

LETTER TO THE EDITOR

Nutritional Project in School Setting: Analysis of Food Choices following Actions performed by Healthcare Workers

Progetto di educazione nutrizionale nel contesto scolastico: analisi delle scelte alimentari a seguito di interventi attuati dagli operatori sanitari

Keywords: Primary school; children; nutrition; snack; health promotion; healthcare workers.

Abstract

Schools continue to represent one of the main settings that guarantee health promotion interventions, as it has been widely demonstrated in numerous fields that diet and eating habits are shaped in the early stages of life and maintained into adulthood. Through the food education promotion project, "Healthy Snack", implemented by the Prevention Department of the Local Health Authority ULSS 1 Dolomiti, the interventions carried out by healthcare workers have been evaluated over time to measure their effectiveness in terms of changes in eating habits considered incorrect, with a particular focus on snacks eaten at school.

Dear Editor:

unhealthy dietary patterns, characterized by the presence of highly processed and high-calorie foods, low consumption of fruit and vegetables and a sedentary lifestyle, lead to an increase in body weight, which is an important risk factor for the development of non-communicable diseases. Currently, overweight and obesity are a public health concern and are already present in the early stages of children's lives (1). Several European studies on the dietary patterns adopted by children and adolescents confirm a decline in the quality of their diets in recent decades due to the increase in consumption of refined foods, sweets and fast food, in addition to a decrease in consumption of foods such as legumes, fruit, vegetables and fish. Furthermore, it is widely known that obese school-age children tend to become obese adults (2). Recent studies continue to highlight the association between obesity and bad eating habits, especially regarding the consumption of junk food, with a particular focus on breakfast and the mid-morning snack; other studies highlight further problem related to the choice of snacks due to the high consumption of processed foods and the minimal intake of fresh foods such as fruit (3,4).

School itself, given the time spent there, represents an effective setting for the implementation of childhood obesity prevention programs. Furthermore, prevention programs can have a more beneficial effect on body mass index if implemented from an early age, in particular from 6 to 12 years; such programs should involve both the child and the parents, in addition to teachers as educators (5-7).

The Italian Ministry of Health promoted the development of the OKkio alla SALUTE surveillance system, which involves children aged 8 to 9 who attend the third class of primary school. From the results of the most recent survey, conducted in 2023, the status report of Italy highlights that overweight children represent 19% and obese children



represent 9.8% of the population, including children with severe obesity, who represent 2.6%. In particular, among those with unhealthy eating habits, 66.9% of children have a large mid-morning snack, a figure that has worsened compared to the previous survey (55.3%) (8). In the Veneto region, the data collected with OKkio alla SALUTE appear to be better than the national data: the values for excess weight are lower than the national average, with slightly lower values for overweight and obesity (17.3% overweight, 6.9% obesity) (9).

In the 2022-2023 school year, “Healthy Snack” project was conducted involving the primary schools located in the Province of Belluno, evaluating the changes in the choice of mid-morning snacks made at school, following the food education interventions implemented by the healthcare workers (HCWs) of the Health Promotion Service of the Prevention Department of ULSS 1 Dolomiti. During the investigation, a significant improvement in the children’s choice of healthy snacks was observed (p-value equal to 0.0001) (10).

Through a follow-up investigation conducted in the same territory, the eating habits adopted by children attending primary school in the 2023-2024 school year have been assessed: 34 classes joined the training program, making a total of 482 students. In the current survey, no overall improvement was observed in terms of healthy snacks, but it is worth highlighting that between February 2024 and April 2024 (intermediate project time frame), a nutritional laboratory was conducted in the classes by the HCWs, which appears to be correlated with an improvement in the choice of snacks brought to school by children.

The school environment may play an important role in health promotion with regard to nutrition (11-13). Therefore, if developed with the aim of ensuring lifelong health, nutritional interventions in schools could play a decisive role and contribute to the reversal of the alarming prevalence of overweight and obesity in children and consequently reduce the development of possible future cardiometabolic diseases. Furthermore, these interventions represent a valuable public health tool that can improve the psychosocial factors associated with children’s knowledge and attitudes to food and nutrition, particularly in mountainous regions that present sometimes challenging demographic and territorial extension characteristics. The effectiveness of such interventions should be monitored over time, as they are influenced by numerous variables, including the specific context, the target population and the many professionals involved.

Giuseppina Federici¹, Nicole Zulian², Erica Bino³, Vincenzo Marcotriggiano⁴, Alberto Lovat¹, Angela Padoin¹, Alessandro Citiulo², Giovanni Andrea Sava², Sandro Cinquetti⁴

¹Prevention of Non-communicable Diseases, Screening Programs and Health Promotion Service, Prevention Department, Local Health Authority “ULSS 1 Dolomiti”, Belluno, Italy

²Food Hygiene and Nutrition Service, Prevention Department, Local Health Authority “ULSS 1 Dolomiti”, Belluno, Italy

³Epidemiology Service, Prevention Department, Local Health Authority “ULSS 1 Dolomiti”, Belluno, Italy

