CLINICAL RESEARCH STUDY

THE AMERICAN JOURNAL of MEDICINE®

Targeting Preschool Children to Promote Cardiovascular Health: Cluster Randomized Trial

Jaime Céspedes, MD,[a] German Briceño, MD, MSc,[a] Michael E. Farkouh, MD, MSc,[b,c] Rajesh Vedanthan, MD, MPH,[b] Jorge Baxter, MA,[d] Martha Leal, MD, MSc,[a] Paolo Boffetta, MD, PhD,[b] Mark Woodward, MSc,[e] Marilyn Hunn,[b] Rodolfo Dennis, MD, MSc,[a] Valentin Fuster, MD, PhD[b,f]

[a]Fundación Cardioinfantil Instituto de Cardiologia, Bogotá, Colombia; [b]Mount Sinai School of Medicine, New York, NY; [c]Peter Munk Cardiac Centre and Li Ka Shing Knowledge Institute, University of Toronto, Toronto, Canada; [d]Sesame Workshop, New York, NY; [e]George Institute, University of Sydney, Australia; [f]Centro Nacional de Investigaciones Cardiovasculares (CNIC), Madrid, Spain.

ABSTRACT

BACKGROUND: School programs can be effective in modifying knowledge, attitudes, and habits relevant to long-term risk of chronic diseases associated with sedentary lifestyles. As part of a long-term research strategy, we conducted an educational intervention in preschool facilities to assess changes in preschoolers' knowledge, attitudes, and habits toward healthy eating and living an active lifestyle.

METHODS: Using a cluster design, we randomly assigned 14 preschool facilities in Bogotá, Colombia to a 5-month educational and playful intervention (7 preschool facilities) or to usual curriculum (7 preschool facilities). A total of 1216 children aged 3-5 years, 928 parents, and 120 teachers participated. A structured survey was used at baseline, at the end of the study, and 12 months later to evaluate changes in knowledge, attitudes, and habits.

RESULTS: Children in the intervention group showed a 10.9% increase in weighted score, compared with 5.3% in controls. The absolute adjusted difference was 3.90 units (95% confidence interval [CI], 1.64-6.16; $P < .001$). Among parents, the equivalent statistics were 8.9% and 3.1%, respectively (absolute difference 4.08 units; 95% CI, 2.03 to 6.12; $P < .001$), and among teachers, 9.4% and 2.5%, respectively (absolute difference 5.36 units; 95% CI, −0.29-11.01; $P = .06$). In the intervened cohort 1 year after the intervention, children still showed a significant increase in weighted score (absolute difference of 6.38 units; $P < .001$).

CONCLUSIONS: A preschool-based intervention aimed at improving knowledge, attitudes, and habits related to healthy diet and active lifestyle is feasible, efficacious, and sustainable in very young children.
 • The American Journal of Medicine (2013) 126, 27-35

KEYWORDS: Cardiovascular disease (CVD); Global health; Health education; Noncommunicable disease (NCD); Preschool children

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Noncommunicable diseases are responsible for the majority of deaths throughout the world.[1] According to the World Bank, 56% of all deaths in low- and middle-income countries may be attributed to noncommunicable diseases, mainly cardiovascular diseases,[2] and by 2020, 80% of all deaths may be attributed to these diseases.[3] The growing burden of these diseases stresses the need for population-based studies on effective strategies for their primary prevention in both developed and developing nations.

There is growing evidence that negative health behaviors initiated in childhood may persist through adulthood, leading to risk factors of cardiovascular disease and other chronic diseases.[4,5] This represents an opportunity for primary prevention, particularly in low- and middle-income countries, where rapid changes are occurring in chronic

Funding: Santo Domingo Foundation.

Conflict of Interest: None.

Authorship: All authors had access to the data and a role in writing this manuscript.

Requests for reprints should be addressed to Valentin Fuster, MD, PhD, Mount Sinai Cardiovascular Institute, Mount Sinai School of Medicine, One Gustave L. Levy Place, New York, NY 10029.

E-mail address: valentin.fuster@mssm.edu

0002-9343/$ -see front matter © 2013 Published by Elsevier Inc.
http://dx.doi.org/10.1016/j.amjmed.2012.04.045

disease-relevant behaviors.[6] School and community programs that promote regular physical activity are recommended toward reducing the burden of chronic diseases associated with sedentary lifestyle and obesity.[7-10]

We therefore decided to design and implement a long-term pedagogic and communication research program aimed at developing and evaluating effective strategies for modifying knowledge, attitudes, and habits of preschool children and other stakeholders in Colombia.

