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## **EFFECT**

### ***Erasmus For Food Education to Children and Trainers***

***Erasmus+ Project number : 2021-1-FR01-KA220-SCH-000024289***

# **White book on the best practices in food education toward children**

**Project Results PR.1, Version: 1.0**

#### **PR1: White book on the best practices in food education toward children**

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**NOTES:**

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## Foreword

The work described in this report was developed under the project EFFECT: ERASMUS FOR FOOD EDUCATION TO CHILDREN AND TRAINERS (KA220-SCH - Cooperation partnerships in school education). If you wish any other information related to this report or the EFFECT project, please visit the project web-site ([https://www.effect-erasmus.eu/.](https://www.effect-erasmus.eu/)) or contact:

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## 1. **Purpose, objectives and expected impact of the project**

The aim of EFFECT project is to develop food education for children aged 6-10 years through the training of their trainers, and thus to develop among both children and trainers, key competences using innovative approaches such as the Sustainable Lifestyle Fest.

The main goals of the EFFECT project are:

- to propose a thorough analysis of best practices in food education toward children across Europe,
- to improve the trainers' awareness and knowledge on food education through dedicated pedagogical material and training sessions,
- to create and implement the Sustainable Lifestyle Fest in all participating countries,
- to develop food education for children at the European level through dissemination and transferability activities.

Overall, the expected project impacts are:

- an increase of the knowledge of best practices in food education towards children across Europe,
- an increase of pedagogical resources and tools available to support trainers in the development of food education sessions towards children,
- an increase of the children's knowledge regarding food products,
- a wider dissemination and uptake of the knowledge in EU educational communities via tailored content on an e-learning platform.

## 2. **Project Result 1 - White book on the best practices in food education towards children**

The EFFECT project will produce through PR1 a White Book on the best practices towards food education for children at the European level. This White Book will compile the results of tasks 1.1, 1.2 and 1.3: it will include elements from the analysis of needs and requirements for children's learning preferences, from the analysis on the best practices in food education towards children, and from the analysis of needs and requirements for trainers' learning and teaching preferences. The White Book will propose a state of the art of food education for children, and provide advice and ideas on the development of successful food education sessions towards children. This document will be made available on the e-learning platform, and will be disseminated notably in the networks of the academic partners in all Europe for wide transfer. This PR will target trainers, food education professionals and national education stakeholders. It will result in 4 tangible deliverables that will support the implementation of the other project's results: - State-of-the-art



report on analysis of needs and requirements for children learning preferences - State-of-the-art report on analysis of the best practices in food education towards children - State-of-the-art report on analysis of needs and requirements for trainers learning and teaching preferences -White Book on the best practices in food education towards children. The innovative aspect of this deliverable results from its concrete vision of food education for children at the European level, including the needs of the children, but also those of their trainers. The deliverable will propose a 360° vision of food education for children, taking into account all stakeholders.

## **2.1 Objectives**

The overall objective of this PR is the gathering of best practices in food education towards children and analysis of needs and requirements.

Additionally, this deliverable aims to:

- identify the needs and the requirements of children in relation to the contents and the characteristics of a food education program
- gather direct feedback from education professionals on the best practices in food education towards children
- identify the needs and the requirements of trainers involved in children' food education, to propose to them relevant pedagogical tools and working methodologies

## **2.2 Expected outcomes**

- Creation of a White Book, a state of the art of food education for children.
- Development of successful food education sessions towards children.





### **3. T1.1 Focus groups**

The first part of this project was qualitative research which was carried out to understand and analyze the needs of children in order to improve their health behaviors. Three focus groups were conducted in three countries: France, Spain and Greece. The informants were children carers in a general sense, such as teachers, trainers, researchers, project managers and canteen monitors.

#### **3.1 Objectives**

The objective of this project is to develop the education of children aged between 6 to 11 years old in good health behaviors through an analysis of the needs in the field of professional working with children, the collection of information and a confrontation of the points of view of different professionals. The project focuses on training and therefore the development of key competences in both children and trainers.

#### **3.2 Participants**

In France, this focus group took place in VIF's facilities (2 Dormagen Street, 59350, Lille, France) on March 2022 (duration: 1h30) and was supervised by members of the VIF® team. The focus group was composed of a multidisciplinary panel of six field experts working with children (one man and five women, aged 30-65 years old).

List of experts:

- A pediatrician
- A project manager for actions around health prevention
- A post-doctoral fellow working on physical activity in schools
- A project manager specializing in physical activity
- A manager of the children's department in a town of 55,000 inhabitants
- A coordinator of extracurricular activities

In Spain, this focus group took place in ComocomoSchool's facilities on May 2022 (duration: 1h30). It was facilitated by ComocomoSchool and FIAB. The focus group was also composed of a panel of 6 experts from 25 to 45 years old (one man and five women), working directly with children and knowing their needs:

- 4 teachers in a primary school
- 2 canteen monitors

One of them works with children with special needs.



In Greece, 3 focus groups took place in EKEDISY's facilities (17 Agia Filothei Street, 10556, Athens, Greece) on May 2022, 15 teachers/museum educators/trainers (fourteen women and one man) participated (mean duration: 50 min). Most of the respondents were teachers, aged 23–55 years old.

