



Evaluating a social marketing campaign on healthy nutrition and lifestyle among primary-school children: A mixed-method research design

Costanza Nosi^{a,*}, Antonella D'Agostino^b, Carlo Alberto Pratesi^c, Camilla Barbarossa^d

^a Department of Human Studies, LUMSA University, Piazza delle Vaschette, 101, 00193, Rome, Italy

^b Department of Statistics and Mathematics for Economic Research, Parthenope University of Naples, Via Medina 40, 80133, Naples, Italy

^c Department of Management Sciences, Roma Tre University, Via Silvio D'Amico, 77, 00145, Rome, Italy

^d Department of Marketing and International Business, Toulouse Business School, 1 Place Alphonse Jourdain - CS 66810, 31068, Toulouse Cedex 7, France

ARTICLE INFO

Keywords:

Social marketing education campaign
Children's nutrition and lifestyle
Mixed-method research approach
Italy

ABSTRACT

Italy has one of the highest levels of childhood overweight and obesity in Europe. Therefore, preventing children from becoming overweight is a major public health challenge. Here, we used a mixed-method research approach – including a quasi-experimental design and three surveys – to create a formative evaluation of a social marketing campaign on healthy nutrition and lifestyle in Italian primary school children. The social marketing campaign was organized around the 4 Ps of the marketing mix (*product*: the educational activities; *place*: the involved schools and supermarkets; *promotion*: the in-person and technology-based communication; and *price*: hours spent by the targeted children in fulfilling the educational activities). The campaign involved primary-school children across four Italian cities. The findings suggest that social marketing education campaigns can be effective tools to improve children's knowledge about healthy food and lifestyle, reduce their sedentary behavior, and increase their consumption of healthy food. Also, increasing children's acceptance of healthful nourishment is a valuable tool to improve the dietary habits of the entire family. With relation to the educational program assessment method, this study can inform societal interventions especially those involving children through the integration of different qualitative and quantitative research methods, which collect data from different subjects and perspectives.

1. Introduction

According to the World Health Organization (2018a), more than 340 million children and adolescents aged 5–19 are overweight or obese globally. The prevalence of overweight children is higher in high-income countries (Nishida, Borghi, Branca, & de Onis, 2017) including countries best known for their healthy eating habits and lifestyle such as Spain, Greece, and Italy (Fortuna, 2019). Epidemiological studies have detected lower morbidity and higher longevity in Mediterranean countries versus Northern Europe and the USA. Since the early 1960s, these health advantages have been largely attributed to the dietary patterns (the so-called Mediterranean diet) (Buckland, Bach, & Serra-Majem, 2008). However, most recent data released by the World Health Organization (2018b) show a completely reversed situation whereby childhood obesity and overweight rates in these countries are the highest in Europe due to decreasing adherence to the Mediterranean

diet and the reduction of physical movement (Labayen Goñi et al., 2018). According to the Childhood Obesity Surveillance Initiative of the European Region (World Health Organization, 2018b), Italy is among the countries with the highest levels of childhood overweight and obesity: approximately 40 % (38 % of the girls and 42 % of the boys) of Italian children aged 6–9 years are overweight. Therefore, excess weight during childhood is one of the greatest public health challenges.

2. Background literature

Excess weight in children is due to unhealthy lifestyles including poor nutrition habits and sedentary behavior (Istituto Superiore di Sanità, 2017). Therefore, although severe overweight is recognized as a critical health-related issue, it is also largely preventable through changes in lifestyle especially by promoting a healthy diet and physical activity.

* Corresponding author.

E-mail addresses: c.nosi@lumsa.it (C. Nosi), dagostino@uniparthenope.it (A. D'Agostino), carloalberto.pratesi@uniroma3.it (C.A. Pratesi), c.barbarossa@tbs-education.fr (C. Barbarossa).

<https://doi.org/10.1016/j.evalprogplan.2021.101965>

Received 22 July 2020; Received in revised form 14 April 2021; Accepted 8 May 2021

Available online 1 June 2021

0149-7189/© 2021 Elsevier Ltd. All rights reserved.

The number of interventions aimed at preventing childhood obesity has grown considerably in the past years (e.g., Dave, Liu, Chen, Thompson, & Cullen, 2018; Pineda, Swinburn, & Sassi, 2019; Wang et al., 2015). Some interventions used nudges, i.e., interventions where the food environment is altered in a way that changes pupils' choice architecture and leads to unconscious healthy behavior. While nudge-based interventions may be a critical tool to improve children's immediate dietary behaviors (Lycett et al., 2017), their sustained effectiveness in the long-term remains unclear because these interventions do not increase conscious behavioral changes (Bucher et al., 2016). Conversely, other interventions such as educational ones have emerged to be as more effective tools to promote children's conscious and sustained healthy behavior changes because they increase children's awareness, knowledge, engagement, and skills. Educational interventions may vary based on several factors: the recipients of the intervention activities (e.g., children, adults), the setting of intervention (e.g., primary care/health clinic, school, home, community), the age of the children involved, the length of intervention, the delivery approach (e.g., in-person delivery, technology-based delivery), the evaluation design, the behavioral domain targeted (e.g., diet, physical activity, media use, sleep), the funding sources (e.g., federal, foundation, corporate, university), and the approach used as a theoretical frame of reference (Ash, Agaronov, Aftosmes-Tobio, & Davison, 2017).

As to the recipients and the settings, it is worth noting that multi-recipients and multiple-setting interventions are among the most effective ones. Here, parents and teachers are integral targets along with children given their highly influential role in supporting and managing the behaviors that affect children's energy balance (e.g., diet, physical activity). Previous research has shown that the involvement of children's parents and teachers in lifestyle education programs significantly increases pupils' dietary intentions, preferences, knowledge, and dietary self-efficacy, and it also reduces their sedentary behavior (Nishida et al., 2017; Zacañas, Shamah-levy, Elton-puente, Garbus, & García, 2019). Similarly, previous research findings have revealed that multi-setting educational interventions (e.g., interventions set simultaneously in different contexts) may lead to the best results because they stimulate learning (so-called *food literacy*), provide skills and competences, and increase child engagement (Dave et al., 2018) while also providing knowledge.

Multiple delivery approaches including different learning techniques (e.g., observation and practice, storytelling, cooperative learning, and role playing) and diverse materials have consistently been shown to be more effective than conventional teaching only (Hawkes et al., 2015; Nishida et al., 2017; Zacañas et al., 2019). Finally, as to the approach used as a theoretical framework, this study focused on social marketing campaigns. Social marketing campaigns are initiatives that see corporations and foundations committed to designing and realizing programs aimed at improving children's nutrition habits and lifestyle. They use the principles and processes of commercial marketing (e.g., the 4 Ps of the marketing mix – *product, price, place, and promotion*) but not with the aim of selling products and services. Rather, the goal is to build positive relationships with the audience to increase the value of promoted behaviors and to encourage exchange in the form of behavior adoption (Barrington et al., 2016; Evans, Christoffel, Necheles, & Becker, 2010; Lee & Kotler, 2011). Empirical evidence strongly supports the effectiveness of social marketing campaigns in improving pupils' eating habits and lifestyles (Aceves-Martins et al., 2016).