Over a 5-month period, we assessed the impact on children's knowledge, attitudes, and habits towards healthy eating and living an active lifestyle following a preschool-based intervention. As secondary objectives, we evaluated parents' and teachers' knowledge, attitudes, and habits, changes in children's nutritional status, and body mass index (BMI), the association between children's BMI and knowledge, attitudes, and habits, and changes in knowledge, attitudes, and habits 12 months after the intervention ended.

CLINICAL SIGNIFICANCE

- Preschool-aged children undergoing this Healthy Habits intervention had a significant improvement in their cardiac well-being.
- The study also saw a positive outcome of knowledge, attitudes, and habits on parents and teachers.
- The intervention appears to have durability when evaluated 1 year later.

METHODS

Study Design

We conducted a cluster, randomized controlled trial in 14 preschool facilities in Usaquén (Bogotá, Colombia) between May and November, 2009. Usaquén represents the different socioeconomic status levels seen in Colombia, and includes an underprivileged community with a high migration rate. Randomization occurred at the preschool facility level. We used a blinded randomization assignment schedule, concealed until treatments had been allocated. All children 3-5 years of age at baseline, and their parents and teachers, were eligible. We excluded children, parents, or teachers who had received formal training in healthy habits, nutrition, or physical activity in the 6 months before the study and children whose parents did not consent.

It was assumed that the improvement rate in knowledge, attitudes, and habits in the control group would be 5%. A total sample size of 1043 children was calculated based on being able to detect a doubling of the improvement rate under the intervention, with 80% power, a 2-sided 5% significance test, and 1:1 allocation. We estimated 10% losses to follow-up. Institutional review board approval was obtained from both the Mount Sinai School of Medicine and Fundación Cardioinfantil in Bogotá.

Study Intervention

Based on the knowledge that negative health behaviors initiated in childhood that persist through adulthood can be risk factors that predict chronic diseases,[4,5] we designed an intervention based on social cognitive theory and the transtheoretical model in health promotion,[11] which was incorporated in a ludic and pedagogical strategy teaching preschool children key messages on the importance of healthy eating and living an active lifestyle in 3 integrated areas: body and heart, nutrition, and physical activity.

The intervened children were provided classroom educational and playful activities during 5 months, which included Sesame Workshop Healthy Habits storybooks, posters, videos, games, and songs (1 hour daily); a "Healthy family day" workshop (1 hour); and weekly health notes. Parents participated in 3 workshops and weekly notes containing positive health messages about nutrition and active lifestyles to share with their children. Teachers also participated in 3 centralized training sessions, plus personalized working sessions with a research supervisor (2 hours every 15 days), and received a teacher's guide (Appendix 1, online only). Meanwhile, the control preschool facilities continued with their usual preschool curriculum. As part of a requirement of a local institutional review board, these preschool facilities were provided with a similar intervention of 8 months, after the initial 5-month study ended.

Study Measurements

We developed questionnaires to measure knowledge, attitudes, and habits on healthy eating and living an active lifestyle in children, parents, and teachers. A panel composed of experts in psychology, qualitative research, pediatrics, nutrition, child development, and education was convened to ensure face and content validity of the instruments, based on item identification and extraction from published and unpublished questionnaires.[12,13]

The surveys were pilot tested in groups of children 3-5 years old (n = 20), parents, and teachers (n = 20). The final children questionnaire contained 21 simple items (10 for knowledge, 6 for attitudes, and 5 for habits) and used age- and sex-appropriate photographs to frame each question. The parent and teacher questionnaire had 28 and 30 items, respectively (Appendix 2, online only).

Children's, parents', and teachers' knowledge, attitudes, and habits were measured by a group of trained psychologists using a standardized protocol, blinded to intervention status. Study population was initially measured in May 2009, immediately before randomization and intervention allocation. The intervention was administered between June and October, 2009, and the second measurement was performed in November 2009 in all 14 preschool facilities. To assess long-term changes, the study population was again evaluated 12 months after the intervention ended.