### 3.3 Introduction

The focus groups participants reported that education in healthy behaviors is a very important issue and that more work should be done in schools and childcare facilities. Children are excited on days when they eat less healthy options and do not prefer days when there are healthier choices like vegetables or fish. One participant indicated that the students are aware of the healthy behaviors, but they do not apply it in their daily life. So there is currently a gap since there is no guide, no program, no material in the school curriculum on healthy diet and lifestyle.

There is a real demand from the school sector to promote literacy about food and nutrition among children.

### 3.4 Main results

#### ▪ 3.4.1 A global approach

To be effective, it is important to combine theory and practice to transmit the key messages to the final target, the children. A practical and playful approach is needed to address the notion of healthy living behaviors. The topics to be covered are: diet, physical activity and well-being.

To achieve this, it is essential to use social marketing techniques by activating all possible levels.

The multiplicity of support techniques is a key element in the success of education programs for children. Indeed, «*no two children are the same*». In addition, addressing a topic in different ways increases the chances that the child will learn and adopt healthy behavior. For example, there is a need for multi-thematic programs that address the themes of nutrition and physical activity. This requires the use of concrete, educational and experiential tools that can take various forms: tasting workshops, quizzes, videos, printed materials, presentations within the school curriculum, photos, games.

The game is widely used and is considered the most effective technique by school catering staff. Another possibility is to implement theme weeks, which allows a topic to be addressed in a continuous way: "*Organize weeks dedicated to food categories and try everything by explaining the different flavors and beneficial properties of foods*".



The repetition of actions is also crucial, as it allows literacy to be anchored in the long term: *"Regular contact with parents...lots of training activities, information on physical activity and sedentary lifestyle, diet"*.

The need for a step-by-step support was highlighted. It is often wise to start with awareness-raising and then implement more concrete actions: animations or actions from A to Z, for example the implementation of a vegetable garden. This allows interaction between families and children, but also an intergenerational transmission of skills. For the actions to be successful, it is necessary to rely on the local environmental resources appropriate for child.

Field actions, real interactions, practical things "visual, concrete, manipulation" work very well. This is what our panel of experts is looking for to get the message across to children. To do this, you have to rely on the experiential learning: *"Sometimes children respond better to certain materials than to words you can tell them; stories, videos, posters, etc. The visual is always more appealing to them"*.

Going through experiences and having a teaching support to take home, allows children to better integrate nutrition messages and behaviors and transmit them to their families and friends.

Initiatives from A to Z, such as "from farm to fork", are long-term. In the case of food, the implementation of a vegetable garden in a school makes it possible to elaborate on the nutrition subject as continuum, from planting to consumption. Over the course of a school year, discussions regarding fruit and vegetables, how to plant them, how to harvest them, their seasonality and their nutritional qualities are important. Then, afterwards, they can elaborate on the raw product, make recipes before tasting it. Long-term projects of this kind require children's active involvement, through collective learning. The success of this initiative depends very much on the involvement of the person in charge (person-dependent success) and of the facility as a whole.

#### ▪ **3.4.2 Continuous learning**

For the sustainability of healthy behaviors, it is necessary to set a lifestyle for children to follow in their daily lives. In the school setting, this can be done through the provision of facilities, for example, by installing water fountains in schools. This promotes learning through empowering children to take responsibility for their hydration needs.



By having a physical object, such as a water bottle or cup that is associated with the use of a self-service water cooler, children are encouraged to drink water on a daily basis. The creation of an object that can be personalized by the children is an incentive for this consumption: *"The cup is personalized and stored in a specific place so that the child has access to it whenever he or she needs it"*.

It is therefore necessary to give children meaningful examples that illustrate their daily lifestyle, for example, mentioning snack time that takes place during school time: *"Everyday actions are more effective than exceptional events"*.

It is important to promote healthy habits in children, from a very early age. Learning also involves repetition of messages.

#### ▪ **3.4.3 An appropriate amount and frequency of information**

The frequency of actions should be regular and sufficient, without being too restrictive for the school and the children: *"Every week for a month is more acceptable in terms of organization than once a week for 5/6 months"*.

It is also important to *"dose the amount of messages"* that are conveyed so as not to *'drown children with information'*. It can be interesting to deal with several subjects/themes at the same time. Indeed, the experts in this focus group highlighted that combining two themes can have a positive effect on changing children's behavior. Beyond two topics, however, it may no longer be beneficial and have less impact on children, as the messages are too dense.

Children seem to be interested in the topics of nutrition, hydration, physical activity and sustainability. But some children seem to have difficulty in understanding why they should follow specific "dietary rules" and why they should eat different types of food in certain quantities and proportions. The message given to children should therefore be adapted to their level of understanding. There should also be time for questions and answers. *"Active participation allows for discussion and exchange of ideas"*.