Here, we used a mixed-method type of research including a quasi-experimental design and three sample surveys (Creswell & Plano Clark, 2011; Yim, Fellows, & Coward, 2020). This strategy was employed to make a formative evaluation of the social marketing campaign. Quasi-experimental designs are useful for evaluating initiatives in real-world settings where a random allocation of interventions may not be possible and/or intervention exposure is not under the control of investigators (Handley, Lyles, McCulloch, & Cattamanchi, 2018). The literature shows that evaluation outcomes of experimental

studies may be strengthened by supplementary collection of further data (Bloch et al., 2014). The combination of qualitative and quantitative research approaches such as the use of qualitative and quantitative viewpoints as well as the adoption of different data collection methods may increase the breadth and depth of understanding the investigated phenomenon and corroborate the research outcomes (Bazeley, 2018; Johnson, Onwuegbuzie et al., 2007 Johnson, Onwuegbuzie, & Turner, 2007).

Accordingly, this study contributes to the literature on interventions applied in the field of health education (e.g., Blitstein et al., 2016; Carins & Rundle-Thiele, 2014; Zacañas et al., 2019) by corroborating the assumption that social marketing campaigns can improve nutritional knowledge and encourage the adoption of healthier nutrition and lifestyle behaviors on the part of children (Tiganas, Boghean, & Vázquez, 2019). The study also aims to prove the usefulness of mixed method researches (Creswell & Plano Clark, 2011) including the investigation of multiple individual perspectives (Yim et al., 2020) in evaluating societal interventions such as those aimed at educating primary-school children. This study used multi-recipients (children, parents, teachers), multi-settings (school, supermarkets), and multi-supports (in-person and technology-based delivery) in a social marketing campaign. The study objectives, activities, and results are presented below.

3. The ViviSmart campaign

The ViviSmart campaign was financed, developed, and organized by three cooperating companies of the food and retail industries (Barilla, Coop Italia and Danone) as well and their respective foundations (Fondazione Barilla Center for Food & Nutrition, Associazione Nazionale Cooperative Consumatori – ANCC-COOP and Fondazione Istituto Danone) with the supervision of the SIMG - Società Italiana di Medicina Generale. The campaign was run in four cities and involved 16 primary schools and 70 classes for 1,505 second-, third- and fourth-grade children. The initiative was conceived as a pilot experiment wherein the three foundations contributed by providing their competences in the scientific and pedagogical fields, and the three business organizations made their strategic, marketing, and managerial competences available.¹ As summarized in Fig. 1, the campaign marketing mix included the product (educational activities and materials), the place (involved schools and supermarkets), and the promotion (mainly achieved in supermarkets, through the institutional website and a dedicated smartphone app, as well as through public relations made by the top management of the companies and their foundations). Similar to previous studies (Tiganas et al., 2019), the price was quantified in the hours that targeted children completed to fulfill the education activities accounting for 31,605 h. This number was obtained by multiplying the number of children involved in the campaign (1,505) times the number of education meetings during the campaign (7), times the length (in hours) of each meeting (3).

The intervention included multiple activities involving children and their teachers in the school setting as well as children and their parents in initiatives carried out in-store and online through a dedicated website and an app. Schools taking part in the campaign were chosen among those located in the neighborhood of the supermarkets (owned by Coop Italia) where the campaign-related activities took place. Before the beginning of the campaign, a press conference to launch the initiative was organized in each city where the campaign took place.

With relation to the school-based activities, the program consisted of seven meetings that took place approximately once a month (six classroom-based meetings and one in a retail outlet where children

¹ The supervision of the Italian Society of Pediatrics, in addition to the approval of the LUMSA University Ethics Committee of the campaign and the research ensured that no other interests besides the children's wellbeing and nutrition and lifestyle improvement were pursued through the initiative.

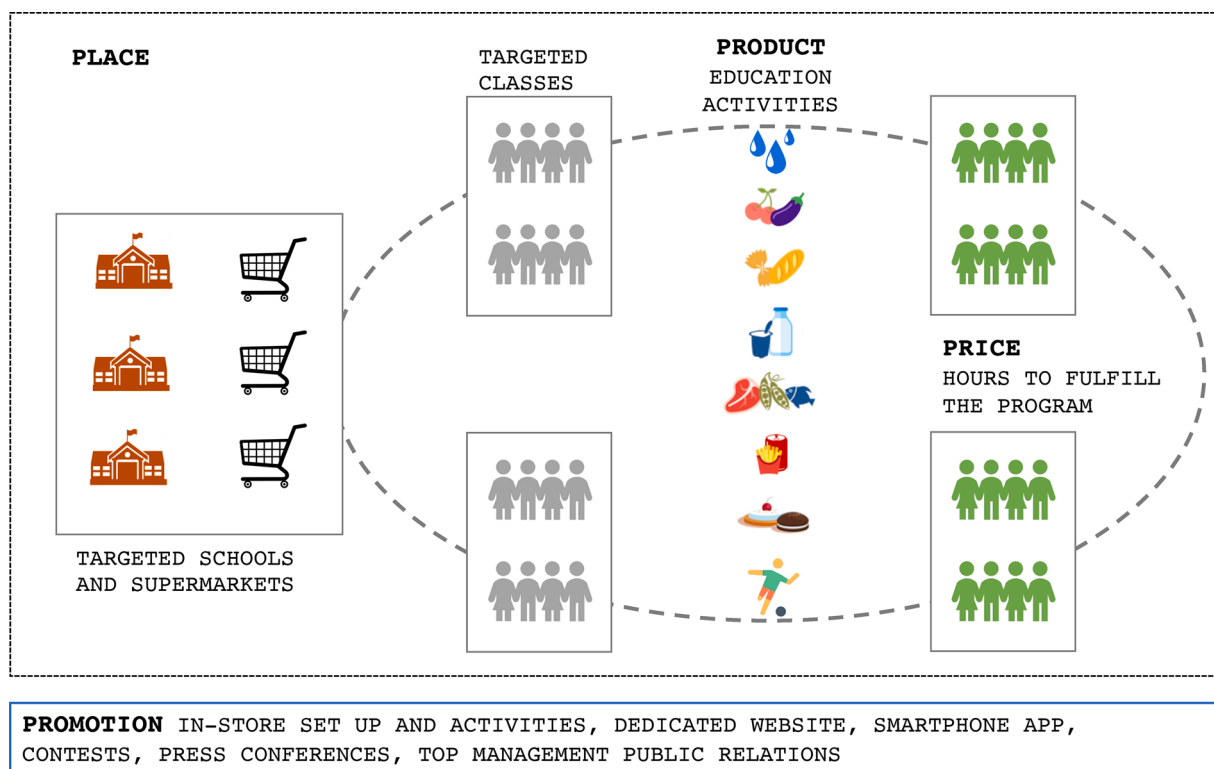


Fig. 1. Campaign marketing mix.

simulated a shopping experience) over an eight-month period from 2017–2018. Activities were carried out by ad hoc trained tutors with the cooperation of teachers. The pedagogical activities were based on the concept of the “body as a system” including a physiological, psychological, and cultural dimensions (Seclì, 2017). Nutrition and movement recommendations were based on the Transcultural Food Pyramid for the Pediatric Age (Italian Society of Pediatrics, 2017). Each meeting during the campaign focused on a specific theme and included theoretical teaching, experiential learning techniques, group works, games, laboratories, experiments, and role playing. The topic of each meeting, the description of the activities, and the pursued learning objectives are reported in Table 1. Every class was given a kit containing tools and materials to support the activities. There was also a guide for the teacher explaining the pedagogical methods used in the campaign and suggestions for further study.

During the entire campaign, tutors took pictures of in-class activities and children’s handiworks, drawings, Petecas, set tables, etc. and uploaded them on the dedicated website where they could be viewed by the scholars’ family members and friends and used by teachers for further education.

Supermarkets were used as vehicles for spreading information and organizing promotional activities; here, campaign-related posters, roll-ups, and floor graphics were displayed, and brochures and information were handed out by trained stewards and hostesses. Following the school-based campaign, the website and the app were populated with contents related to the topics treated in the classes. People could gather health- and lifestyle-related information and could upload pictures and take part in prize-giving contests by signing in the website or downloading the app.