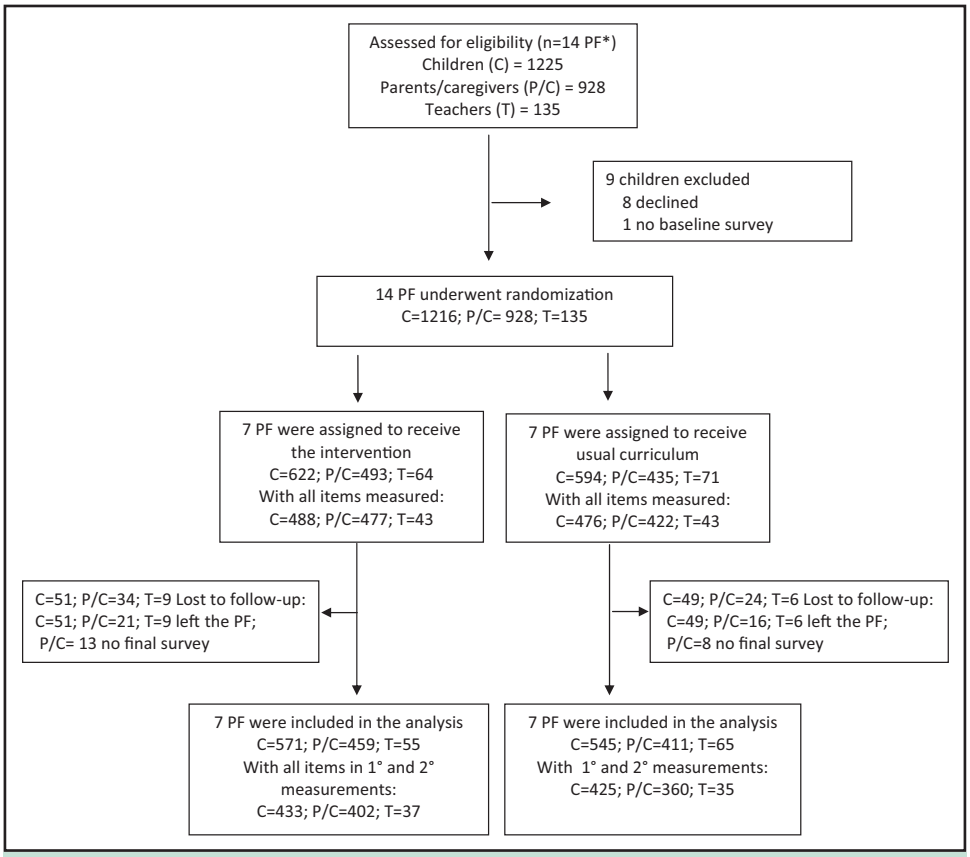

Figure 1 Enrollment, randomization, and follow-up of study population.
*(PF) = preschool facilities.

Children's height and weight were measured by nutritionists, using standard techniques.[14] Nutritional status of children was assessed using the Centers for Disease Control and Prevention growth charts for age (in months) and sex for BMI,[15] with children classified as malnourished if BMI is < -2 SD, risk of malnourished (-2 SD and < -1 SD), eutrophic (-1 SD and $+1$ SD), overweight ($> +1$ and $+2$ SD), and obese ($> +2$ SD). Socioeconomic status was measured with a tool used routinely by the Colombian government.[16]

Outcomes

The primary outcome was the mean change in children's knowledge, attitudes, and habits related to healthy eating and living an active lifestyle. Secondary outcomes were the mean change in parents' and teachers' knowledge, attitudes, and habits about healthy eating and living an active lifestyle. Baseline and end-of-study scores were initially standardized to a scale of 0-100. Because we hypothesized that the mean change in knowledge scores associated with this short intervention period would be larger than the mean changes in scores due to attitudes and habits, we a priori gave differential weights (70, 20, and 10, respectively) to the scores to compose a standardized weighted total score. We also evaluated changes in children's nutritional status and BMI, as well as the association between children's BMI and knowledge, attitudes, and habits.

To explore the long-term impact of the intervention at 12 months after study completion, we evaluated the change in knowledge, attitudes, and habits scores and BMI in the intervened cohort. This analysis was performed on those subjects with complete data for all 3 measurements: baseline, 6, and 18 months. Similarly, we report results on the effects of the 8-month intervention in the initial control group.

Statistical Analysis

All analyses were performed according to a predefined statistical analysis plan and were based on the intention-to-treat principle. The primary analysis was conducted in those subjects with baseline and end-of-study scores. The analyses of results at 18 months were restricted to subjects with nonmissing data at all 3 measurements. The effect of the intervention was evaluated using generalized estimating equations models. Changes between baseline and end-of-study scores were modeled as the outcome, randomization assignment as the independent predictor variable of interest, and subject's preschool facilities as the clustering variable. We also used generalized estimating equations models to assess interactions between variables, specifically children's

Table 1 Baseline Summary Statistics by Intervention Group

Variable	Preschool Facility* Intervention Arm n (%)	Preschool Facility Control Arm n (%)	*P*-Value
Children			
Number of children included	622 (51.2)	594 (48.9)	
Age (years)			.15
3	342 (55.0)	309 (52.0)	
4	270 (43.4)	266 (44.8)	
5	10 (1.6)	19 (3.2)	
Socioeconomic status of the neighborhood where the preschool facility is located			.50
1-2	4 (57.1)	5 (71.4)	
3-4	3 (42.9)	2 (28.6)	
Children's sex			.65
Girls	296 (47.6)	275 (46.3)	
Children's nutritional status by BMI			<.01
Risk of undernourished	46 (8.2)	60 (11.2)	
Undernourished	25 (4.5)	39 (7.3)	
Eutrophic	358 (63.9)	324 (60.2)	
Overweight	115 (20.54)	103 (19.14)	
Obese	16 (2.9)	12 (2.2)	
Parents or caregivers			
Number of parents included	493 (53.1)	435 (46.9)	
Age mean (SD)	31.25 (8.1)	29.94 (6.8)	.01
Female	412 (83.6)	373 (85.8)	.36
Teachers			
Number of teachers included	64 (47.4)	71 (52.6)	
Age Mean (SD)	39.04 (10.6)	35.05 (8.9)	.03
Female	55 (100)	64 (98.5)	1.0
Schooling level of the teachers			<.001
High school	7 (12.7)	1 (1.54)	
Technical training	17 (30.9)	46 (70.8)	
College/university	30 (54.6)	18 (27.7)	
Postgraduate	1 (1.8)	0 (0.0)	