### **3.5 One message, different targets**



### ▪ 3.5.1 Multiplying targets

Actions must be implemented at different levels: the family sphere, the child's ecological niche, i.e. school, extracurricular activities, the municipality, etc. The content and form of the messages are essential to help the acquisition of good habits and good health behavior. Messages are multi-targeted, addressing:

- children
- parents
- the children's supervisors: teachers, extracurricular activities, local actors, school catering actors (when there are any)
- the environment in which the child evolves: the town and the people who are an integral part of the child's ecological niche

*"A global mobilization [...] teachers-parents and municipality. I think that the municipality has a huge number of levers on physical activity".*

Indeed, local actors have a major role in educating children about good health behavior. They work in conjunction with populations and professionals, and are therefore a key link in the implementation of health policies, whether it be prevention or health promotion. *"Families and the community can support learning in the classroom and play an important role in food education, so that children can integrate this learning into their lives and maximize the educational benefits".*

In addition, one stakeholder indicated that if the family works with the children on healthy habits, this is visible at lunch time. The involvement of the family is crucial and makes the actions more effective. Training for parents could be a solution, or educational activities between parents and students.

### ▪ 3.5.2 A comprehensible message for children and their families

For messages targeting children, it is necessary to respect their learning pace and their ability to understand, for example, a message intended for first-year pupils is not the same as that for fifth-year pupils: *"The choice of the best foods, these are questions that I had with the children, so it was more with the 4<sup>th</sup> and 5<sup>th</sup> graders not so much with the younger ones. Because the youngest children remain very basic, the fruit and vegetable side, they don't look too far. But with the fourth and fifth graders, it's concepts that we can start to tackle, and they manage to understand it".*



Once children understand the value of the information/message conveyed, the concepts are more easily understood and integrated: *"Hydration helps with mental alertness, performance and sporting ability"*.

As a result, the message communicated to parents must be different from the one communicated to children. It should enable them to reinforce and complement the message received by children in the school setting.

Young children very often imitate their parents (peer imitation), so positive behavioral changes need to be adopted by the whole family. Parents are role models for children, they need to realize that they have a responsibility to their children, they need to set an example: *"Many children have developed bad eating habits at home. This is why working with the family is an important factor in adopting a healthy diet"*.

In addition, parents often use sweets and 'junk food' as a reward or as a means of persuasion with their children. Children therefore associate sugar with positive behavior and pleasure: *"Sweets and junk food are used as rewards by parents, which makes children even more tempted"*.

It is therefore essential to include parents in this process. It is important to guide parents towards information from reliable sources - a website approved by the government of their country, health professionals (pediatricians). Indeed, they often offer educational content adapted to the needs of parents and children.

#### ▪ **3.5.3 Leading to good health practices in a positive way**

Health rules can be stigmatizing and are not always followed by the target populations.

*"It is good for children to feel that they have a choice instead of being pressured"*.

Leading children and their families towards positive health behaviors must be attractive. Delivering the following message: *"Physical activity is good for your health"* will have more impact in the long term if it is done through gaming. Indeed, by being an actor in their behavioral change, children will take pleasure in doing things that they will reproduce on a daily basis.

*"Activity is not about sport, it's about movement and fun"*.

#### ▪ **3.5.4 A special focus on vulnerable groups**

It is essential not to stigmatize the population, which may take the messages as health rules. It is therefore necessary to strengthen the inclusion of vulnerable groups who are more affected by certain problems: a greater sedentary lifestyle due to the presence of screens in the child's environment: *"And the worse the social background, the more TV they have in their room"*.



Children tend to imitate everything they see in adults, especially in terms of screen time.

It can be seen that the nutritional quality of meals eaten during school time (snacks brought from home or meals in schools without canteens) by children is linked to the socio economic level of their parents. The high cost of healthy food and limited access to dietary variability is a barrier for families and does not encourage children to develop healthy habits: *"Industrial pastries and biscuits are much cheaper, for example, than fruit"*.

#### ▪ **3.5.5 Training of trainers**

Our informants state that training trainers (people in direct contact with children during school/out-of-school time) is essential for the sustainable acquisition of good health behavior.

Some school catering staff talk to children about food on their own initiatives. They do not have any specific training or documentation to discuss these topics with the children. Interested in this subject, they try to pass on good practices to the children from their personal knowledge and experience. If they use tools, they come from home and not from their employer. The training of local actors therefore allows for an increase in skills thanks to the transmission of basic notions for leading sessions with children. During these training sessions, workshop demonstrations are set up and the actors are trained in the use of edutainment materials.

It is interesting to have time to talk to the children and answer their questions when setting up health education sessions. However, this approach can be complicated, as it requires a good understanding of the concepts by the newly trained personnel who must be able to answer any questions the children may have. Answering children's questions can help guide them and enable them to make better health choices in the future.

#### ▪ **3.5.6 Complementarity of print and digital tools**

It is important to combine "real/physical/print" tools with digital tools and account on their complementarity. Digital media allow health prevention to continue at home. It is necessary to repeat the same message in different forms and through different channels. It is possible to use digital tools alone (such as digital games on nutrition) or combined with experiential learning (preparing meals with parents or trainers): «As children play digital games in their free time, designing a digital game related to nutrition could encourage students to learn through experience».



In the field, professionals notice an increasing demand for digital versions of materials by adults. Digital tools work well, whatever the audience (age, social class, etc.). This can be explained by the practicality of these tools, which allow people to consult and access information at any time. It is important to take into account that in rural areas, the population may have difficulties in connecting to the internet.