4. Design and methods

4.1. Study design

The study builds on a mixed-method research design since different

qualitative and quantitative investigation methods were employed and combined. We implemented a quasi-experimental design—a non-equivalent group design where the researcher chooses existing groups that appear similar but where only one of the groups experiences the treatment. This approach involved children. There were three different surveys that involved teachers, tutors, and parents. The quasi-experimental design was used to test the hypothesis that the ViviSmart educational campaign had a positive impact on nutrition- and lifestyle-related behavior as well as the knowledge of the children taking part in the program. The evaluation compared pre-intervention and post-intervention measures of food consumption, physical activity screen-viewing habits (TV, computer, tablet, smartphone and videogame console), and objective knowledge about food and nutrition among scholars exposed to one of the following study conditions: (1) a treatment group that included scholars participating in the ViviSmart program; and (2) a no-treatment comparison group that included scholars who did not participate in the ViviSmart program. Based on this assumption, the ViviSmart program caused differences in outcomes between the treatment and the comparison group. Thus, we hypothesized that children who participated in the program would positively modify their food consumption behavior, increase their physical activity, reduce their time spent using screens, and increase their objective knowledge about food, nutrition, and physical activity.

To gather information to corroborate and better understand the quasi-experiment results, three different surveys were performed among the program tutors ($n = 15$), the teachers ($n = 52$), and a purposive sample of children’s parents ($n = 201$) at the end of the campaign. We used an online questionnaire including only open-ended questions to ask tutors to report on the perceived strengths and weaknesses of the education program, positive and negative aspects of in-class activities, possible suggestions for improvement, as well as pupils’ involvement in and enjoyment of the campaign. The online questionnaire for teachers included both closed- and open-ended questions investigating their perceptions of the pedagogical usefulness of the campaign and the changes noticed in children’s behavior. An intercept survey was

Table 1
Topics, descriptions of activities, and learning objectives for the program meetings.

Topics	Description	Learning objectives
1) The journey of food through the body	<ul style="list-style-type: none"> ■ Brainstorming with children about what happens to food once it is swallowed ■ Explanation of the digestive system ■ Experiment: recognition and digestion of starches 	<ul style="list-style-type: none"> ■ Understand that the body is a complex system ■ Understand the digestion process
2) Water	<ul style="list-style-type: none"> ■ Brainstorming with children about water ■ Explanation of the need of water for staying healthy and its function in our body ■ Experiment: Archimedes' principle and absorption process of a liquid ■ Game: true or false (objective knowledge questions) 	<ul style="list-style-type: none"> ■ Comprehend the importance of water ■ Understand that people need to drink a lot of water to be in good health
3) Fruits and vegetables (FV)	<ul style="list-style-type: none"> ■ Brainstorming with children about FV ■ Explanation about the water content in FV; the concepts of biodiversity and seasonality ■ Explanation of servings ■ Laboratory: the sensorial characteristics of FV ■ Experiment: the centrifugation process ■ Game: true or false 	<ul style="list-style-type: none"> ■ Understand that there are multiple different FV ■ Understand that seasonality is important ■ Understand that our body also absorbs water from FV ■ Comprehend the concept of servings
4) The food pyramid	<ul style="list-style-type: none"> ■ Explanation of the food pyramid and the Mediterranean diet ■ Explanation of nutrition recommendations ■ Game: construction of a paper-made simplified food pyramid ■ Game: true or false 	<ul style="list-style-type: none"> ■ Comprehend that there are multiple different foods ■ Comprehend that some foods must be eaten more frequently and others more seldom ■ Understand the food pyramid structure and the conception behind it
5) From pyramid to plate	<ul style="list-style-type: none"> ■ Explanation of daily meals ■ Artistic laboratory: children who brought pictures, drawings and objects from their tables were divided into groups and invited to "design" a composite table ■ Game: true or false 	<ul style="list-style-type: none"> ■ Understand that the number and type of food intake of daily meals is relevant ■ Comprehend that food is not only nourishment but also colors, conviviality, culture, tradition, etc.
6) Physical activity	<ul style="list-style-type: none"> ■ Gaming motor activity laboratory: children constructed a Peteca* and played games ■ Explanation of relevance of physical activity and negative effects of too much screen viewing 	<ul style="list-style-type: none"> ■ Comprehend the negative effects of sedentary behaviors on health
7) Today, we'll teach you!	<ul style="list-style-type: none"> ■ Children and parents were invited to a food retail outlet ■ Children were divided into groups and each group was given a "message" sent by a kid who described her day (including lifestyle and activities) and asked for advice on what to eat for lunch ■ Children had to simulate the purchase of the appropriate food and collect it in the cart 	<ul style="list-style-type: none"> ■ Use the acquired knowledge to choose the appropriate food based on lifestyle ■ Comprehend the responsibility of buying food

Table 1 (continued)

Topics	Description	Learning objectives
	<ul style="list-style-type: none"> ■ After the purchase, children explained their choices to teachers and their parents 	

* From indigenous origins, Peteca is a national sport in Brazil played with a hand shuttlecock. The name Peteca is given to the shuttlecock itself. During the laboratory, children first had to construct some Petecas using waste materials such as old socks, recycled paper, straw, etc., and then play games with them. Peteca is used in the pedagogical field based on the assumption that it can enhance both physical activity and fun. Participation in the game is claimed to contribute to children's physical, cognitive, social, and affective development (Secli, 2017).

conducted with parents on the last day of the campaign when children simulated the shopping experience. The questionnaire was self-administered and comprised structured questions on household food purchasing and consumption habits, perceived usefulness of the education program, and possible changes perceived in children's and/or family behavior during the campaign. A higher importance in addressing the program evaluation was given to the quasi-experimental design, and the other collected data were used to corroborate and better understand the results (priority decision) (Morgan, 1998) (Fig. 2).

4.2. The measures

The questionnaire used in the quasi-experiment was a modified version of the SPAN (School Physical Activity and Nutrition Project) questionnaire developed in Texas, USA as a surveillance instrument to measure physical activity, nutrition attitudes, and dietary and physical activity behaviors in children and adolescents (Thiagarajah et al., 2008). The questionnaire has been used and validated in numerous studies and different countries (e.g., Hardy, Mihrshahi, Drayton, & Bauman, 2016; Larsen, McArdle, Robertson, & Dunton, 2015; Öz, Metintas, Aydin, & Özay, 2016).

First, to ensure accuracy, the questionnaire was translated from English to Italian and then back-translated into English. Minor misunderstandings and unclear wordings were revealed by the back-translation and subsequently amended. The translated version of the questionnaire was shortened, revised, and adapted to include foods that are typical of the Italian diet and exclude those that are not. The final version of the questionnaire provided five sections: sociodemographic characteristics, food and beverage consumption, physical activity, screen-viewing behavior, and objective knowledge about food and nutrition. A section with questions measuring the liking of and satisfaction with the campaign was added in the post-intervention questionnaire submitted to children participating in the campaign.

Retaining the method adopted in the original form of the questionnaire, dietary behavior was assessed using the 24-h dietary recall (24hDR) method that consists of quantifying the intake of food and beverages consumed during the day before the questionnaire submission (Dave et al., 2018). To provide a couple of examples, the items read: "Yesterday, how many times did you eat fruit?"; "Yesterday, how many times did you eat vegetables?" The answer options were "none," "1 time," "2 times," and "3 or more times". In the elaboration phase, the original variables were recorded by merging the categories "2 times" and "3 or more times" and creating a new category labeled "2 or more times". Similar to the original form of the questionnaire, questions provided pictures of the investigated object/behavior to facilitate comprehension by children. Questions on physical movement asked about time (hours) spent screen-viewing and the number of days playing sport in the week before the questionnaire submission.