BMI = body mass index.

age and intervention, and to assess the association between a child's BMI at baseline and their knowledge, attitudes, and habits regarding healthy eating and living an active lifestyle. We ran additional models simultaneously, adjusting by the effect of parents' and teachers' age, and children's weight.

Chi-squared test was used for the analysis of categorical variables (nutritional status) and unpaired *t*-test for between-group comparisons of BMI.

RESULTS

The total study population comprised 1216 children 3-5 years of age at baseline, 135 teachers, and 928 parents (**Figure 1**). There were no significant differences between the 2 groups with respect to baseline characteristics (**Tables 1**, **2**), except for modest differences in teachers' educational level, age in parents and teachers, and children's weight. One hundred (8.2%) children, 58 (6.3%) parents, and 15 (11.1%) teachers were lost to follow-up between baseline and 6-month measurements.

Primary Outcome

After adjustment for cluster, children's sex, age, weight, and teacher's educational level, children in the intervention group showed a larger mean increase in weighted score when compared with that of the control group ($P < .001$). The percent improvement rate in the intervention arm was 10.8% in weighted score, compared with 5.3% in controls (**Table 3**). We found a significant increase in the standardized change score for attitudes ($P < .001$) as compared with the control group, with no evidence of significant change in knowledge ($P = .30$) or habits ($P = .16$). There was no heterogeneity in adjusted weighted score change by children sex or age group; $P = .78$, and $P = .77$, respectively.

Secondary Outcomes

After adjustment for cluster, sex, and teacher's educational level, parents and teachers who received the intervention showed a larger mean increase in weighted score as compared with the control group. The difference was statisti-

Table 2 Further Baseline Summary Statistics by Intervention Group

Variable	Preschool Facility Intervention Arm n	Preschool Facility Intervention Arm Median (IQR)	Preschool Facility Control Arm n	Preschool Facility Control Arm Median (IQR)	*P*-Value
Children					
Baseline total score	488	64.1 (56.8-71.3)	476	63.97 (57.0-69.8)	.39
Baseline score on knowledge	561	77.1 (65.7-88.6)	538	77.1 (65.7-88.5)	.79
Baseline score on attitudes	591	50.0 (50.0-66.7)	569	50.0 (50.0-66.7)	.65
Baseline score on habits	550	60.0 (40.0-70.0)	533	60.0 (40.0-70.0)	.13
Baseline weighted (70/20/10) score	488	71.0 (63.6-79.3)	476	71.3 (62.5-79.0)	.84
Parents					
Total baseline score	477	67.0 (61.4-73.1)	422	67.4 (58.1-73.1)	.07
Baseline score on knowledge	485	70.0 (60.0-80.0)	433	70.0 (60.0-80.0)	.07
Baseline score on attitudes	485	75.0 (66.0-82.1)	429	73.2 (64.3-80.4)	.06
Baseline score on habits	492	62.5 (50.0-68.8)	429	56.3 (43.8-68.8)	.28
Baseline weighted (70/20/10) score	477	69.1 (62.5-77.2)	422	69.6 (60.2-76.7)	.11
Teachers					
Total baseline score	43	77.8 (69.2-84.2)	43	73.9 (70.7-79.3)	.34
Baseline score on knowledge	49	80.0 (70.0-90.0)	57	70.0 (70.0-80.0)	.39
Baseline score on attitudes	51	78.8 (73.2-89.2)	58	80.4 (71.4-89.3)	.91
Baseline score on habits	50	75.0 (62.5-79.2)	54	75.0 (62.5-79.1)	.88
Baseline weighted (70/20/10) score	43	76.6 (68.9-85.0)	43	72.0 (68.4-79.9)	.19

IQR = interquartile range.

cally significant in parents (difference 5.8%, $P < .001$) but not in teachers (difference 7.0%, $P = .06$) (**Table 3**). Intervened parents had significant increases in scores for knowledge ($P = .001$) and attitudes ($P < .001$) when compared with the control group, while the increase in habits did not reach the formal level of significance ($P = .06$) (**Table 3**). Intervened teachers increased the scores significantly for attitudes ($P = .01$) and habits ($P = .05$) when compared

