Preface by Guest Editors

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The health of the individual and the population in general is based on the interaction between genetic and environmental factors. Nutrition and physical activity are two environmental factors of major importance that operate throughout the life cycle and influence human development. Adolescence is a critical period for growth and sexual, physical and emotional maturation and development, which creates a great deal of our physical trajectory into and through adulthood. HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence) is a multicenter study of European adolescents located in urban settings from 11 cities in 10 different countries. These countries differ in geography, climate, religion and the physical and cultural environment with important differentials in dietary and physical activity and inactivity patterns. To carry out this collaborative study dedication on the part of both scientists and participants was required. As external advisors, we attended the working meetings, and were very impressed with the enthusiasm, hard work and persistence to complete the study on the part of Dr Luis Moreno, the coordinator of the study, and the individual investigators. The scientific meetings of the HELENA project consisted of extended discussions of the data generated by the different investigators, and the development of manuals following the training workshops and pilot studies.

The study has developed systems for data management, quality assurance monitoring and standardized manuals of operating procedures. HELENA illustrates a spirit of collaboration between scientists and study participants and has led to the development of methods that are highly appropriate for studying this complex period of growth and development. They are focused on controlling for many of the biases and errors that often exist in comparative studies. This requires careful attention to standardization of training and data collection as well as precise standardization and controls in the handling and processing of all biological specimens.

Today all studies must conform to ethical and regulatory aspects of good clinical practices. Thus medical and regulatory requirements must be satisfied including independent ethics committee approval, and agreement by national or local regulatory authorities. The investigators followed the good clinical practices (GCP) described at the International Conferences on Harmonization (ICH), which was adapted to the national and local situations of each of the 11 participating cities in 10 European countries.

The main objective of the HELENA Cross-Sectional Study (CSS) was to evaluate reliable and comparable data of nutritional habits and lifestyle in a representative sample of European adolescents. The methods relating to ethical and regulatory issues describing the current state of the medico-regulatory requirements involved in conducting this kind of study in each country were precisely defined. The study showed that high-quality non-therapeutic biomedical research can address the ethical issues included in the ICH–GCP regulations and can be harmonized among the HELENA European partners.

Another objective of HELENA-CSS was to examine the reliability of a set of health-related physical fitness tests. Flexibility, muscular fitness, speed/agility and aerobic capacity were tested using the back-saver sit and reach, handgrip, standing broad jump, Bosco jump, shuttle run and 20 m shuttle run tests. The data provided are relevant for a more accurate interpretation of physical fitness assessment in young people.

Socioeconomic questionnaires and clinical assessments required the development of a methodology. An extensive literature review and evaluation led to development of a case report form and to a precise, accurate and easy-to-complete questionnaire that contributes to better understanding of inequalities in nutrition, behavior and health in the European adolescent population, which could be useful for other multicenter studies.

Another objective of HELENA-CSS was to develop European standards for total body fat percentage and anthropometric indices of body fat distribution and to develop new regression equations for the determination of body fat composition by skin folds and bioelectrical impedance analyses (BIA). Considering the participation of 11 centers in 10 countries, it was essential to standardize, harmonize and accurately determine the various anthropometric and BIA measurements. This required the organization of workshops before the final surveys, which led to significant improvements in intra-observer reliability.

As blood specimens drawn in various countries had to be transported to a central laboratory for the determination of multiple nutritional biomarkers, it was necessary to develop appropriate methods that guaranteed centralized analyses and quality assurance of the most relevant blood parameters from fresh blood samples in adolescents. Therefore, training workshops and a manual of operations were developed and a pilot study was carried out. The methodology was evaluated and is considered adequate for the final part of the HELENA study. Thus, HELENA will provide, for the first time, reference values for several biological markers in European adolescents.

Each of the papers presented in this volume, was reviewed by two reviewers. Comments were sent to the authors and their responses were reviewed again. Having been present at the meetings, it made it easier to review the papers for both content and accuracy based on the discussions that had taken place at the meetings.

The papers in this volume show a spirit of collaboration, coordination and achievement in the development of new methods for the evaluation of adolescent health. It is expected that the instruments and methods developed in HELENA will be useful not only to European scientists, but throughout the world. The process that led to the development of methods is exemplary and consistent with the spirit that so often characterizes true scientific accomplishments.

The physical and behavioral changes in adolescence need to be better illustrated to highlight the challenges and the opportunities for actions to prevent chronic diseases. The

detailed assessments performed by the HELENA project will contribute to filling a gap in our knowledge of the nutritional status and lifestyle of European adolescents.

Conflict of interest

Barry M Popkin has received grant support from Nestle and Danone. The remaining authors state no conflict of interest.

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