

Supplemental material

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Methods

Sample

Briefly, CORALS is a prospective ongoing multicentre cohort study conducted in preschool children from 7 Spanish cities, which aims to identify and assess the risk factors that contribute to the development of obesity in childhood. MELIPOP is a multicentre parallel, randomized controlled intervention trial including children aged 3 to 6 years-old at risk of obesity. MELIPOP aims to assess whether a healthy lifestyle intervention during childhood, based on the promotion of a Mediterranean diet and regular physical activity decreases the incidence of obesity at long term.

COME-Kids food and beverages frequency questionnaire.

The COME-Kids F&B-FQ was designed based on the adaptation of the validated adult FFQ used in the PREDIMED study (PREvención con DIeta MEDiterránea) [1], considering also the amounts and types of food specifically consumed by children aged between 3 and 11 years.

From the original version, which included 146 items, relevant modifications were made especially in relation to the serving size of usual consumption and the number of items of vegetables and fruits that were reduced in a few categories (PREDIMED version n=35 vs COME-Kids version n=16), grouping them according to their nutritional composition and avoiding potential overestimation due to a high number of items [2]. Some food items more commonly consumed by children (for instance: jellybeans, popcorn, bread sticks) and food items that have gained popularity recently (plant-based beverages, lactose-free milk; energy drinks) were included in the new questionnaire. In addition, in contrast to the original version, the present questionnaire separately captures yogurt and cereals with

and without added sugar and their whole or refined versions to facilitate discrimination in their nutrient content.

The items corresponding to alcoholic beverages from the original version were removed and a beverage section was added including those that are usually consumed by children, including bottled and tap water.

The frequency response options consisted as follows: never; 1-3 times per month; 1 time per week; 2-4 times per week; 5-6 times/week; 1 time per day; 2-3 times per day; 4-6 times per day and more than 6 times per day.

Study procedure

For recruitment, parents or caregivers were invited to participate through a letter sent by the staff of each school informing them about the study. Those who accepted to participate were interviewed by telephone or in-person and asked to attend the baseline visit.

Registered dietitians from each recruitment centre attended group training sessions to harmonize criteria and minimize potential inter-interviewer bias, recognized as a major contributor to variation in the data collected [3].

Baseline visit: Face-to-face, trained registered dietitians administered the F&B-FQ₁ to the participant's parents/caregivers in case of children <10 years old and handed over the first 3d-DR. For that, they were instructed to provide a detailed description of the type of consumed food, recipes, brand names and servings in grams or household measures (spoon, glass, cups, etc.). In addition, parents/caregivers were also advised to take pictures of the plate prior to food intake, to improve the accuracy of the amount of food and beverage consumed.

When registered dietitians explained the procedure to complete the 3d-DR, they emphasized that the objective of this record was to capture the children's usual diet so they were requested not to change the child's standard diet. Furthermore, to estimate the

food intake from different days of the week and to avoid systematic errors arising from repeated intakes on the same days of the week, a sequence of weekly days was indicated to the parents in order to collect the dietary records according to the participant's coding. Parents or caregivers also completed self-administered questionnaires assessing sociodemographic and education data of the family. The weight and height of participants were measured by trained registered dietitians. Weight status was estimated according to body mass index (BMI) and categorized in underweight, normal weight, overweight or obesity according to the cut-off points defined by Cole et al [4].

Visit at 2 ± 1 week and at 6 months: The second questionnaire (F&B-FQ₂) was administered as well as the instructions to complete the second 3d-DR provided. Around one week before the 6-month visit, parents/caregivers were reminded to complete this 3d-DR for the next scheduled visit.

One-year visit. Around one week before the one-year visit parents/caregivers were contacted again and reminded to complete the 3d-DR for the scheduled visit. The F&B-FQ₃ was administered, and the third 3d-DR was accurately reviewed as previously described.

Given the COVID-19 pandemic, those visits that concurred with the lockdown period were facilitated through videoconference or telephone calls being the 3d-DR template sent by e-mail to be completed.