### ▪ **3.5.7 The most important message: fight against a sedentary lifestyle**

According to the participants of the focus groups, a sedentary lifestyle is the major problem they face on a daily basis. Indeed, lifestyle changes over the last 30 years have led to the development of unhealthy habits in both adults and children. *«Many spend their time sitting still and eating unhealthy food in front of a TV screen or computer»*. Children often imitate their parents who are more sedentary and often passive in front of their screens.

Involving parents in adopting healthier lifestyle behaviors for themselves and their children is a goal to be achieved. *«If you take them to the park or something, they will happily go. But if you don't offer them anything ... they will easily settle down in front of the TV, yes»*.

We can therefore see that the main theme to address with children is that of physical activity. It is absolutely necessary to reduce the level of sedentary behaviors of children and their families. School time is conducive to inactivity, as children spend long hours sitting still. It is therefore necessary to incorporate time for children to fidget in order to break this sedentary lifestyle.

*«Canadians after 30 minutes, they get up, and they're fidgeting for a minute. They're jumping up and down and all that, and I really believe that physical activity and brain power is the winning formula for good school results, I think that's absolutely the message that should be sent out»*.





## **4. T1.2 Analysis of the best practices in food education towards children**

An extensive literature review was conducted to collect information about the components of the successful food/nutrition education programs for children all over Europe that involve trainers/teachers and aim at improving their lifestyle habits, including nutrition and physical activity.

### **4.1 Objectives**

The aim of this review was to examine the most recently launched school-based interventions for promoting healthy lifestyle behaviors in Europe and evaluate their effectiveness/success, i.e. to describe the best practices performed by school-based interventions.

### **4.2 Introduction**

A healthful diet during childhood promotes optimal health, growth and cognitive development of the child and may contribute to the prevention of chronic disease in later life [1, 2]. Evidence suggests that eating habits adopted early in life track to some extent into adulthood [3]. It is therefore important to establish healthful eating behaviors early in life. However, dietary consumption surveys show that most European children do not meet these guidelines [4, 5]. Recent figures also show alarming and increasing numbers of obese and overweight children in Europe. This situation can be linked to social and lifestyle changes in Europe occurring over the last three decades with the development of unhealthy eating habits (evolution toward westernized dietary habits, rich in animal proteins, fats and with low consumption of complex carbohydrates and fiber) and sedentary lifestyles (decrease in energy expenditures) [6].

Schools are a crucial social environment for children and many attempts have been made to utilize this environment to promote healthful behaviors in youth, including healthful eating habits [7-9]. School-based interventions have the potential to reach almost 100 % of children of school age of diverse ethnic and socio-economic groups in the European context. Furthermore, in many European Union countries, primary schools serve at least one meal every school day. Other influencing factors at school for eating behaviors are food and beverages available at school outside meals (e.g. vending machines and school stores) and nutrition education classes. Schools therefore represent an important setting to promote and provide healthy nutrition and nutrition education [7, 10].



## 4.3 Methods

### 4.3.1 Strategy Used

A search of PubMed, Scopus, EFSA and Google Scholar databases was performed for studies published from January 2016 until June 2022. There is a plethora of reviews, investigating the effects of school-based interventions on health promotion in the previous years than the aforementioned ones. According to these, direct parental involvement is a common effective strategy followed by the active teachers' involvement in the delivery of intervention and the availability of healthy foods with the concurrent limiting of unhealthy foods. Therefore, we were focused on more recent scientific data, which have not been extensively reviewed, published in the last 5-6 years. Search terms were 'school based intervention', 'diet', 'nutrition', 'nutritional program', 'food education', 'hydration', 'water consumption', 'physical activity' and 'exercise' used individually and in combination ('school based interventions and diet or nutrition program or food education', 'school based interventions and physical activity', 'school based interventions and water consumption or hydration').

To be included in this report, the studies had to examine successful nutrition practices (best practices) in food education towards children. In addition, studies were included if they: (i) were investigated the effectiveness of a school-based intervention targeting physical activity behavior (PA), and/or nutrition behavior (NB); (ii) were clinical trials (iii) targeted children aged 6 to 10 years; (iv) conducted in Europe; (v) were written in English language.

Observational studies or review and family-based interventions were excluded.

### 4.3.2. Studies Retrieved

The initial database search yielded 245 publications. After screening titles and/or abstracts, the total number was reduced to 103. After careful review, 93 publications were excluded because they did not meet one or more of the inclusion criteria. Almost all of the excluded publications were studies that did not conduct in Europe or target preschool or adolescents.

## 4.4 Literature evidence

The studies included in the current analysis have been summarized in Table 1 outlining the target population, design, duration and type of intervention (diet only or diet and PA). The interventions in the Table have been arranged, based on the number of participants but with clustering the publications of the



same projects together. Of the 9 included studies, 5 examined interventions involving diet and PA and the other 4 examined diet only.

#### ■ 4.4.1 Diet

The majority of diet only interventions examined the potential association of a series of school-based interventions that combined only water (2 studies) [11, 12] or water and nutrition education (1 study) [13] with environmental changes in order to increase their water consumption and decrease sugar-sweetened beverages (SSBs) consumption (Table 2). These programs show potentials for public health impact with improving dietary behaviors, such as water consumption, free sugar intake and nutrition-related knowledge. Three interventions were based on the health promotion model [11-13], and one of them also based on ecological model [12]. In addition, one study involved teachers' training and participation of children's parents [11], another study involved teachers' training [13] and in the third intervention only children's parents participated and there was no teachers' training [12] (Table 1).