A paper-and-pencil self-administered method assisted by the tutors and the teacher/s of the classes was adopted as a survey method. The

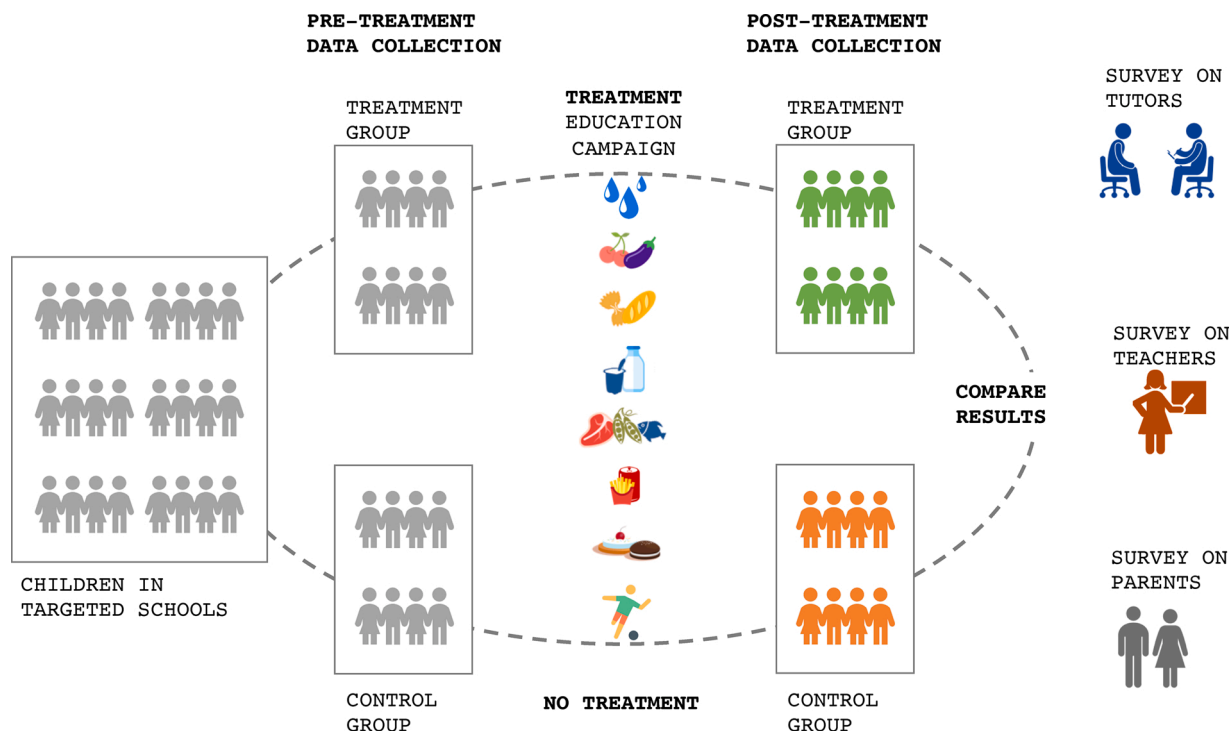


Fig. 2. Scheme of the mixed-method research design.

submission occurred in the usual classroom setting. To appropriately assist children during questionnaire completion, all tutors underwent a two-hour training session with one of the study researchers. A data anonymization procedure was adopted to preserve the privacy of responding pupils. The study was approved by the ethics committee of LUMSA (Libera Università Maria Santissima Assunta) University. Written informed consent was obtained from parents/caregivers for children to take part in the research.

4.3. Sampling and participants

This work used convenience sampling that is widely employed in the social sciences (Etikan, Musa, & Alkassim, 2016). Overall, thirteen schools in four different cities participated in the study. Cities were chosen to collect data on the different macro-regions of the country: two in northern Italy, one in central Italy, and one in southern Italy. In each school, only third- and fourth-grade classes were considered in our study for a total number of 47 classes.² The classes were randomly assigned to the intervention and control groups (in each school, only one class was assigned to the control group). Therefore, a total of 34 classes were part of the treatment group, and 13 classes were part of the control group. The final sample size equals to 863 children who answered both pre- and post-intervention questionnaire. Some descriptive statistics of the sample are shown in Table 2.

The validity of the comparison group was assessed ex-post at baseline (pretest) testing for no significant differences between the participants in the intervention and control groups on all relevant characteristics such as age, gender, and other factors associated with program exposure are reported in the Supplementary materials as well as some descriptive statistics concerning the responses related to the dietary behavior assessed with the 24-h dietary recall.

² Second-grade children were not included in the study because they were deemed too young to complete the SPAN questionnaire.

Table 2 Descriptive statistics (percentages).

	Control group	Treatment group	Overall
Sex			
Male	49.8	51.1	50.8
Female	50.2	48.9	49.2
Live with both parents			
Yes	90.6	87.2	88.2
No	9.4	12.8	11.8
Brothers/sisters (n)			
0	17.0	21.3	20.2
1	63.0	58.1	59.4
2 or more	20.0	20.5	20.4
Language spoken at home			
Italian	93.2	91.7	92.10
Other	6.8	8.3	7.90
Children (n)	235	628	863

4.4. Statistical methods

Data were analyzed using both Stata 14 (StataCorp, 2015) and R (R Core Team, 2020) software. First, the baseline and post-test data were merged resulting in two datasets (i.e., one dataset containing two rounds of data on children in the treatment group and the other dataset containing two rounds of data on children in the comparison group).

Nonparametric statistical hypothesis tests, namely, Wilcoxon matched-pairs signed-rank test (Howell, 2010; Wilcoxon, 1945) and McNemar’s χ^2 test for paired data (McNemar, 1947) were run to evaluate the differences between the two survey periods using data from a repeated-measures design in both the treatment and the control groups, separately. The null hypothesis states that there is no systematic or consistent difference between the two survey periods being compared. The alternative hypothesis states that there is an improvement in the children’s nutrition, lifestyle, and objective knowledge at time 1 with respect to baseline. Both tests were run considering schools as clustering variable using “clusrank” and “clust.bin.pair” packages of R software (Gopstein, 2016; Jiang, He, Lee, Rosner, & Yan, 2017).

5. Results

5.1. Results of the quasi-experimental design

With relation to the quasi-experimental design, the results of the Wilcoxon one-sided rank test and McNemar's χ^2 test for paired data are presented in Table 3 (variable coding is displayed in the Appendix A). The distribution of each measured indicator remains largely unchanged across baseline and post-intervention periods in the control group. Differences emerge in some indicators in the treatment group.

With respect to nutrition, significantly more children in the treatment group reported an increase in the consumption of water ($p = .010$), cereals ($p = .018$), and vegetables/fruits ($p < .005$) than in the comparison group. No statistically significant differences were reported in the consumption of these foods by children in the comparison group. Children of both groups reported a statistically significant decrease in sweet consumption. The differences between the two groups for other foods were not statistically significant.

Significantly more children in the treatment group than in the comparison group reported a reduction in time spent watching TV ($p = .041$), using a computer/laptop/tablet ($p = .089$) and playing video-games ($p = .054$), as well as an increase in time spent playing a sport ($p < .001$). No statistically significant differences were reported in time spent doing these activities by children in the comparison group.

