Fluid Intake Habits of Spanish Children and Adolescents: An Update of the Liq.In7 Survey

Iris Iglesia-Altaba^{a, b, c} Maria Luisa Miguel-Berges^{a, b} Clementine Morin^d
Luis A. Moreno-Aznar^{a, b, e}

^aGrowth, Exercise, Nutrition and Development (GENUD) Research Group, Instituto Agroalimentario de Aragón (IA2), Universidad de Zaragoza, Zaragoza, Spain; ^bInstituto de Investigación Sanitaria Aragón (IIS Aragón), Zaragoza, Spain; ^cRed de Salud Materno-Infantil y del Desarrollo (SAMID), Instituto de Salud Carlos III, Madrid, Spain; ^dWater Science Team, Danone Research, Palaiseau, France; ^eCentro de Investigación Biomédica en Red de Fisiopatología de la Obesidad y la Nutrición (CIBEROBN), Instituto de Salud Carlos III, Madrid, Spain

Keywords

Hydration habits · Spanish youths · Liq.In7 survey · Beverages intake

Abstract

Introduction: Insufficient and unhealthy total fluid intake (TFI), especially in early stages of life, may have negative health impact [1]. Understanding how fluid consumption may differ throughout the day or as a function of location could help drive policy initiatives to encourage healthier drinking habits, especially in young population groups, so this study assesses current patterns of fluid consumption in children and adolescents in Spain, including drinking occasions and locations and to compare TFI with the adequate intake of water from fluids recommended by the European Food Safety Authority (EFSA) [2]. **Methods:** Our analyses were based on a Spanish cross-sectional study assessing TFI from all sources of fluid consumption according to occasions of the day and location, using a validated liquid intake 7-day record (Liq.In7), details of which can be found elsewhere [3]. Data collection occurred in spring 2018. A sample of 146 (63% boys) children (4–9 years old) and adolescents (10–17 years old) was included (Table 1). Parents reported such in-

formation in case children were younger than 16 years. The header categories of fluid consumption were water, milk and derivatives, hot beverages, sugar-sweetened beverages (SSBs), fruit juices, artificial non-nutritive sweetened beverages, alcoholic beverages, and others. Regarding occasions, the analyzed categories were main meals (breakfast, lunch, and dinner), snacks (mid-morning, mid-afternoon, after-dinner) and outside meals. Considered occasions were home, school/university/work, and other. **Results:** A high proportion of children and adolescents did not meet EFSA-derived reference values for fluid intake (73% and 72%, respectively) (Fig. 1). Forty percent of children and around 50% of adolescents consumed at least one serving of SSB per day, while about 20% consumed only one or less serving of water per day. Consumption during main meals was most important for both children and adolescents (representing 50% and 54% of TFI, respectively) and was mainly driven by water (62%). The consumption at home in children (70% of TFI) was made of water (47%). In the same way, at school, water was contributing to half of the intake. However, adolescent girls at school drink more SSB (41%) than water (34%), being the highest consumed fluid. At other locations, adolescent boys also drink more SSBs (51%) than either water (29%) or milk and derivatives (10%). **Conclusion:** Drinking habits of Span-

ish young populations are far away from current recommendations because a low fluid intake, specifically water, and a high proportion of SSB consumption in children and adolescents. Interventions that assure achieving EFSA TFI recom-

mendations are of special importance for children and adolescents, with, according our results, a special focus in male adolescents.

© 2022 The Author(s).
Published by S. Karger AG, Basel

Table 1. General overview of the sample

	4–9 years	10–17 years
Sample size, <i>N</i> (%)	65 (45)	81 (55)
Females	27 (42)	27 (33)
Males	38 (58)	54 (67)

Fig. 1. Percentage (%) of participants according to their adherence to the EFSA AI recommendations for water from fluids. EFSA, European Food Safety Authority; AI, adequate intake.

Acknowledgements

The first author was funded by Red de Salud Materno Infantil y del Desarrollo (SAMID) (RETICS funded by the Instituto de Salud Carlos III – ISCIII, Ref: RD16/0022) with the contribution of the European Regional Development Fund (FEDER). Data collection was performed by Harris Interactive and the survey was funded by Danone Waters Spain.

Statement of Ethics

No Ethical Committee was required. Individuals who agreed to participate in the study received detailed information about the survey's objectives (expectations, confidentiality rules, etc.). Following these additional information and the principles of informed consent, parents or the caregivers were asked for their approval to participate. Moreover, for children and adolescents under the age of 16 years, a single parent was responsible for completion of the questionnaires. The participants or their parents could fill in the questionnaire up to 48 h from the actual time of drinking.

Conflict of Interest Statement

Clementine Morin is a full-time employee of Danone Research. Maria Luisa Miguel Berges reports no conflicts of interest, while Luis A. Moreno is a member of the Scientific Committee of Danone Institute (Spain) and received consultancy fees from Danone Waters Spain. Iris Iglesia-Altava has received fees from Danone Research for the lecture at the conference.

Funding Sources

The survey was funded by Danone Waters Spain.

Data Availability Statement

The datasets used in the current study are available from the corresponding author on reasonable request.

References

- 1 Perrier ET, Armstrong LE, Bottin JH, Clark WF, Dolci A, Guelinckx I, et al. Hydration for health hypothesis: a narrative review of supporting evidence. *Eur J Nutr*. 2021;60(3):1167–80.
- 2 EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). Scientific opinion on the substantiation of health claims related to water and maintenance of normal physical and cognitive functions, maintenance of normal thermoregulation and “basic requirement of all living things.” *EFSA J*. 2011;9(4):2075.
- 3 Johnson EC, Péronnet F, Jansen LT, Capitan-Jiménez C, Adams JD, Guelinckx I, et al. Validation testing demonstrates efficacy of a 7-day fluid record to estimate daily water intake in adult men and women when compared with total body water turnover measurement. *J Nutr*. 2017; 147(10):2001–7.