The DIATROFI program was conducted by directly comparing two different intervention approaches: food-voucher approach or free daily meal distribution and found that the meal distribution intervention was considered more effective than the food voucher one, not only because of its pedagogical benefits, but most importantly because it appeared to improve dietary habits, alleviate food insecurity and break stereotypes for parents and children through universal student participation [14] (Table 2). In DIATROFI intervention, children's parents participated without teachers' training (Table 1).

#### ■ 4.4.2 Diet and Physical Activity

Among diet and physical activity interventions, 2 involved teachers' training and participation of children's parents [15-17], 1 teachers' training [18] and 1 participation of children's parents [19]. The intervention program of one study was based on the health promotion model and social cognitive theory [18] and the intervention program of another one was based on social cognitive theory [17]. Three studies had a benefit to anthropometric measurements [15-17, 19]. Specifically, 1 study showed a reduction in the incidence of obesity [15, 16], 1 showed an increase in the % of children of normal body weight [17] and one found a reduction in waist-to-height ratio but this reduction was shown only to 10-year-old children [19].

Furthermore, 2 studies had a positive effect on biomarkers and blood pressure (BP) [17, 19]. In particular, glucose and triacylglycerides (TAG) concentrations were reduced [17]. Four studies found favorable results for at least one nutrition behavior outcome [17-20]. These behaviors include breakfast consumption [17,



20], adequacy of vegetables consumption, moderation in sodium intake [18], fiber intake [19] and better diet quality [17]. Finally, one study showed improvement in self-efficacy of children [20].



Table 1. General characteristics of the included studies

Program name	Country	Study design	Duration	Population group	Involve parents	Teachers' training	Social Cognitive Theory	Ecological Model	Health promotion model	Authors
<b>Diet only</b>										
<i>Diatrofi</i>	<i>Greece</i>	RCT	1 school year	N= 6288, elementary and secondary schools	X					Dalma et al.,2018 [14]
<i>'H2NOE Water Schools</i>	<i>Austria</i>	non-randomised controlled cluster trial	1 school year	N = 1148, 8 years old	X	X			X	Griebler et al.,2021 [11]
<i>HKCC</i>	<i>United Kingdom</i>	non-randomized CT	1 school year	N =931, 8-14 years old	X			X	X	Irwin et al., 2019 [12]
<i>ACTION</i>	<i>Austria</i>	RCT	5 weeks	N = 344, 5th grade		X			X	Winzer et al. 2021 [13]
<b>Diet &amp; PA</b>										
<i>POIBA</i>	<i>Spain</i>	multicomponent and multilevel RCT	1 school year	N= 3073, 9-10 years old	X	X				Ariza et al., 2019 [15]
				N=1653, 9-10 years old	X	X			Sánchez-Martínez et al., 2021 [16]	
-		RCT	6 weeks	N= 1609, 9-15 years old						Altay et al. 2020 [20]
<i>Health Promotion Intervention to Improve Diet Quality in Children</i>	<i>Portugal</i>	RCT	6 months teachers's training/ 5 months implementation	N=294, 6-12 years old		X	X		X	Rosário et al. 2017 [18]
<i>HHP</i>	<i>Spain</i>	RCT	8 months	N= 158, 5th or 6th grade	X	X				Pablos et al., 2018 [17]
<i>Project Spraoi</i>	<i>Ireland</i>	RCT	2 years	N= 101, 6 & 10 years old	X				X	Merrottsy et al., 2019 [19]

RCT: Randomized clinical trial, PA: Physical activity



*Table 2.Components of intervention programs*



Program name	Intervention	Outcome measures			Authors
		Anthropometrics	Nutrition behavior	Other	
<i>Diet only</i>					
<i>Diatrofi</i>	Intervention A: daily lunch bag Intervention B: food-voucher		↑ positive food preferences at school	↑ Self-organization	Dalma et al., 2018 [14]
<i>H2NOE Water Schools</i>	Free refillable water bottle and workshops		↑ Water consumption		Griebler et al., 2021 [11]
<i>HKCC</i>	Education programs about Water and SSBs consumption and Water bottle filling stations		↑ Water consumption ↓ SSBs consumption	↑ nutrition knowledge	Irwin et al., 2019 [12]
<i>ACTION</i>	Diet and Hydration sessions		↓ Free sugar intake		Winzer et al., 2021 [13]
<i>Diet &amp; PA</i>					
<i>POIBA</i>	Evaluation of Body Weight, Diet & PA sessions, Family workshops, Subsidized fees for extracurricular sports for some families	↓ Incidence of obesity			Ariza et al., 2019 [15]
		↓ Incidence of obesity			Sánchez-Martínez et al., 2021 [16]
-	Evaluation of Body Weight, Healthy lifestyle sessions, workshops and booklets		↑ Breakfast consumption	↑ Self-efficacy	Altay et al., 2020 [20]
<i>Health Promotion Intervention to Improve Diet Quality in Children</i>	Interactive Overweight and Obesity prevention, Diet, PA, Hydration and Cooking sessions Sessions delivered by trained teachers who took the same sessions		↑ Vegetables adequacy ↑ sodium moderation		Rosário et al., 2017 [18]
<i>HHP</i>	PA sessions and activities, Interactive Healthy habits sessions, Sessions delivered by trained teachers, Worksheets completion about healthy habits, Workshops for family and teachers	↑ prevalence for BMI according to level	↑ proper breakfast consumption ↑ better diet quality	↓ Glucose ↓ TAG ↓ BP ↑ VO <sub>2max</sub>	Pablos et al., 2018 [17]
<i>Project Spraoi</i>	PA and nutrition sessions and PA classes	↓ Waist to height ratio (only 10 years old children)	↑ Fiber intake (only 6 years old boys)	↓ Systolic & diastolic BP (only 10 years old children)	Merrottsy et al., 2019 [19]