1. Fernández-Ballart JD, Piñol JL, Zazpe I, et al (2010) Relative validity of a semi-quantitative food-frequency questionnaire in an elderly Mediterranean population of Spain. *Br J Nutr* 103:1808–1816. <https://doi.org/10.1017/S0007114509993837>
2. Willet W (1998) Reproducibility and validity of food-frequency questionnaires, 2nd editio. New York: Oxford University Press
3. Gavrieli A, Trichopoulou A, Valsta LM, et al (2019) Identifying sources of measurement error in assessing dietary intakes - Results of a multi-country ring-trial. *Nutr Metab Cardiovasc Dis* 29:127–134. <https://doi.org/10.1016/J.NUMECD.2018.10.011>
4. Cole TJ, Lobstein T (2012) Extended international (IOTF) body mass index cut-offs for thinness, overweight and obesity. *Pediatr Obes* 7:284–294. <https://doi.org/10.1111/j.2047-6310.2012.00064.x>

Flow chart

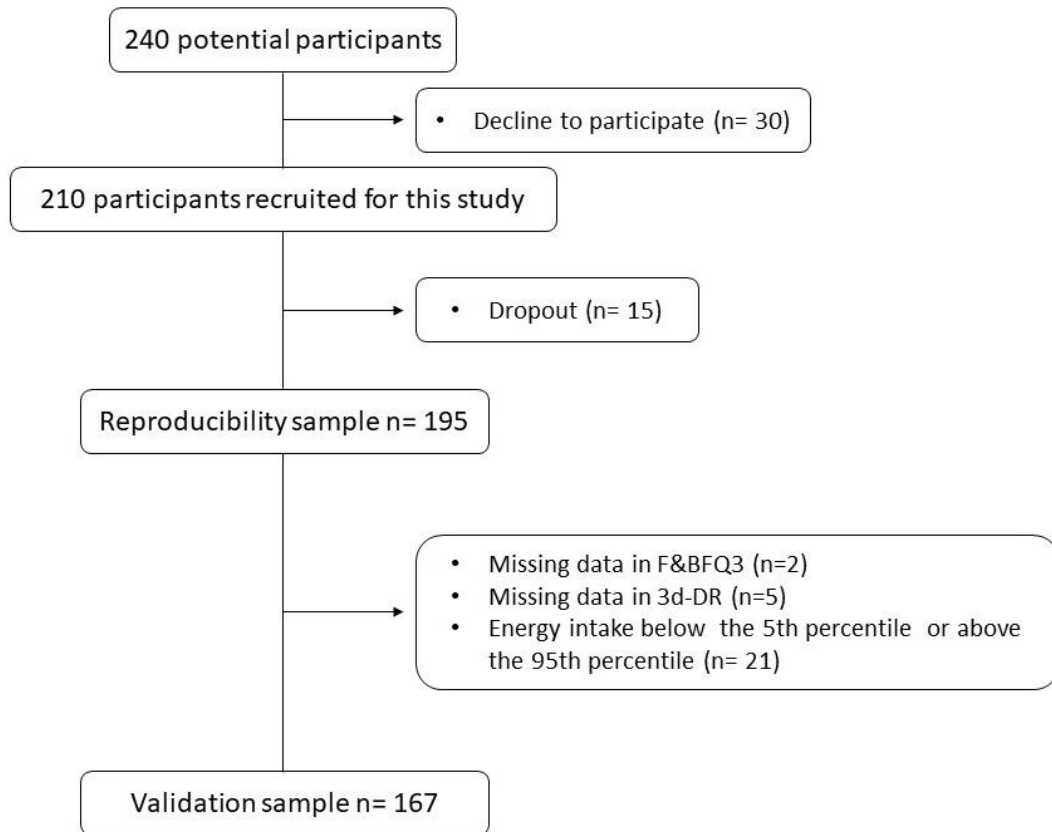


Figure 2. Flow chart of the study sample.

Please check only one option for each food.

Current data					
Día		Mes		Año	
0	0	0	0	0	0
1	1	1	1	1	1
2	2		2	2	2
3	3		3		3
	4		4		4
	5		5		5
	6		6		6
	7		7		7
	8		8		8
	9		9		9

[illegible]

Please check only one option for each food.			AVERAGE CONSUMPTION OVER THE PAST YEAR								
One 50-80g plate or portion, except when another quantity is indicated.			NEVER OR ALMOST NEVER	TIMES PER MONTH	TIMES PER WEEK			TIMES PER DAY			
				1-3	1	2-4	5-6	1	2-3	4-6	6+
III. VEGETABLES	43	Vegetables A* (chard, spinach, endive, lettuce,...)									
	44	Vegetables B** (pumpkin, beans, tomato, carrots,...)									
	45	Garlic (1/2 clove)									
	46	Mushrooms, chanterelles									
	47	Baked or boiled potatoes									
	48	Homemade fried potato chips (1 portion, 80g)									
	49	Potato crisps (1 bag, 50g)									
	50	Vegetable soup (1 glass, 200cc)									