⁴Prevention Department, Local Health Authority “ULSS 1 Dolomiti”, Belluno, Italy

References

1. Grosso G, Buso P, Mata A, Abdelkarim O, Aly M, Pinilla J, et al. Understanding consumer food choices & promotion of healthy and sustainable Mediterranean diet and lifestyle in children and adolescents through behavioural change actions: the DELICIOUS project. *Int J Food Sci Nutr*. 2024 Aug;**75**(5):527-535. doi: 10.1080/09637486.2024.2353065. Epub 2024 May 26. PMID: 38797529.
2. Costa CS, Del-Ponte B, Assunção MCF, Santos IS. Consumption of ultra-processed foods and body fat during childhood and adolescence: a systematic review. *Public Health Nutr*. 2018 Jan;**21**(1):148-159. doi: 10.1017/S1368980017001331. Epub 2017 Jul 5. PMID: 28676132; PMCID: PMC10260745.
3. González-Campins C, Soler LF, Guasch-Niubó O, San Onofre N, Aguilar Martínez A, Martínez-García A, et al. Nutritional Quality of the Mid-Afternoon Snack of Schooled Children between the Ages of 3 and 12 Years in Three Areas in Spain. *Nutrients*. 2024 Jun 19;**16**(12):1944. doi: 10.3390/nu16121944. doi: 10.3390/nu16121944. PMID: 38931302; PMCID: PMC11206826.
4. Lemke S, de Andrade DF, de Fragas Hinnig P, da Silva SA, Vincenzi SL, Roberto DMT, et al. Development and application of the Meal and Snack Assessment (MESA) quality scale for children and adolescents

- using item response theory. *Nutr J.* 2024 May 14;**23**(1):50. doi: 10.1186/s12937-024-00948-y. PMID: 38745270; PMCID: PMC11092231.
5. Cobal S, Bender DV, Kljusurić JG, Rumora Samarin I, Krznarić Ž. Effect of School-Based Educational Intervention on Childhood Obesity in Croatian Urban and Rural Settings. *Children (Basel).* 2024 Jul 17;**11**(7):867. doi: 10.3390/children11070867. PMID: 39062316; PMCID: PMC11276343.
 6. Lambrinou CP, Androutsos O, Karaglanı E, Cardon G, Huys N, Wikström K, et al. Feel4Diabetes-study group. Effective strategies for childhood obesity prevention via school based, family involved interventions: a critical review for the development of the Feel4Diabetes-study school based component. *BMC Endocr Disord.* 2020 May 6;**20**(Suppl 2):52. doi: 10.1186/s12902-020-0526-5. PMID: 32370795; PMCID: PMC7201517.
 7. Smith JD, Fu E, Kobayashi MA. Prevention and Management of Childhood Obesity and Its Psychological and Health Comorbidities. *Annu Rev Clin Psychol.* 2020 May 7;**16**:351-378. doi: 10.1146/annurev-clinpsy-100219-060201. Epub 2020 Feb 25. PMID: 32097572; PMCID: PMC7259820.
 8. Istituto Superiore di Sanità (ISS). OKkio alla SALUTE, indagine 2023. Available from: <https://www.epicentro.iss.it/okkioallasalute/indagine-2023> [Last accessed: 2024 Oct 28].
 9. ULSS 1 Dolomiti. OKkio alla SALUTE. Risultati dell'indagine 2023. Available from: <https://www.aulss1.veneto.it/wp-content/uploads/2019/01/OKkio-alla-Salute-Risultati-dellindagine-2023-ULSS-1-Dolomiti-2.pdf> [Last accessed: 2024 Oct 28].
 10. Federici G, Marcotrigiano V, Bino E, Lovat A, Padoin A, Salerno G, et al. Healthy Snack Project: Improving Healthy Choices through Multidisciplinary Food Education Actions. *Nutrients.* 2024 Jan 14;**16**(2):255. doi: 10.3390/nu16020255. PMID: 38257147; PMCID: PMC10818516.
 11. Marcotrigiano V, Stingi GD, Fregnan S, Magarelli P, Pasquale P, Russo S, et al. An Integrated Control Plan in Primary Schools: Results of a Field Investigation on Nutritional and Hygienic Features in the Apulia Region (Southern Italy). *Nutrients.* 2021 Aug 28;**13**(9):3006. doi: 10.3390/nu13093006. PMID: 34578882; PMCID: PMC8470469.
 12. Acito M, Cangelosi G, Petrelli F, Moretti M, Villarini M, Celestino A, et al. Eating and lifestyle habits and primary school health-related programs: a survey involving Italian children and teachers. *Ann Ig.* 2024 Mar-Apr;**36**(2):123-143. doi: 10.7416/ai.2024.2599. Epub 2024 Jan 18. PMID: 38236002.
 13. Marcotrigiano V, Stingi GD, Nugnes PT, Mancano S, Lagreca VM, Tarricone T, et al. Collective Catering Activities and Official Controls: Dietary Promotion, Sustainability and Future Perspectives. *Healthcare (Basel).* 2023 May 7;**11**(9):1347. doi: 10.3390/healthcare11091347. PMID: 37174889; PMCID: PMC10178468.

Corresponding Author: Vincenzo Marcotrigiano, Prevention Department, Local Health Authority "ULSS 1 Dolomiti", Viale Europa 22, 32100 Belluno, Italy
e-mail: vincenzo.marcotrigiano@aulss1.veneto.it