BMI: Body mass index, BP: Blood pressure, PA: Physical activity, SSBs: Sugar-sweetened beverages, TAG: Triacylglycerides, VO<sub>2max</sub>: Maximal oxygen uptake.



#### ▪ 4.4.3 Key points/ Useful definitions

##### **Social Cognitive Theory (SCT)**

SCT is one of the most widely used and robust health behavior change theories. There are three major constructs in SCT that interact to influence behavior: personal factors (age, cognitions, previous experience with the behavior, etc.), environmental factors (access to resources, safety, support from family/friends, etc.), and aspects of the behavior itself (vigor of the behavior, outcomes achieved as a result of practicing the behavior, competence with the behavior, etc.). Successful efforts to change behavior depend on identification of the positive supports and the detractors in each of the three constructs. SCT can be readily applied to nutritional intervention for prevention programs [21].

##### **Self-efficacy**

Self-efficacy is a person's confidence in his or her ability to take action and to persist in that action despite obstacles or challenges. Self-efficacy is an additional construct in SCT which influences behavior change (such as health behavior, dietary change efforts) significantly. Self-efficacy has been shown to predict the amount of effort an individual will expend to learn and practice a behavior, the persistence demonstrated in the process, and the effort expended to overcome barriers. Self-efficacy can be increased using three types of strategies: (1) setting small, incremental, and achievable goals, (2) using formalized behavioral contracting to establish goals and specify rewards and (3) monitoring and reinforcement, including individual self-monitoring by keeping records. In group nutrition programs, it is possible to easily incorporate activities such as cooking demonstrations, problem-solving discussions and self-monitoring [21].

#### **4.5 Best practices/ Conclusions of the evidence**

Diet and PA interventions had favorable results in a series of health outcomes such as anthropometric measurements, biomarkers, nutrition behavior and self-efficacy whereas only diet interventions had a positive impact only on nutrition behavior and specifically they lead to increased water consumption. It should also be noted that the majority of successful interventions included participation of children's parents and teachers' training.

Children's parents were involved in different ways at each program. These ways include information material about healthy food habits (lunchbox ideas, hydration, tasting sessions and education sessions on high-sugar beverages and takeaways), family workshops on food and physical activity in school, complete





program sheets with their children (measuring child's eating and drinking habits), food vouchers. Moreover, parents participated in focus groups about perceptions regarding the program, triggers and barriers of participation, attitudes towards the program and suggestions for the optimization of the program's implementation.

Teachers' training about the program of intervention was conducted by workshops concerning healthy habits for school children, teaching material (re-printed posters for drinking rules or pre-prints to record the children's fluid intake). Finally, in one program teachers delivered the learnt contents (overweight and obesity prevention, concepts of food, nutrition, and dietary guidelines for children and families, hydration and the importance of water, strategies to encourage fruit and vegetable consumption and to reduce low-nutrition, energy-dense foods, appropriate physical activity levels and strategies to reduce screen time, healthy cooking activities) and then they developed creative and engaging classroom activities about the addressed topics. Themed games and modified sports were performed designed with the following features: fun, inclusion and cooperation and safety.



## **5. T1.3 Interviews**

As part of the first part of this project, qualitative research was carried out to understand and analyze the needs and requirements of trainers and their learning and teaching preferences. Twelve interviews were conducted in three countries: France, Spain and Greece.

### **5.1 Objectives**

The aim of these interviews was to analyze the needs and requirements of trainers, and to understand their learning and teaching preferences.

### **5.2 Participants**

In France, twelve interviews were conducted by AgroParisTech (Paris and Greater Paris area) plus a researcher from Le Havre University for more diversity. In these interviews 4 teachers, 3 school directors/ former teachers, a director of an after-school activity center, a director of the school canteen, a school canteen manager, a person in charge of extracurricular activities and an extra-curricular activity leader participated. In Spain five interviews were conducted in canteen workers and ten interviews were conducted in primary school teachers by HUA in Greece.

### **5.3 Introduction**

#### **▪ 5.3.1 Structure of mealtimes in France, Spain and Greece**

##### **The school catering system in different European countries**

The time spent by children aged 6 to 11 in the school structure is not the same in all European countries. In most countries, such as France and Spain, school time is spread over 5 days, with classes in the morning and afternoon (in France, not on Wednesday afternoon). In contrast, in other European countries, school time is spread over the morning only, so there is no school meal system in place. Lunchtime allows children to relax in the middle of their school day. It is also a moment of pleasure, and sometimes allows the discovery of new foods.