* A vegetables: Chard, artichoke, celery, watercress, broccoli, zucchini, cardoon, cauliflower (frozen or raw), endive, endive, white asparagus (canned or peeled and raw), spinach (raw or frozen), fennel, lettuce, cucumber, bell bell pepper, radish, bean sprouts.

** B vegetables: Eggplant, squash, white onion, Brussels sprouts, red cabbage, cabbage, green beans (raw and frozen), turnip, hearts of palm (canned), red bell pepper, leek, tomato, carrot.

One 100g piece or portion, except where otherwise indicated.			AVERAGE CONSUMPTION OVER THE PAST YEAR								
			NEVER OR ALMOST NEVER	TIMES PER MONTH	TIMES PER WEEK			TIMES PER DAY			
				1-3	1	2-4	5-6	1	2-3	4-6	6+
IV. FRUITS	51	Citrus fruits (tangerine, orange, grapefruit)									
	52	Banana (1unit)									
	53	Fresh fruits (all except banana or citrus fruits)									
	54	Kiwi (1 piece, 100g)									
	55	Fruit in syrup (peach, pear) (1/2 piece)									
	56	Dates, dried figs, raisins, prunes (20g)									
	57	Olives (10 units)									
	58	Nuts (almonds, hazelnuts, walnuts) (15-20g) 1 handful the size of the child's hand									

			AVERAGE CONSUMPTION OVER THE PAST YEAR								
1/2 small cup (uncooked weight, 40g)			NEVER OR ALMOST NEVER	TIMES PER MONTH	TIMES PER WEEK			TIMES PER DAY			
				1-3	1	2-4	5-6	1	2-3	4-6	6+
V. LEGUMES AND CEREALS	59	Legumes (lentils, white beans, chickpeas)									
	60	Peas									
	61	White bread (loaf, baguette...) (1 slice, 25g)									
	62	White bread, sandwich loaf (1 piece, 25g)									
	63	Breadsticks, donuts, bagels and similar (3-4 pieces or 1 bagel)									
	64	Brown or whole-wheat bread (1 slice, 25g)									
	65	Unsweetened breakfast cereals (30g)									
	66	Sweetened breakfast cereals (30g)									
	67	Chocolate-filled sweetened breakfast cereals (30g)									
	68	Whole grain cereals: muesli, oat flakes, all-bran (30g)									
	69	White rice (40g raw)									
	70	Brown rice (40g raw)									
	71	Pasta: noodles, macaroni, spaghetti... (40g raw)									
	72	Whole-wheat pasta (40g raw)									
	73	Pizza (60-80g portion)									

		AVERAGE CONSUMPTION OVER THE PAST YEAR								
How often do you consume...?		NEVER OR ALMOST NEVER	TIMES PER MONTH	TIMES PER WEEK			TIMES PER DAY			
			1-3	1	2-4	5-6	1	2-3	4-6	6+
74	In fast food restaurants									

Please check only one option for each food.			AVERAGE CONSUMPTION OVER THE PAST YEAR								
One tablespoon or individual serving. For frying, spreading, dipping in bread, dressing or for salads, use in total:			NEVER OR ALMOST NEVER	TIMES PER MONTH	TIMES PER WEEK			TIMES PER DAY			
				1-3	1	2-4	5-6	1	2-3	4-6	6+
VI. OILS AND FATS	75	Olive oil (10cc, 1 tablespoonful)									
	76	Virgin olive oil (10cc, 1 tablespoonful)									
	77	Pomace olive oil (10cc, 1 tablespoonful)									
	78	Corn oil (10cc, 1 tablespoonful)									
	79	Sunflower oil (10cc, 1 tablespoonful)									
	80	Soybean oil (10cc, 1 tablespoonful)									
	81	Mixture of the above (10cc, 1 tablespoonful)									
	82	Margarine (single serving, 12g)									
	83	Butter (single serving, 12g)									

Bland-Altman plots for all food groups and nutrients