While there were no statistically significant differences in nutrition- and lifestyle-related objective knowledge by children in the comparison group, significantly more children in the treatment group responded correctly to all four questions that were designed to assess knowledge. In particular, significantly more children in the treatment group provided appropriate answers regarding the number of fruit and vegetable servings that should be eaten daily ($p = .017$), the physical activity that

Table 3

Time 1 vs. Time 0 (baseline): summary of Wilcoxon one-sided signed-rank test and McNemar's χ^2 test for paired data adjusted for school clustering.

Variables*	Treatment group	Control group
Nutrition	p-value	
Wilcoxon test		
MEAT	n.s.	n.s.
CURMEAT	n.s.	n.s.
CHEES	n.s.	n.s.
FISH	n.s.	n.s.
WATER	0.010	n.s.
MILK	n.s.	n.s.
YOGURT	n.s.	n.s.
CER	0.018	n.s.
BREAD	n.s.	n.s.
FRIES	n.s.	n.s.
VEG	0.004	n.s.
LEG	n.s.	n.s.
FRUIT	0.002	n.s.
SODAS	n.s.	n.s.
SWEETS	0.007	0.02
Screen viewing and physical activity		
Wilcoxon test		
TV	0.041	n.s.
PC	0.089	n.s.
VIDGAME	0.054	n.s.
SPORT	<.001	n.s.
Objective knowledge on nutrition and physical activity		
Wilcoxon test		
KNVEG	0.017	n.s.
KNSPORT	0.017	n.s.
McNemar's test		
KNMORE	<.001	n.s.
KNLESS	0.002	n.s.

* Variable description, name, and coding is shown in Appendix A.

should be done to stay healthy ($p = .017$), the foods that people should have the most ($p < .001$), and the fewest ($p < .005$) servings of each food type per day.

5.2. Results of the additional surveys on tutors, teachers and parents

Overall, these outcomes substantiate the notion that the education campaign was a positive initiative that could involve children and improve their nutrition- and lifestyle-related knowledge and habits.

Tutors and teachers stated that the most successful aspects are the campaign's pedagogical methods, provided materials, adopted experimental learning techniques (labs, experiments, and in-store shopping experience). The duration of the campaign also helped develop a trust-worthy relationship between tutors and scholars while also building capability to increase children's curiosity about food/new foods.

The weaknesses include excessive difficulties in some learning modules (too many notions, too broad themes treated during some meetings, namely modules 4 and 5) and the lack of parental involvement since the beginning of the campaign. Table 4 reports the averages and percentages of the quantitative answers provided by the teachers and the parents.

6. Discussion and concluding remarks

Overall, our results mostly confirm that multi-recipients and multi-setting social marketing interventions are effective method to increasing pupils' dietary preference and knowledge, while reducing their sedentary behavior (Nishida et al., 2017; Zacarias et al., 2019). Our

Table 4

Averages and percentages of quantitative answers of teachers and parents.

Investigated subjects	Items	Average/ Percentage
Teachers	The tutors succeeded in transmitting the program contents	4.5*
	Provided materials to effectively support the education activities	4.5*
	The adopted pedagogical method favored the scholars' learning	4.4*
	The tutors interacted effectively with the scholars	4.6*
	The campaign website was an effective support for the education program	3.6*
	The scholars' involvement in the program has been high/extremely high	92.3 %**
	The education activities provided opportunities for further study	88.5 %**
	I noticed an improvement in the children's nutrition/lifestyle habits	69.2 %**
	The campaign has been a very positive initiative	93.8 %**
	My child has learned multiple new things thanks to the campaign	87.7 %**
Parents	My child has been very happy to take part in the campaign	95.9 %**
	My child talked about nutrition and lifestyle at home during the campaign	83.3 %**
	During the campaign, my child has asked to buy healthier food and make more wholesome preparations	49.4 %**
	During the campaign, the entire family has improved their conventional eating habits	58.1 %**

* Answers provided based on a five-point Likert scale (where 1=totally disagree and 5=totally agree) measuring the level of agreement with the reported statements.

** Percentage of respondents indicating 4 or 5 on a five-point Likert scale (where 1=totally disagree and 5=totally agree) measuring the level of agreement with the reported statements.

findings corroborate extant empirical works about the effectiveness of social marketing campaigns on diverse outcomes (Barrington et al., 2016; Evans et al., 2010; Lee & Kotler, 2011). Also, important, our findings encourage public authorities to exploit the commitment, competences, and financial resources of private actors to face societal challenges that are deemed of crucial importance, such as improving children's nutrition- and lifestyle-related behavior.

Starting from the impact on knowledge of the education program, children's knowledge improved with relation to all the investigated items confirming the results of previous research (e.g., De Villiers et al., 2016; Draper et al., 2010; Hawkes et al., 2015; Keihner et al., 2011). Even if they sometimes do not affect overt behavior in the short-term, school-based interventions – especially when adopting multifaceted pedagogical approaches – are successful in increasing pupils' food literacy and awareness about appropriate eating habits and lifestyle.

Regarding children's nutrition, the campaign positively impacted the consumption of water, which is known to be important in limiting excess weight. Children also increased intake of fruit, vegetables, and cereals, and moderated intake of sweets. The program reduced all sedentary habits of children (time spent watching TV, playing videogames and using a computer/laptop/tablet) and increased the time they spent playing sports.

There is evidence that the social marketing campaign produced better results than the counterfactual, but we admit that it was effective only in some children's nutrition-related domains (e.g., Keihner et al., 2011; Presti, Cau, Oppo, & Moderato, 2015). A possible explanation could be the way in which the information was provided and the time devoted to the activities on specific topics. Water, fruit, vegetables, as well as physical activity were objects of monothematic education modules. Children could have been able to better understand these straightforward messages and could have benefited by spending more time participating in focused pedagogical activities. They were therefore more effectively impacted by some communication forms and showed greater retention of related concepts and guidance, leading to behavioral changes only in some of the intervention areas. Such an explanation is corroborated also by what claimed by the tutors and the teachers who pointed out the excessive difficulty of the campaign education modules that treated broader themes, namely the 4th and the 5th (Table 1). These results might suggest partially re-crafting the campaign and concentrating the program on a few topics to optimize the use of the resources available for the intervention. Such a strategy is compliant with previous school-based education campaigns that are focused only on fruits or vegetables (e.g., Keihner et al., 2011; Presti et al., 2015; Thompson, Bachman, Baranowski, & Cullen, 2007); fruit, vegetables, and low-fat milk (Blitstein et al., 2016); or snacks (Ciccone, Woodruff, Fryer, Campbell, & Cole, 2013).

Over 95 % of the children who took part in the education program said that they liked it a lot, and 92 % of them claimed they had been talking about the campaign while at home with relatives and friends (this was confirmed also by the interviewed parents). In addition to the improvement in the pupils' knowledge and behavior, a possible further benefit of the campaign is spreading of positive word of mouth (WOM) about correct nutrition and lifestyle behavior. WOM is a powerful means to influence the formation of people's opinions and behavior (Ismagilova, Slade, Rana, & Dwivedi, 2020); thus, audience impacted by the campaign may be even larger than the targeted one.

The usefulness of the campaign was also confirmed by the results of the survey performed among the teachers. According to their opinion, children first started bringing healthier snacks to school such as fruit and vegetables in the place of pre-packed snacks or sandwiches with cold cuts that are typically eaten in Italy during school (ANSA, 2016). This implies that the students were actually improving some of their eating habits. The parents' answers suggest that the children themselves asked for more wholesome preparations while at home because the children do not prepare their own snacks. Second, the teachers noticed that the children were more curious about nutrition and more willing to try new

foods when they ate at the school canteen. This outcome suggests that the campaign may also have succeeded in overcoming the so-called food neophobia in children, i.e., unwillingness or reluctance to eat unfamiliar food (Maiz & Balluerka, 2018). The exposure of novel foods during the campaign may have increased children's acceptance of food and positively influenced their food preferences. The campaign may hopefully impact lifelong healthful nutrition habits in the children who took part in the program because preferences and dietary behaviors are claimed to track from early age to adulthood (Johnson, Bellows, Beckstrom, & Anderson, 2007; Johnson, Onwuegbuzie et al., 2007).