In Spain and France, it has been noticed that the attention to food has changed in the canteens, with more healthy options, efforts have been made on nutritional quality with more vegetables. Meals are balanced over the week. In families, many do not pay so much attention to their children's healthy diet, so "there is



a gap between families and the canteen's view of the healthy menu". Indeed, in some poor families, the school meal is sometimes the only balanced meal the children have in their day.

In France, the maximum teaching time in primary schools is 24 hours per week. As a general rule, children attend school for 9 half-days: Monday, Tuesday, Thursday and Friday as a full day (8.30-16.30), and Wednesday morning (8.30-11.40). Each school must provide a canteen service, with a hot dish and in compliance with nutritional and food safety specifications. It is mandatory to have one vegetarian menu per week. According to a 2022 law (Egalim law), public canteens must serve at least 50% sustainable or quality products, including 20% organic, from 1 January 2022. In primary schools, the people in charge of the canteen depend on the commune's town hall. There are two options: either the communes provide the service themselves, or they delegate it to private catering companies, which then supply the meals from a central kitchen. The staff of the reception centers, including during meals, and the extracurricular activities may be the responsibility of the town hall or of associations in close contact with the town hall. The trainers noted that the demands of some parents have changed. They used to want to be sure that their children were full and are now more sensitive to the quality of the products, but also more demanding in terms of diets adapted to their religion.

In some canteens, the provision of two types of portions, in canteens in some schools, indicated by two smileys, one for "I like" and one for "I taste" (smaller portion), allows children to discover new flavors.

In Spain, most schools have a canteen where children can have lunch, a meal consisting of two courses plus a dessert, bread and a drink. This lunch break can start at 12:30, 13:00, 13:30 or 14:00. Normally, the school council (an organization in state schools made up of representatives of the administration, teachers and families) is responsible for selecting an outside company that will run the lunchroom. This company is in charge of the catering (programming, preparation and distribution of menus and all actions to ensure compliance with requirements and hygienic-sanitary controls), but also of the supervision of the children, both during the provision of the food service and in the periods before and after it. Some concerted schools (co-financed by the government and the families) and private schools (monthly fee paid by the families) may have their own kitchen staff and therefore do not need to hire an external company. The staff responsible for the canteen consists of a general manager of the school canteen, nutritionists (responsible for developing a healthy monthly menu), chefs and kitchen assistants and canteen supervisors, who are the only employees in direct contact with the children during lunch and free time.

To ensure the smooth running of the school canteen, there is also a need for a cleaning service, and possibly other types of staff, such as for transport.



In order to work as a canteen monitor, staff must have the 'food handling qualification', which is a physical or digital document certifying that the person in possession of it has undergone training in food hygiene, in accordance with Regulation (EC) No 852/2004. The law does not require other qualifications for these jobs. For both countries, lunchtime is between 1.5 and 2 hours: one hour for eating and another hour for children's leisure.

In Greece, the school day starts at 08:15 and ends at 13:15. Therefore, there is no canteen service that has been set up by schools or municipalities. However, there are schools that offer additional optional classes and operate until 4pm. In this case, children bring their own lunch (parents are responsible for its preparation and composition) and eat it at their desks in the classroom, where their teachers are present. There are therefore no professionals dedicated to school catering. The majority of trainers interviewed reported that the lack of school meals on offer is a real problem. Pupils usually bring their own snacks, which are most often seen as 'junk food'. Trainers assume that parents do not have enough time or money to provide healthy snacks for children.

Thus, an intervention in Greece could only be implemented through educational programs given by teachers/out-of-school facilitators and training of parents to provide their children with a healthy lunch.

## **5.4 Main results**

### **▪ 5.4.1 Trainers' preferences and needs**

During these interviews, the trainers were able to express their preferences for the implementation of preventive health actions with children. Their experience of working with the children targeted by the EFFECT project is essential for the effectiveness of future actions to be developed.

In Greece, the majority of trainers would prefer to promote prevention among children, by implementing a well-designed course, supported by validated institutions, with a focus on health issues. In addition, they reported using digital and print media as general teaching methods in their daily practice. These educational materials are mainly aimed at children and parents of secondary school children. The tools and materials they use come mainly from validated institutional material (school books) and self-created material. In addition, it was suggested by one trainer to set up seminars, organized by trainers or health professionals, or to implement activities such as visits to food industries or sports facilities.



Spanish trainers emphasized that any material with a protocol or guide is welcome, but they insist that children should be able to actively participate in the program. They would like to have a program with explanations and activities. Training for professionals working with children (teachers, school catering staff, after-school care staff, etc.) is needed to understand the "concept of healthy eating and good health behavior".

In Spain, all the interviewees, work in canteens, use self-created games and tips about healthy eating and they have not received validated resources for this.

Similarly, in France, a teacher stressed that training and support would help her to promote health behaviors among children.

These training sessions will be a moment of transmission of knowledge to the trainers, but also an opportunity to exchange with other professionals working with children. For example, a teacher would like to be guided on how to say things without judging, which is very difficult when dealing with children or parents who have very difficult living conditions.