Table 3 Change Score in Knowledge, Attitudes, and Habits by Study Group, Controlling for Cluster Effect, Sex, Age, Children's Weight, and Teacher's Educational Level after 5-Month Intervention

Group	Within-group Differences: Intervention Arm n (Mean)	Within-group Differences: Control Arm n (Mean)	Difference (95% CI)	*P*-Value
Children				
Knowledge	503 (14.36)	484 (12.35)	2.01 (−1.72-5.74)	.29
Attitudes	539 (0.99)	522 (−7.48)	8.47 (4.79-12.14)	<.001
Habits	498 (−20.05)	485 (−29)	8.95 (−3.39-21.29)	.16
Change in WTS	433 (7.66)	425 (3.76)	3.90 (1.64-6.16)	<.001
Change (%)	10.9	5.4		
Parents				
Knowledge	440 (6.44)	396 (2.39)	4.05 (1.64-6.46)	<.01
Attitudes	422 (5.52)	382 (2.69)	2.83 (1.20-4.47)	<.001
Habits	445 (6.98)	393 (3.36)	3.62 (−0.25-7.50)	.06
Change in WTS	402 (6.12)	360 (2.04)	4.08 (2.03-6.12)	<.001
Change (%)	8.9	3.1		
Teachers				
Knowledge	46 (11.6)	51 (5.71)	5.89 (−0.51-12.30)	.07
Attitudes	48 (1.27)	53 (−4.85)	6.12 (1.38-10.86)	.01
Habits	45 (10.59)	53 (5.31)	5.28 (0.01-10.55)	.05
Change in WTS	37 (7.24)	35 (1.88)	5.36 (−0.29-11.01)	.06
Change (%)	9.5	2.5		

CI = confidence interval; WTS = weighted total score.

with the control group, with no evidence of significant changes in knowledge ($P = .07$).

Most of the children were eutrophic at baseline (692/1098; 62.11%) and in the second measurement (742/1097; 67.64%). BMI means and SDs in the intervention and control groups at baseline were 15.99 (0.09) and 15.77 (0.08), respectively, $P = .09$; and at 6 months, 16.57 (0.45) and 16.40 (0.49), respectively, $P = .810$. There were no significant differences between groups ($P = .193$). We did not find any association between children's baseline BMI and their knowledge, attitudes, and habits change.

Follow-up of the Study Cohorts at 18 Months

There were 216 (38%) children, 214 (47%) parents, and 10 (18%) teachers lost to follow-up between the 6- and the 18-month measurements in the intervention cohort. In the control cohort there were 304 (56%) children, 263 (64%) parents, and 16 (25%) teachers lost to follow-up between the 6- and the 18-month additional measurements.

In both groups, attrition was mainly due to school change or migration associated with factors such as local violence or changing jobs. There were no significant differences associated with sex or weighted score change observed after the initial 5-month period between those lost to follow-up and those remaining in the study. In both cohorts, children lost to follow-up were older (3.7 and 3.3 years, $P < .0001$; and 3.8 and 3.1 years, $P < .0001$, respectively).

In the intervened cohort 1 year after its completion, children showed a significant increase in weighted score (absolute difference of 6.38 units, $P < .001$, **Figure 2A**). Parents and teachers maintained the scores seen after 5 months (**Figure 2B, C**). In the control cohort, there was a clear increase in the weighted score in children after they received the modified intervention (absolute difference of 10.3 units, $P < .001$), as well as in teachers (absolute difference 6.1, $P = .001$), but no increase was demonstrated in parents (0.61 units, $P = .4$). Most of the children were eutrophic at baseline, 6-month, and 18-month follow-ups (**Figure 3**). There were no significant differences in the BMI in the intervened group or the control group between the 6- and 18-month measurements ($P = .2$ and $P = .5$, respectively).

DISCUSSION

In this randomized study, children of preschool age, parents, and teachers who received an intervention based on a unique program funded and implemented by a public-private partnership aimed at changing knowledge, attitudes, and habits related to healthy diet and active lifestyle, showed larger increases after 5 months in knowledge, attitudes, and habits scores when compared with a control cohort. Results in the intervened cohort were maintained or improved after 1 year. Additionally, comparable results were obtained after the initial control cohort received an 8-month intervention.