Finally, the data are relative to the fact that, during the campaign, the entire family improved their conventional eating habits, and children asked their parents to buy healthier food and make more wholesome preparations; this is particularly important. Children usually ask for and solicit parents about buying unhealthy food such as snacks or sweets—the so-called nag factor (Blitstein et al., 2016). In this case, however, it seems that the campaign led to a “counter-nag” effect wherein pupils asked their parents to purchase healthy food thus improving the dietary behavior of the whole family. Previous research (Cox & Poelman, 2015) showed that the people responsible for food purchases claim that they would buy healthy food more often if their children preferred them. This study suggests that increasing children's acceptance of healthful nourishment could be a valuable approach to impact the parents' intention to purchase healthier food thus improving the nutrition habits of all family members.

To corroborate the validity of the campaign and reaffirm that the sponsoring organizations were animated by a selfless spirit, it seems useful to pointing out the development that the campaign has undergone since its first edition. After replicating the program in the academic year 2018–2019 (the results are not presented in this paper), and far before the Covid-19 pandemic, the companies decided to digitize the produced materials, elaborate tutorials enabling the autonomous implementation of the educational program on the part of teachers and families and make everything freely downloadable from a dedicated website. In February 2021, the educational program was already been adopted by 280 classes of several primary schools in the country and the materials were downloaded by 270 families.

In terms of policy and practical implications, the positive outcomes of the campaign suggest that applying marketing principles and practices in domains where they are not conventionally used such as children's nutrition and lifestyle education may be an effective method to pursue societal changes. Accordingly, this initiative may at least partially reduce the possible concerns that introducing “marketing” into education will somehow trivialize the social role of educators and policy makers. This stands true also when big players operating in the food and retailing industries are the promoters of such initiatives. Instead of diminishing the credibility of the educational program, in fact, the names (and the well-known brands of the organizers) represented a strength of the project ending up increasing its reliability.

The present research also proves that trust-based partnerships between the public and the private sector can represent a valuable tool to promote innovative initiatives and efficient and sustainable programs also in delicate fields such as children's healthy eating. Alliances between business and non-business actors allow in fact the intermingling of different knowledge and competences, such as policy-related, scientific and pedagogical, but also strategic and marketing competences that may favor the success of collective projects thanks to the adoption of a managerial perspective. Finally, educational programs including multiple methods (role playing, group works, experiments, etc.) that enable gamification and that are set simultaneously in different contexts, such as school and retail environments, can be profitably exploited to enhance the adoption of positive behaviors also in fields other than pupils' eating and lifestyle, such as environmentally sustainable habits, diversity acceptance, inclusion, etc. that constitute relevant goals of modern societies.

6.1. Lessons learned

Applying marketing principles and practices in domains where they are not conventionally used such as children's nutrition and lifestyle education may be an effective method to pursue societal changes. The outcomes of this study showed that leveraging on different marketing mix components may enhance the involvement and engagement not only of children but also of the family thus positively reverberating throughout the habits of the entire household. The ViviSmart campaign could be a good practice and could be profitably realized in other countries where children's excess weight is a severe issue. It can also benefit Italian policy-makers, public institutions, and private companies in crafting and executing effective social marketing interventions. Furthermore, mixed-method research designs that combine quasi-experiments with the collection of data from multiple individuals using different approaches and methods can be profitably employed by both academics and practitioners to evaluate public interventions especially those involving children.

6.2. Limitations and suggestions for further research

The work does have some limitations suggesting caution in the interpretation of the results. First, this was a pilot initiative performed in four Italian cities and 16 primary schools. Both cities and schools were chosen based on a convenience sampling method. Despite their interest, the study results are not statistically significant, i.e., non-representative of the overall population of children attending the third and fourth grades of primary schools in Italy. However, this initial experience represents a first step in understanding the potential effectiveness of the ViviSmart educational program identifying possible critical aspects that can be improved. It also provides elements to assess the possible extension and replicability of the campaign in other schools and geographical areas both in Italy and abroad.

Children are not responsible for food purchases, and they have a limited influence on parents' food buying and consumption habits as well as on the physical activities that they can undertake. The outcomes are thus at least partially the result of decisions made by parents or caregivers. The campaign may have been effective in changing children's attitudes toward food and physical activity and increasing their willingness to adopt a healthy lifestyle, but this may not have translated into overt behavior during the campaign delivery period because they eat the foods that their parents decide to buy. Similarly, children play the sport activities that their family can afford and spend time screen-viewing according to their household habits. In turn, these factors may have influenced the campaign results. Therefore, in the design of future interventions, in addition to scholars, their entire family could be targeted and involved in the educational activities providing materials and tools able to engage all household members. As a matter of fact, such measure has been taken in this case by digitizing the program and making available specific resources for families as well.

With relation to the investigation method, future studies could apply

a research procedure that links the children's records with the interviewed parents. Thus, it could be possible to verify the existence of a possible relationship between the parents' characteristics (e.g., income, education level, ethnicity, etc.) and responses with the child's achievement after the campaign. Furthermore, some behavioral changes in children may not have occurred in the short run. In addition to the elements investigated in this study, future research could possibly investigate changes in attitudes and behavioral intentions of pupils. Thus, the effectiveness of the campaign could be measured using different indicators, i.e., some related to behavioral changes occurring in the short term and some that may not change in the short term but may be predictive of modifications in children's food consumption habits and lifestyle in the future. Finally, in addition to mainly quantitative investigation methods, qualitative methods such as in-depth interviews and focus groups involving children's parents, teachers, as well as tutors could provide useful information to improve the campaign design and contents.

Authors declaration statements

The research was funded by the companies and the foundations that realized the campaign (total financial contribution 13,000 € + VAT).

Whereas C. Nosi, A. D'Agostino and C. Barbarossa declare that they had no financial relationship with these organizations in the last 36 months, C.A. Pratesi declares that he has been working as a consultant on food sustainability-related topics for Barilla, Coop Italia, and Fondazione Barilla Center for Food and Nutrition.

With relation to the role of the sponsors, the authors declare that ANCC-COOP – Associazione Nazionale delle Cooperative di Consumatori Coop was involved in the data collection. Tutors providing the in-class educational activities contributed (with the teachers) to the submission of the questionnaire to children following a procedure of complete anonymization. Apart from this, the sponsors had no role in the research design; analysis and interpretation of the data; in the writing of the article; and in the decision to submit it for publication.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

We further confirm that any aspect of the work covered in this manuscript that has involved children has been conducted with the ethical approval of all relevant bodies, that is the Ethics Committee for Scientific Research (CERS - Comitato Etico per la Ricerca Scientifica) of LUMSA University – report no. 8 of Wednesday 8 November 2017 – and that such approval is acknowledged within the manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Variable description, name, and coding

Variable description	Variable name	Variable coding
Number of times the following food/beverages were eaten/drunk the day before the questionnaire submission	Nutrition	
Meat	MEAT	0 times = 1
Cured meat	CURMEAT	1 time = 2
Cheese	CHEES	
Fish	FISH	
Milk	MILK	2 or more times = 3
Yogurt	YOGURT	
Cereals (rice, couscous, pasta, etc.)	CER	

(continued on next page)

(continued)

