IHME) pointed out that malnutrition and unhealthy diets were ranked first and third respectively, in 2021 (IHME 2024). These unhealthy dietary habits resulted in 7,94 million deaths annually in people over 25 years of age (Lancet 2020). Specifically, high sodium intake, low consumption of plant-based products, high meat consumption, and high intake of trans fatty acids are the most impactful factors (IHME 2024). The scientific community, also supported by the media and information campaigns, constantly warns people about this matter. Nevertheless, "*as a world, we are failing to change some behaviours, particularly those related to diet quality, caloric intake, and physical activity*" said the conclusions of the Lancet Commission in 2020 (GBD 2019 Risk Factors Collaborators 2020). To date, among the health challenges, establishing healthy eating habits is thereby mandatory. This is imperative to address already persistent clinical conditions in the population, primarily obesity and overweight. Data shared by the World Health Organisation (WHO) is indeed alarming, showing that 1 in 8 people worldwide had obesity in 2022 (WHO 2024). There is a clear need for timely effective actions (Sotos-Prieto et al. 2022). Besides directly treating this health condition, changing lifestyle habits is equally important to prevent it. Within this overall context, younger people and their families are the primary target group. Promoting changes persistently over time is indeed more effective in the youth generation (UNICEF 2020). Educational interventions would also tackle unhealthy eating habits and lifestyles that are spreading among adolescents with implications for their physical and mental well-being (D'Innocenzo et al. 2019).

Public health initiatives and European projects are intervention strategies currently being promoted to achieve change at both local and community levels. Given the global nature of the problem, cooperation and coordinated efforts among countries are crucial to identify innovative approaches. Likewise, it is necessary to apply a multidisciplinary approach involving different societal actors and professionals. Adherence to healthy and sustainable eating patterns is in fact shaped by economic, social and environmental factors (Godos 2023). Therefore, improving eating habits requires holistic strategies that go beyond providing theoretical knowledge about a healthy diet.

In this context, the abandonment of healthy traditional dietary patterns in certain regions results as a substantial health risk for the general population. The Mediterranean area is a well-known example, showing nowadays a worsening trend of dietary habits and a decline in adherence to the traditional dietary habits (Damigou et al. 2023). In the Euro-Mediterranean region, PRIMA European programme is investigating and implementing different intervention approaches (PRIMA 2024a). The programme focuses on three main research areas: Water Management, Farming Systems and Agro-food Value Chain. The last one aims to foster adherence to healthy and sustainable diets and to promote social and economic well-being among the population of the Mediterranean countries (PRIMA 2024b). Therefore, the Mediterranean diet, whose effects on health and the environment have been widely reported (Godos et al. 2024; Tolomeo et al. 2023), is a pivotal element in the research and innovation projects funded within the PRIMA programme. Furthermore, Information Technology (IT) tools, educational strategies, as well as healthy and sustainable food products with pioneering production technique features are among the innovative methodologies promoted and tested by these projects on several target populations. The final purpose of PRIMA funded projects is indeed applying these intervention strategies on a larger scale. To this end, the PRIMA programme encourages collaboration between

universities, companies and other research institutions from different Mediterranean countries.

In this issue of the International Journal of Food Sciences and Nutrition, the protocol for the DELICIOUS project (*UnDErstanding consumer food choices & promotion of healthy and sustainable Mediterranean diets and LIfestyles in Children through behavIOUral change actionS*) has been published (Grosso et al. 2024; DELICIOUS Project 2024). The project aims to improve adherence to the Mediterranean diet through school interventions, alongside physical activity programmes, and digital tools for school canteens and parents.

