



ELSEVIER

 JOURNAL OF
**ADOLESCENT
 HEALTH**

www.jahonline.org

Original article

Eating Habits and Total and Abdominal Fat in Spanish Adolescents: Influence of Physical Activity. The AVENA Study

Sonia Gómez-Martínez, Ph.D.^{a,*}, David Martínez-Gómez, Ph.D.^{a,b}, Fatima Perez de Heredia, Ph.D.^{a,c}, Javier Romeo, Ph.D.^a, Magdalena Cuenca-García^d, Miguel Martín-Matillas, Ph.D.^e, Manuel Castillo, Ph.D.^d, Juan-Pablo Rey-López, Ph.D.^{f,g}, German Vicente-Rodríguez, Ph.D.^{g,h}, Luis Moreno, Ph.D.^{f,g}, and Ascensión Marcos, Ph.D.^a

^a Immunonutrition Research Group, Department of Metabolism and Nutrition, Institute of Food Science and Technology and Nutrition (ICTAN), Spanish National Research Council (CSIC), Madrid, Spain

^b Department of Physical Education, Sport and Human Movement, Faculty of Education and Teaching Training, Autonomous University of Madrid, Madrid, Spain

^c Department of Medical Physiology, University of Murcia, Murcia, Spain

^d Department of Physical Education, University of Granada, Granada, Spain

^e Department of Physical Education and Sport, Faculty of Physical Activity and Sport Sciences, University of Granada, Granada, Spain

^f Department of Pediatrics, School of Health Sciences, University of Zaragoza, Zaragoza, Spain

^g GENUD, "Growth, Exercise, Nutrition and Development" Research Group, Universidad de Zaragoza, Zaragoza, Spain

^h Faculty of Health and Sport Science (FCSD), Department of Physiotherapy and Nursing, Universidad de Zaragoza, Ronda Misericordia 5, Huesca, Spain

Article history: Received May 25, 2011; Accepted August 30, 2011

Keywords: Dietary habits; Adolescents; Body fatness; Leisure-time physical activity

A B S T R A C T

Objective: To evaluate the association between specific dietary habits and body fatness in Spanish adolescents, and to analyze the role of leisure-time physical activity (LTPA) in this association.

Methods: In this cross-sectional study, 1,978 adolescents (1,017 girls) aged 13.0–18.5 years from the AVENA (*Alimentación y Valoración del Estado Nutricional en Adolescentes*) study were included. Particular dietary habits (breakfast, mid-morning snack, lunch, afternoon snack, dinner, and nighttime snack, as well as time spent eating, number of meals, consumption of soft drinks, and ready-to-eat foods) and LTPA were self-reported and analyzed as dichotomic variables (yes/no). The sum of six skinfold thicknesses and waist circumference (WC) values were the main body fatness variables.

Result: Skinfolts and WC values were lower in adolescents who reported consumption of mid-morning snack, afternoon snack, more than four meals per day, and an adequate speed of eating, independently of participation in LTPA. Moreover, a beneficial influence of breakfast consumption on skinfolts and WC values was observed in those adolescent boys who did not participate in LTPA (p for interactions = .044 and .040, respectively).

Conclusions: In Spanish adolescents, certain healthy dietary habits (i.e., mid-morning snack, afternoon snack, > 4 meals per day, adequate eating speed) are associated with lower body fatness, independently of engaging in LTPA. In addition, among boys with non-LTPA, those who skipped breakfast showed the highest body fatness values, indicating a beneficial influence of daily breakfast on body fat in this particular group.

© 2012 Society for Adolescent Health and Medicine. All rights reserved.

* Address correspondence to: Sonia Gómez-Martínez, Ph.D., Immunonutrition Research Group, Department of Metabolism and Nutrition, Institute of Food Science, Technology and Nutrition (ICTAN), Spanish National Research Council (CSIC), Calle José Antonio Novais, 10, 28040 Madrid, Spain.

E-mail address: sgomez@ictan.csic.es (S. Gómez-Martínez).

S.G.M. and D.M.G. contributed equally to this work.

Obesity is a chronic disease associated with early development of cardiovascular diseases, diabetes, and cancer, which are among the most prevalent derived pathologies. The etiology of obesity has a multifactor origin, in which apart from genetic factors, lifestyle habits seem to play an important role in both its triggering and its development [1,2]. Special attention needs to be given to childhood obesity because many studies have pointed out that obese children are more likely to become obese

adults [1]. It is noteworthy that obesity risk factors in children are particularly related to dietary factors [1,2]. The main reason for this alarming trend is the shift in nutritional and lifestyle habits caused by the increased popularity of fast foods, soft drinks, and diminished physical activity (PA). Presently, all these common upward trends are adopted by children and adolescents [1,2]. Thus, nowadays, the scientific community has begun to devote growing attention to examine the factors that influence eating behaviors and dietary quality, particularly in the most susceptible populations, such as adolescents [3].