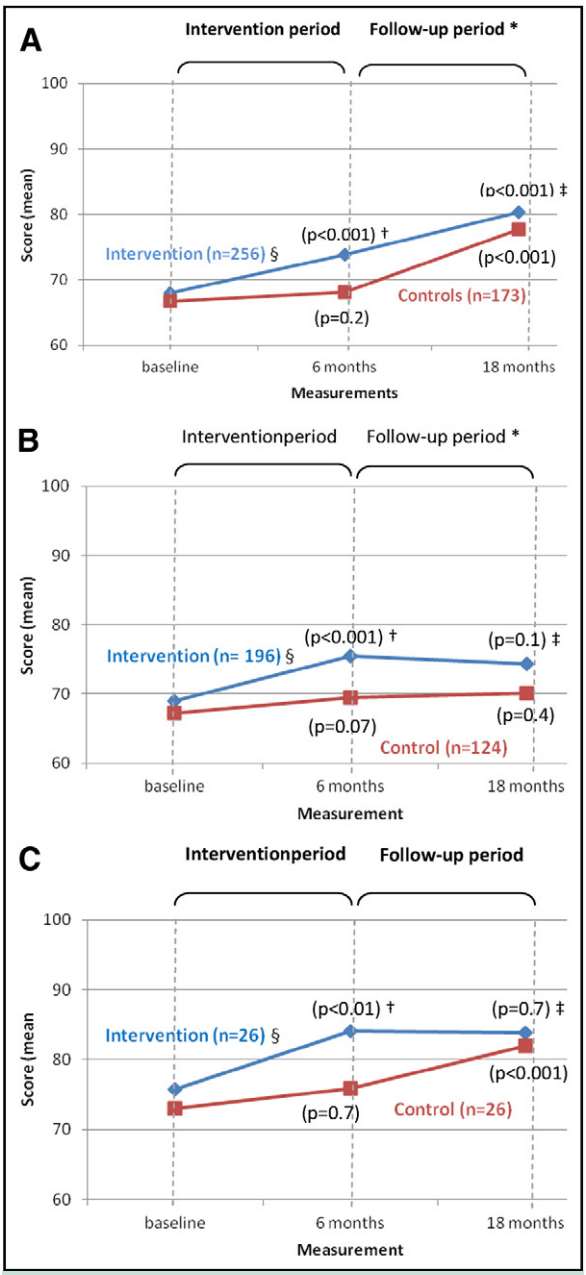

Figure 2 Changes in knowledge, attitudes, and habits in children (**A**), parents (**B**), and teachers (**C**), over the 18-month study period.

Mean values correspond to the weighted total score (WTS). The WTS assumes differential weights to knowledge, attitudes, and habits (70, 20, 10, respectively).

*During this period of time, the initial control group received an 8-month intervention.

†Statistical significance of changes obtained between baseline and 6-month measurements.

‡Statistical significance of changes obtained between 6- and 18-month measurements.

§Population with data available for all 3 measurements.

Figure 3 Distribution of children by nutritional status at baseline and 6-month and 18-month follow-ups.
BMI = body mass index.

These results contribute to the evidence that well-designed interventions targeted to young children might be an effective first step toward reducing the risk of chronic disease later in life. To the best of our knowledge, our project in preschool children in Colombia is the first such study conducted in a low- and middle-income country, and represents the proof of principle for a research program aimed at developing effective preventive strategies targeted toward preschool and elementary school children in both Colombia and Spain. A similar program in Spain (**Figure 4**, online only) involves children aged 3 to 7 years at baseline in a large number of preschool facilities and primary schools in 5 regions of the country. Our study has strengths like the cluster randomized design, a large sample size, the concomitant evaluation of parents and teachers, the structured intervention, and the evaluation process where evaluators were not aware of the status of the preschool facilities. Similar to other studies,[17,18,19] the education intervention incorporated the "fun while learning" concept into its various activities, increasing the children's attention and motivation to learn.

As with other studies,[20] our study was implemented in schools,[17,21,22] involving different influencers around the child, using a strategy with multiple components, like the provision of information about the benefits and importance of health and active living;[23,24] types of physical activity suitable for a particular age range; use of age-specific and enjoyable activities;[25-27] availability of new materials for classes;[25] and adaptable, flexible, and culturally sensitive activities based on socioeconomic status.[26,27] The effectiveness of the intervention was related to the active participation of the entire educational community, who, motivated by a desire to improve health of preschool children, were a positive influence on their eating and physical activity habits.

Some studies have shown that 2-month interventions in children and adolescents are sufficient to improve nutrition knowledge.[17,28,29] In contrast, our study observed a greater impact on children's attitudes than on their knowledge and habits,[17,30-32] with a concomitant improvement in the waste difference, which could be explained by the fact that the prior studies evaluated children over the age of 7 years (different neurodevelopmental stage).

Similar to the proportions of the 2010 National Nutritional Survey ENSIN 2010,[33] at baseline, 2.55% of the study children were obese and 19.85% were overweight. After the intervention period, the proportion of eutrophic children increased in both groups, from 62.2% to 67.0% and from 60.8% to 64.6% in the intervened and control group, respectively. Although the differences were not statistically significant, these results are encouraging and raise the hypothesis that maintaining over a longer period some elements of the pedagogical strategy in the educational community, larger changes could be observed.