Other PRIMA projects aimed at increasing knowledge and promoting healthy and sustainable eating habits among Mediterranean young populations, thus promoting prevention actions. In this framework, PROMEDLIFE, and SWITCHtoHEALTHY projects were funded by PRIMA in 2021 within the topic '*Increase adherence to the Mediterranean diet as a sustainable pattern including environmental, social and health aspects*'. These projects aimed at increasing adherence to the Mediterranean diet and promoting a healthy lifestyle targeting young people at home and school settings. All these projects combine several intervention strategies: mobile or web applications and technological platforms, healthy and sustainable snacks, educational programmes with dietary plans, proposals, activities and games. More specifically, in the PROMEDLIFE project (*Novel food products for PROmotion of MEDiterranean LIFEstyle and healthy diet*) adherence to the Mediterranean diet is promoted through nutritional and sensory educational lessons in schools, as well as through the design and distribution of new healthy and Mediterranean snacks (PROMEDLIFE Project 2024). Finally, in the SWITCHtoHEALTHY project (*Switching Mediterranean consumers to Mediterranean sustainable healthy dietary patterns*), a technological application is created to provide weekly food plans and support families in managing their daily diet, delivering also educational materials for families and schools, and promoting the consumption of new healthy food products (SWITCHtoHEALTHY Project 2024).

Although it may be more challenging to modify incorrect lifestyles in adults, educational projects targeting adults were also financed in 2022, within the PRIMA topic '*Enabling the transition to healthy and sustainable dietary behaviour*'. The Tool4MEDLife project (*New Foods and Educational Toolkits for a Healthy and Sustainable Mediterranean Lifestyle*) wants to explore dietary and lifestyle habits of Mediterranean populations to develop new healthy food products based on Mediterranean tradition and educational strategies to promote adherence to the MD and healthy lifestyle. The B4HT project (*Box for Health by Tradition & Innovation: promoting sustainable mediterranean diet by Healthy Foods*) provides healthy food in an easy-to-use format as a lunch box delivered by an educational smart app to a cohort of both metabolically healthy and non-metabolically healthy subjects. Similarly, the MEDIET4ALL project (*A Transnational movement to support the sustainable transition towards a healthy and Eco-friendly Agri-Food System through the promotion of MEDIET and its lifestyle in modern society*) aims at promoting Mediterranean Lifestyle adherence, combining the Mediterranean diet with '*Quick & Easy*' recipes and educational contents within a program having physical, psychosocial and cultural activities available through a platform and a smart app (MEDIET4ALL Project 2024). Several Mediterranean recipes are developed and provided within a digital farm-to-fork traceability platform also in the MoreMedDiet project (*More on the adoption of a healthy Mediterranean diet*) with the purpose of encouraging the consumption of local traditional foods in different Mediterranean populations. Differently, the MedDietMenus4Campus project (*Promoting stakeholder adherence to Mediterranean Diet on Campus through menu interventions and social marketing strategies*) addresses food service in public high-education institutes canteens to foster healthy eating habits when eating out. In this context, Mediterranean menus and marketing strategies are explored targeting both key stakeholders and consumers. Finally, among projects funded by PRIMA within the thematic area related to the Agro-food Value Chain, just one had the main objective of targeting the Mediterranean population with obesity. The MED4Youth project (*Mediterranean Enriched Diet for tackling Youth Obesity*), started in 2018 and recently ended, aimed at tackling overweight and obesity in young people, fostering the Mediterranean diet adherence (Boqué et al. 2021; MED4Youth project 2024). A clinical nutritional intervention has been applied on adolescents living in Italy, Portugal, and Spain with excessive weight status, combining Mediterranean-based dietary plans including typical Mediterranean foods, nutrition education and web app.

Alongside more direct approaches as described so far, the PRIMA programme is also notable for projects focused on the food production chain and its actors. In promoting good eating habits and high-quality food products, indeed it is important to channel efforts from farm to fork. Thus, adherence to the Mediterranean diet is promoted indirectly through the

design and production of innovative healthier products and the promotion of traditional Mediterranean foods, benefiting both final consumers and local producers. Community-level efforts aimed at promoting healthy lifestyles in the population are remarkable. These intervention strategies could become successful solutions on a large scale. Nonetheless, bilateral collaboration is indispensable, and Mediterranean citizens themselves must be frontline actors in this challenge.

Sharing the methodologies and results of these projects within the public and private stakeholders can catalyse the dissemination of knowledge and foster collaboration, ultimately amplifying the impact of intervention strategies worldwide. The results will highlight best practices to be shared by public and private institutions, and they can guide food policies to be implemented at the local level from a global perspective. In fact, the availability of healthy and sustainable diets, from a social, economic, cultural and environmental perspective, for the entire population must be of paramount importance to governments.

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