It is important to highlight that childhood and adolescence are decisive periods in human life within which body composition and psychosociologic changes determine nutritional requirements, as well as eating and PA behavior variability [4]. The characteristic behavior patterns that show up during adolescence may produce energy unbalance and nutritional status disturbances. Prospective controlled trials to assess the protective potential of promoting regular and frequent meals in children and their families are highly desirable to strengthen the evidence base for such preventive approaches, which should explore the feasibility and effects of interventions [5]. Data from cross-sectional studies have identified several dietary patterns associated with early obesity development, such as meal frequency and distribution, skipping meals, soft drink and fast food consumption, as well as high eating speed [6].

On the other hand, regular PA seems to offer protection against a wide variety of these chronic disease-related risk factors during childhood and adolescence [7–9]. Moreover, the combination of adequate PA together with healthy dietary habits has also been shown to help prevent obesity and other nutrition-related alterations common in adolescence, such as poor bone mineralization [6,10].

Studies have shown that both dietary habits and PA independently affect the development of obesity. The current tendency is to perform cluster analyses, for example, to evaluate the combined effect of health-related factors related to a common trait; for instance, certain lifestyle habits that may increase the individual obesity risk. In this context, the specific contribution of each dietary and PA factors should be determined, but then it is necessary to know the interactions between them. However, to our knowledge, this information is lacking, and no data are available in this respect for adolescents in Spain. Therefore, the present study is aimed to evaluate the association between specific dietary habits and body fatness in Spanish adolescents, analyzing the role of leisure-time PA (LTPA) in this association.

Methods

Design and participants

The AVENA study (*Alimentación y Valoración del Estado Nutricional de los Adolescentes*/Feeding and assessment of nutritional status of Spanish adolescents) is a cross-sectional and multi-center study performed on a representative sample of urban Spanish adolescents aged between 13.0 and 18.5 years. The complete and detailed methodology of the AVENA study has been published in other studies [11,12]. Briefly, 2,859 adolescents were assessed in five Spanish cities (Granada, Madrid, Murcia, Santander, and Zaragoza) between 2000 and 2002. The AVENA study was designed to evaluate dietary patterns, anthropometry, lifestyle habits, health markers, biomarkers, and genetic markers in adolescents. Participants lacking the complete and valid PA

and anthropometric measurements were excluded, and thus, the final sample for the present study was 961 boys and 1,017 girls ($n = 1,978$). The protocol for the study was approved by the Review Committee for Research Involving Human Subjects from Marqués de Valdecilla University Hospital (Santander, Spain).

Anthropometric assessment

Harmonization and standardization of anthropometric measurements within the AVENA study have been detailed elsewhere [13]. Anthropometric measurements were taken on bare-foot participants wearing only undergarments. Therefore, body weight (kg) was estimated without shoes and with light clothing, and measured to .05 kg by using a standard beam balance. Body height was measured using a stadiometer SECA 714 (range, 60–200 cm [Seca, Hamburg, Germany]). Skinfold thickness was measured on the left side of the body with a Holtain caliper at the following sites: (1) triceps, halfway between the acromion process and the olecranon process; (2) biceps, at the same level as the triceps skinfold, directly above the center of the cubital fossa; (3) subscapular, approximately 20 mm below the tip of the scapula, at an angle of 45 degrees to the lateral side of the body; (4) suprailiac, about 20 mm above the iliac crest and 20 mm toward the medial line; (5) thigh, in the midline of the anterior aspect of the thigh, midway between the inguinal crease and the proximal border of the patella; (6) calf, at the level of maximum calf circumference, on the medial aspect of the calf. Waist circumference (WC) was measured with an inelastic tape between the lowest rib and iliac crest, at the end of a gentle expiration. In the present study, the sum of six skinfolds (sum6) was used as a marker of total body fat, whereas WC was used as a marker of abdominal fat.

Dietary habits

Adolescents' eating behaviors were assessed by questionnaire. The participants were asked whether they usually consumed commercially ready-to-eat foods (yes or no), about their eating speed (medium or quick), and about the frequency and distribution of the following meals: breakfast, mid-morning snack, lunch, afternoon snack, dinner, and nighttime snack. Soft drink consumption was assessed using a 24-hour diet recall. The 24-hour recall was administered throughout the year to avoid seasonal variations; questionnaires were administered homogeneously from Monday to Friday. A nutrient database software (Grunumur, Murcia, Spain) [14] was used to define soft drinks as caloric soft drinks, colas, and isotonic drinks. Sugar-free soft drinks were not included in the analysis. Data were categorized as "yes" (when participants consumed any kind of soft drinks) or "no" (when consumption of these drink was null).

Physical activity patterns

Participation in LTPA was determined from the following question: "Do you undertake any physical sporting activity after school?" Adolescents had to select "yes" or "no."

Statistical analysis

Data are presented as mean \pm standard deviation unless otherwise stated. First, the distribution of continuous variables was assessed for normality before analyses. Differences between ad-

Download English Version:

<https://daneshyari.com/en/article/1078718>

Download Persian Version:

<https://daneshyari.com/article/1078718>

[Daneshyari.com](https://daneshyari.com)