This study had some limitations that could affect our results. First, although the input of the teachers in the preschool facilities was obtained for the planning and overall inclusion of the intervention into the curriculum, their participation in the initial planning stage was minimal. It is conceivable that newer interventions that include their input from the start may show even larger changes in knowledge, attitudes, and habits over time.[34,35] Second, the small number of teachers evaluated has limited the statistical power in this group. Third, while the measurement tool was devel-

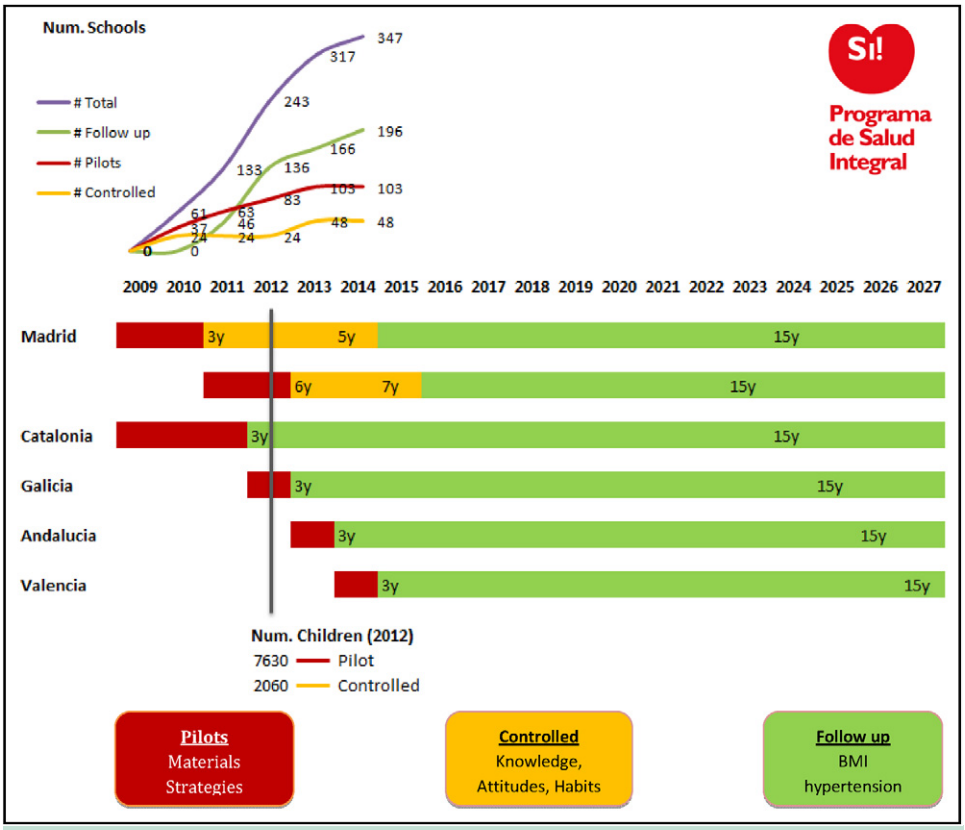

Figure 4 Program to prospectively evaluate the long-term knowledge, attitudes, and habits longitudinally in Spain.
BMI = body mass index.

oped in structured steps, formal psychometric properties are part of a study that is being currently implemented.

In conclusion, despite the relatively short duration of this intervention, results suggest that a preschool-based intervention aimed at changing knowledge, attitudes, and habits related to healthy diet and active lifestyle, is feasible, effective up to 1 year in very young children, parents, and teachers. Preschool programs are feasible, as they reach virtually all children at a relatively low cost with existing infrastructure. Further steps of our research program include an assessment of the intervention over a longer period of time, including anthropometric measurements and validated biomarkers of cardiovascular disease and metabolic syndromes, in addition to knowledge, attitudes, and habits, as well as a replication on a larger scale in preschool children in low- and middle-income countries as well as high-income countries (Spain).