Variable description	Variable name	Variable coding
Bread	BREAD	
French fries	FRIES	
Vegetables	VEG	
Legumes	LEG	
Fruit	FRUIT	
Sodas	SODAS	
Sweets	SWEETS	
Water	WATER	0 times = 1 At lunch and dinner = 2 Multiple times during the day = 3 I do not remember = 4
Hours spent screen viewing and times playing sports	Screen viewing and sport	
Watching TV (hr.) the day before questionnaire submission	TV	0 h = 1 Around 1 h = 2
Using computer/tablet (hr. per day usually spent when away from school)	PC	Around 2 h = 3
Playing videogames (hr. per day usually spent when away from school)	VIDGAME	Around 3 h or longer = 4
Days (n.) playing sport in the week before the questionnaire submission	SPORT	0 days = 1 1 day = 2 2 days = 3 3 days = 4 4 days = 5 5 days = 6 6 days = 7 7 days = 8
Nutrition/health-related questions	Objective knowledge on nutrition and lifestyle	
How many total servings of fruits and vegetables should you eat each day?	KNVEG	At least 2 = 1 At least 3 = 2 At least 4 = 3 At least 5 = 4 I don't know = 99
For staying healthy, we should do exercise, physical activity and sport. But what should we really do?	KNSPORT	Play sport every day = 1 Play sport 1–2 times a week = 2 Do 10–15 minutes of movement per day, even walking = 3 I don't know = 99
From which food group should you eat the most servings each day? Choose only one group	KNMORE	"Fruit and vegetables" or "legumes" = 1 "Fish" or "meat" or "milk and yogurt" or "cereals" or "cheese" or "sweets and snacks" or "I don't know" = 0
From which food group should you eat the fewest servings each day? Choose only one group	KNLESS	"Meat" or "sweets and snacks" = 1 "Fruit and vegetables" or "legumes" or fish" or "milk and yogurt" or "cereals" or "cheese" or "I don't know" = 0

Appendix B. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.evalprogplan.2021.101965>.

References

- Aceves-Martins, M., Llauradó, E., Tarro, L., Moreno-García, C. F., Escobar, T. G. T., Solà, R., & Giralt, M. (2016). Effectiveness of social marketing strategies to reduce youth obesity in European school-based interventions: A systematic review and meta-analysis. *Nutrition Reviews*, 74(5), 337–351.
- ANSA. (2016). *Altro che merendine, 8 bambini su 10 mangiano pane e salame*. Retrieved July 12, 2020, from https://www.ansa.it/canale_terraegusto/notizie/postit/Clai/2016/05/09/altro-che-merendine-8-bambini-su-10-mangiano-pane-e-salame_63806a10-3fe6-4f00-b9ac-92c37cf2acfa.html.
- Ash, T., Agaronov, A., Aftosmes-Tobio, A., & Davison, K. K. (2017). Family-based childhood obesity prevention interventions: A systematic review and quantitative content analysis. *The International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 113–125.
- Barrington, D. J., Sridharan, S., Saunders, S. G., Souter, R. T., Bartram, J., Shields, K. F., ... Hughes, R. K. (2016). Improving community health through marketing exchanges: A participatory action research study on water, sanitation, and hygiene in three Melanesian countries. *Social Science & Medicine*, 171, 84–93.
- Bazeley, P. (2018). *Integrating analyses in mixed methods research*. London, U.K: Sage.
- Blitstein, J. L., Cates, S. C., Hersey, J., Montgomery, D., Shelley, M., Hradek, C., ... Singh, A. (2016). Adding a social marketing campaign to a school-based nutrition education program improves children's dietary intake: A quasi-experimental study. *Journal of the Academy of Nutrition and Dietetics*, 116(8), 1285–1294.
- Bloch, C., Sørensen, M. P., Graversen, E. K., Schneider, J. W., Schmidt, E. K., Aagaard, K., & Mejlgaard, N. (2014). Developing a methodology to assess the impact of research grant funding: A mixed methods approach. *Evaluation and Program Planning*, 43, 105–117.
- Bucher, T., Collins, C., Rollo, M. E., McCaffrey, T. A., De Vlieger, N., Van Der Bend, D., ... Perez-Cueto, F. J. A. (2016). Nudging consumers towards healthier choices: A systematic review of positional influences on food choice. *The British Journal of Nutrition*, 115(12), 2252–2263.
- Buckland, G., Bach, A., & Serra-Majem, L. (2008). Obesity and the Mediterranean diet: A systematic review of observational and intervention studies. *Obesity Reviews*, 9(6), 582–593.
- Carins, J. E., & Rundle-Thiele, S. R. (2014). Eating for the better: A social marketing review (2000–2012). *Public Health Nutrition*, 17(7), 1628–1639.
- Ciccone, J., Woodruff, S. J., Fryer, K., Campbell, T., & Cole, M. (2013). Associations among evening snacking, screen time, weight status, and overall diet quality in young adolescents. *Applied Physiology Nutrition and Metabolism*, 38(7), 789–794.
- Cox, D. N., & Poelman, A. A. M. (2015). Towards greater vegetable consumption: Change the product or change the person? Case studies of two vegetable commodities. *Food Research International*, 69, 348–356.
- Creswell, J., & Plano Clark, V. (2011). Choosing a mixed methods design. In J. W. Creswell, & V. L. Plano Clark (Eds.), *Designing and conducting mixed methods research* (2nd ed., pp. 53–106). Los Angeles: SAGE Publications.
- Dave, J. M., Liu, Y., Chen, T., Thompson, D. I., & Cullen, K. W. (2018). Does the Kids Café Program's nutrition education improve children's dietary intake? A pilot evaluation study. *Journal of Nutrition Education and Behavior*, 50(3), 275–282.
- De Villiers, A., Steyn, N. P., Draper, C. E., Hill, J., Gwebushe, N., Lambert, E. V., & Lombard, C. (2016). Primary school children's nutrition knowledge, self-efficacy, and behavior, after a three-year healthy lifestyle intervention (HealthKick). *Ethnicity & Disease*, 26(2), 171–180.
- Draper, C. E., De Villiers, A., Lambert, E. V., Fourie, J., Hill, J., Dalais, L., & Steyn, N. P. (2010). HealthKick: A nutrition and physical activity intervention for primary schools in low-income settings. *BMC Public Health*, 10(1), 398.

- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4.
- Evans, W. D., Christoffel, K. K., Necheles, J. W., & Becker, A. B. (2010). Social marketing as a childhood obesity prevention strategy. *Obesity*, 18(n1s), S23–S26.
- Fortuna, G. (2019). *Childhood obesity is a plague on Southern Europe, new WHO report finds*. Retrieved July 1, 2020, from <https://www.euractiv.com/section/agriculture-food/news/childhood-obesity-is-a-plague-on-southern-europe-new-who-report-finds/>.
- Gopstein, D. (2016). *Clust. bin. pair: Statistical methods for analyzing clustered matched pair data*.
- Handley, M. A., Lyles, C. R., McCulloch, C., & Cattamanchi, A. (2018). Selecting and improving quasi-experimental designs in effectiveness and implementation research. *Annual Review of Public Health*, 39, 5–25.
- Hardy, L. L., Mihrshahi, S., Drayton, B. A., & Bauman, A. (2016). *NSW school physical activity and nutrition survey (SPANS) 2015: Full report*. Sydney.
- Hawkes, C., Smith, T. G., Jewell, J., Wardle, J., Hammond, R. A., Friel, S., & Kain, J. (2015). Smart food policies for obesity prevention. *Lancet*, 385(9985), 2410–2421.
- Howell, D. C. (2010). *Statistical methods for psychology* (7th ed.). Belmont, CA: Wadsworth, Cengage Learning.
- Ismailova, E., Slade, E., Rana, N. P., & Dwivedi, Y. K. (2020). The effect of characteristics of source credibility on consumer behaviour: A meta-analysis. *Journal of Retailing and Consumer Services*, 53, Article 101736.
- Istituto Superiore di Sanità. (2017). *Sovrappeso e obesità infantile, i dati del Sistema di Sorveglianza OKkio alla Salute*. Retrieved September 27, 2018, from http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dal ministero&id=2929.
- Italian Society of Pediatrics. (2017). *“Il cibo unisce”: ecco la Piramide Alimentare Transculturale - SIP*. Retrieved January 7, 2019, from <https://www.sip.it/2017/09/25/il-cibo-unisce-ecco-la-piramide-alimentare-transculturale/>.
- Jiang, Y., He, X., Lee, M. L. T., Rosner, B., & Yan, J. (2017). *Wilcoxon rank-based tests for clustered data with r package clusrank*. arXiv preprint arXiv, 1706.03409.
- Johnson, S. L., Bellows, L., Beckstrom, L., & Anderson, J. (2007). Evaluation of a social marketing campaign targeting preschool children. *American Journal of Health Behaviour*, 31(1), 44–55.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112–133.
- Keihner, A. J., Meigs, R., Sugerman, S., Backman, D., Garbolino, T., & Mitchell, P. (2011). The Power Play! Campaign's school idea & resource kits improve determinants of fruit and vegetable intake and physical activity among fourth- and fifth-grade children. *Journal of Nutrition Education and Behavior*, 43(4), S122–S129.
- Labayen Goni, I., Arenaza, L., Medrano, M., García, N., Cadenas-Sanchez, C., & Ortega, F. B. (2018). Associations between the adherence to the Mediterranean diet and cardiorespiratory fitness with total and central obesity in preschool children: The PREFIT project. *European Journal of Nutrition*, 57(8), 2975–2983.
- Larsen, A. L., McArdle, J. J., Robertson, T., & Dunton, G. (2015). Four dietary subscales of the SPAN questionnaire form a robust latent variable measuring healthy eating patterns. *Journal of Nutrition Education and Behavior*, 47(3), 253–258.
- Lee, N. R., & Kotler, P. (2011). *Social marketing: Influencing behaviors for good*. SAGE Publications Inc.
- Lycett, K., Miller, A., Knox, A., Dunn, S., Kerr, J. A., Sung, V., & Wake, M. (2017). “Nudge” interventions for improving children’s dietary behaviors in the home: A systematic review. *Obesity Medicine*, 7, 21–33.
- Maiz, E., & Balluerka, N. (2018). Trait anxiety and self-concept among children and adolescents with food neophobia. *Food Research International*, 105, 1054–1059.
- McNemar, Q. (1947). Note on the sampling error of the difference between correlated proportions or percentages. *Psychometrika*, 12(2), 153–157.
- Morgan, D. L. (1998). Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative Health Research*, 8(3), 362–376.
- Nishida, C., Borghi, E., Branca, F., & de Onis, M. (2017). Global trends in overweight and obesity. In I. Romieu, L. Dossus, & W. C. Willett (Eds.), *IARC working group report 10: Energy balance and obesity* (pp. 1–8). Lyon Cedex, France: International Agency for Research on Cancer.
- Öz, F., Metintas, S., Aydın, R., & Özyay. (2016). Turkish version of the SPAN questionnaire for highschool students: Reproducibility and validity. *Eastern Mediterranean Health Journal*, 22(10), 735–741.
- Pineda, E., Swinburn, B., & Sassi, F. (2019). Effective school food environment interventions for the prevention of childhood obesity: Systematic review and meta-analysis. *Lancet*, 394, S77.
- Presti, G., Cau, S., Oppo, A., & Moderato, P. (2015). Increased classroom consumption of home-provided fruits and vegetables for normal and overweight children: Results of the food dudes program in Italy. *Journal of Nutrition Education and Behavior*, 47(4), Article 338-344.e1.
- R Core Team. (2020). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.
- Secli, P. (Ed.). (2017). *Igiene Visiva: prevenzione possibile. Teorie e tecniche per il miglioramento del benessere psicofisico e dell'efficienza Visiva*. Lecce, Italy: Comunicazione Sanitaria.
- StataCorp. (2015). *Stata statistical software: Release 14*. College Station, TX: StataCorp LP.
- Thiagarajah, K., Fly, A. D., Hoelscher, D. M., Bai, Y., Lo, K., Leone, A., & Shertzer, J. A. (2008). Validating the food behavior questions from the elementary school SPAN questionnaire. *Journal of Nutrition Education and Behavior*, 40(5), 305–310.
- Thompson, V. J., Bachman, C. M., Baranowski, T., & Cullen, K. W. (2007). Self-efficacy and norm measures for lunch fruit and vegetable consumption are reliable and valid among fifth grade students. *Journal of Nutrition Education and Behavior*, 39(1), 2–7.
- Tiganas, A., Boghean, A., & Vázquez, J. L. (2019). Behavior change and nutrition education for teenagers: Nestlé social marketing “Healthy Kids Programme” in India. In D. Z. Basil, G. Diaz-Meneses, & M. D. Basil (Eds.), *Social marketing in action: Cases from around the world* (pp. 271–282). Cham: Springer International Publishing.
- Wang, Y., Cai, L., Wu, Y., Wilson, R. F., Weston, C., Fawole, O., ... Segal, J. (2015). What childhood obesity prevention programmes work? A systematic review and meta-analysis. *Obesity Reviews*, 16(7), 547–565.
- Wilcoxon, F. (1945). Individual comparisons by ranking methods. *Biometrics Bulletin*, 1(6), 80–83.
- World Health Organization. (2018a). *Obesity and overweight*. Retrieved September 26, 2018, from <http://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>.
- World Health Organization. (2018b). *Childhood obesity surveillance initiative. Highlights 2015-17*. Retrieved July 21, 2020, from https://www.euro.who.int/_data/assets/pdf_file/0006/372426/WH14_COSI_factsheets_v2.pdf?ua=1.
- Yim, M., Fellows, M., & Coward, C. (2020). Mixed-methods library evaluation integrating the patron, library, and external perspectives: The case of Namibia regional libraries. *Evaluation and Program Planning*, 79, Article 101782.
- Zacarias, G., Shamah-levy, T., Elton-puente, E., Garbus, P., & García, O. P. (2019). Development of an intervention program to prevent childhood obesity targeted to Mexican mothers of school-aged children using intervention mapping and social cognitive theory. *Evaluation and Program Planning*, 74, 27–37.

Costanza Nosi is Associate Professor of Management and Marketing at LUMSA University of Rome, Italy. She is the Rector’s Delegate for the University third mission and the University referent for job guidance and job placement. Her main research interests are entrepreneurship and consumer behavior with specific reference to the food and beverage sector.

Antonella D’Agostino, PhD in Applied Statistics, is Associate Professor of Economic Statistics at Parthenope University of Naples, Italy. Her main research interests are statistical methodologies for studying transition from education to work, education assessment, measures and models for studying living conditions with special reference to poverty and inequality analysis.

Carlo Alberto Pratesi is Professor of Marketing, Innovation and Sustainability at Roma Tre University, Rome, Italy. His main research interests are marketing, corporate communication, sustainability and entrepreneurship. He is advisor in the fields of marketing, innovation and sustainability for leading Italian companies and institutions.

Camilla Barbarossa, PhD in Business Administration and Management, is Associate Professor of Marketing at Toulouse Business School, Toulouse, France. Her main research interests are consumer behavior, ethical and pro-environmental consumption, quantitative methods and survey based experimental research.