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Appendix 1 Study Intervention

People	Activities (duration, frequency)
Teachers	1. Centralized training (3 sessions) ● Raise awareness about CVD in children (2 hours) ● Plan work according to the diversity of children (2 hours) ● Explore pedagogical possibilities of materials provided (2 hours) 2. Work with interventions supervisor (2 hours, c/15 days) 3. Guide for teachers (15 minutes, daily)
Children	1. Classroom activities with posters, videos, games, song (1 hour, daily) 2. Workshop: "Healthy family day" (1 hour) 3. Healthy notes (weekly)
Parents	1. Presentation of the strategy (1 hour) 2. Workshops (3 session) ● "There is Money for Health!" (1 hour) ● "Cook with/for the heart" (1 hour) ● "Healthy family day" (1 hour) 3. Healthy notes (weekly)

Appendix 2 Surveys

CHILDREN'S SURVEY

Question	Domain
KNOWLEDGE	
Body and heart	
1	Location of the heart
2	Heart changes with exercise
3	Understands what it means to be healthy
4	Recognizes what helps him/her be healthy
Nutrition	
5	Recognizes that eating fruits and vegetables every day helps him/her be healthy
6	Recognizes the foods that should be eaten once in a while
7	Recognizes that a varied diet helps him/her be healthy
Physical activity	
8	Recognizes a variety of possibilities for carrying out physical activity
9	Identifies the activities he/she should carry out every day to be healthy
10	Identifies the activities he/she should do once in a while
ATTITUDES	
Body and heart	
11	Body and heart care models
Nutrition	
12	Inappropriate nutrition models (once in a while foods)
13	Appropriate nutrition models (every day foods)
14	Appropriate nutrition models (variety of foods)
Physical activity	
15	Physical activity models (sedentarism)
16	Physical activity models (to be active)
HABITS	
Nutrition	
17	Vegetable consumption (last day)
18	Fruit consumption (last day)
19	Junk food consumption (last day)
Physical activity	
20	Physical exercise (on a typical day)
21	Sedentarism (on a typical day)

PARENTS' SURVEY

Question	Domain
KNOWLEDGE	
Body and heart	
1	Cardiovascular disease is a problem that kills people.
2	Adopting healthy lifestyle habits is one of the most important ways to protect the family's health.

Appendix 2 Continued

PARENTS' SURVEY

Question	Domain
Nutrition	
3	Recognizes which foods to eat every day in order to be healthy
4	Recognizes that there should be variety in the diet (food groups)
5	Recognizes which foods to eat once in a while in order to be healthy
6	Recognizes how to manage the food budget
Physical activity	
7	The balance between eating and physical activity is a fundamental part of good health.
8	Recognizes the benefits of avoiding sedentarism
9	Importance of providing opportunities for the children to engage in exercise
10	Knows the ideal amount of time for children to exercise
ATTITUDES	
Body and heart	
11	Adoption of healthy habits
12	Adoption of healthy habits
Nutrition	
13	Healthy diet within the budget (negative)
14	Healthy diet within the budget (positive)
15	Fruits and vegetables included in the child's daily diet
16	Fruits and vegetables included in the child's daily diet
17	Junk food avoided in the child's daily diet
18	Junk food avoided in the child's daily diet
Physical activity	
19	Provide the child with physical activity opportunities
20	Provide the child with physical activity opportunities
21	Children involved in daily physical activity
22	Children involved in daily physical activity
23	Restriction of children's sedentary activities
24	Restriction of children's sedentary activities
HABITS	
Nutrition	
25	Fruit and vegetable consumption
26	Soft drink, candy and/or fried foods consumption
Physical activity	
27	Carries out physical activity
28	Avoid sedentary activities

TEACHER'S SURVEY

Question	Domain
KNOWLEDGE	
Body and heart	
1	Cardiovascular disease is a problem that kills people.
2	Adopting healthy lifestyle habits is one of the most important ways to protect the family's health.
Nutrition	
3	Recognizes which foods to eat every day in order to be healthy
4	Recognizes that there should be variety in the diet (food groups)
5	Recognizes which foods to eat once in a while in order to be healthy
6	Recognizes how to manage the food budget
Physical activity	
7	The balance between eating and physical activity is a fundamental part of good health.
8	Recognizes the benefits of avoiding sedentarism
9	Importance of providing opportunities for the children to engage in exercise
10	Knows the ideal amount of time for children to exercise
ATTITUDES	
Body and heart	
11	Adoption of healthy habits
12	Adoption of healthy habits
Nutrition	
13	Healthy diet within the budget (negative)
14	Healthy diet within the budget (positive)
15	Fruits and vegetables included in the child's daily diet
16	Fruits and vegetables included in the child's daily diet
17	Junk food avoided in the child's daily diet
18	Junk food avoided in the child's daily diet
Physical activity	
19	Provide the child with physical activity opportunities
20	Provide the child with physical activity opportunities

Appendix 2 Continued

TEACHER'S SURVEY

Question	Domain
21	Children involved in daily physical activity
22	Children involved in daily physical activity
23	Restriction of children's sedentary activities
24	Restriction of children's sedentary activity
HABITS	
Nutrition	
25	Fruit and vegetable consumption
26	Soft drink, candy and/or fried foods consumption
27	Health-related activities carried out by teachers in class
Physical activity	
28	Carries out physical activity
29	Avoids sedentary activities
30	Health-related activities carried out by teachers in class