In the three countries studied, the trainers reported that the initiatives are most often taken by someone themselves (teacher, youth worker, or canteen workers), as they volunteer to propose an activity to the children.

#### ▪ **5.4.2 Key factors for the success of a program**

Several important points emerged from these interviews as key factors for successful prevention action in schools or pre-schools.

Firstly, the active participation of children is essential. All trainers recommend games (e.g. crosswords), plays and workshops, but combined with a theoretical part.

In addition, trainers from each country suggested that involvement of children's families is important, as they play a role in the children's taste and food preferences. Inviting parents, for example to organized events, can be a way to pass on information about good health behaviors.

In France, a teacher obtained some posters from a validated institution (Manger- Bouger), in particular to combat the lack of hygiene (e.g. hand washing) of some children in her class and to adopt good eating practices. These posters have been and continue to be a source of discussion with children and sometimes



parents. Most children follow her advice and become ambassadors to their parents. They say that their children do not want to bring their snacks to school if they do not follow the teacher's advice.

Two trainers emphasized that a prevention action aimed at inducing good behavior in a child takes place in several sessions and must be carried out over time.

In addition, a pooling of knowledge and interests of trainers can participate in, and even drive, the implementation of actions in schools and after-school centers. Communication with children is also very important. Children are more interested in the intervention if they understand its purpose. Giving them the freedom to express themselves and answer their questions helps to arouse their curiosity.

The support of the school and institutions will make it easier for trainers to implement preventive health actions with children. The development of programs in schools will allow teachers to be better informed about what already exists, and to implement actions more easily with the help of a reference framework on good practices. Finally, coordination between teachers, canteen staff and activity leaders is very important so that everyone feels involved and valued in the project. All these actors have knowledge to pass on to the children in terms of good health behavior.

#### ▪ **5.4.3 Main barriers**

Several barriers to the implementation of actions to promote healthy behavior among children were raised. Firstly, the lack of knowledge on the part of trainers and of tools on good health behavior is a crucial point in this project. Providing them with appropriate training is necessary to enhance the role of trainers and give them real expertise in the field. Furthermore, providing them with well-designed material, adapted to the target audience and validated by the institutions, seems to be relevant for the good progress of this project.

The lack of time and money was mentioned by the majority of trainers. Indeed, the preparation of these actions is most often carried out thanks to the involvement of the trainers and requires a lot of preparation time. In addition, school curricula are already dense, and it can be difficult for teachers to find a time slot to address this type of subject. Lunchtime does not necessarily seem to be a solution either, as children already have little time to come to the canteen, have lunch, rest and play in the yard. In addition, there is often one counselor for every 20 to 25 pupils at lunchtime.



In terms of resources, the school or municipality must be involved in the implementation of these activities. In France, the resources allocated to extracurricular activities vary according to the city. For example, in Paris, the teacher can be reimbursed for the purchase of seeds for the children to grow, whereas in Le Havre, in schools with children from disadvantaged backgrounds, the teachers have fewer resources and pay for them themselves. In fact, every French school has a school fund that is paid for by parents to finance extracurricular activities, such as the purchase of small items or outings for the children. The more parents give, the bigger the budget. Therefore, the poorer the school area, the less resources there are for extracurricular activities.

The lack of material and equipment in schools was also raised. Not all primary schools in France, Spain and Greece have a video projector, which can be used to project images or videos on the board. In Greece, a trainer added that there was a lack of computers, a library and additional classroom space. A kitchen would also be useful.

The children's parents were also seen as a barrier by the trainers, as children's eating behavior and physical activity depend on the family environment. The trainers therefore proposed a more active involvement of parents in prevention programs.

A French teacher pointed out that parents are generally not very involved and do not come to the workshops on prevention that are organized. A trainer suggested educational kits to facilitate the back-to-school meeting, because at this time, parents are very receptive and want to do well for their child. It can be useful to let the parents come to the school, to know better how the children live at home, how they eat.

The lack of experts to talk about these health topics was also discussed. Speakers such as nutritionists could be interesting, as there is a perceived legitimacy among parents and this could bring more parents into the school.

Finally, it can be difficult to set up training workshops for facilitators, as many of them are employed part-time. Education in health behaviors depends very much on the educators and their interests in the subject. A child who goes to a class where the teacher is passionate about a subject is more likely to be so.

## **5.5 Proposed actions**

### **▪ 5.5.1 Nutrition & Hydration**



During the various interviews and in each country, it was found that the topic of food is the one EFFECT most easily discussed with children, whether by teachers, canteen workers or after-school care staff. In fact, all of them consider that this subject is not sufficiently discussed with children, whether in their school, after-school or family ecosystem (for a large proportion of the children). The interviewees noted in France, Spain and Greece that a majority of children bring a lot of processed, fatty and sugary products (cakes, crisps, sodas) in their school bags as snacks for school.

In Greece, a teacher implemented a program covering mainly nutrition topics such as healthy eating and food groups. Positive changes in the school environment, mainly in terms of more frequent discussions on nutrition issues, were noticed among the children. In addition, some trainers observed positive changes in the home environment of the children they supervise, mainly due to the increase in home-cooked meals.

In Spain, all the canteen workers use games and tricks they have created themselves to explain healthy eating to children, and they have not received validated resources for this. As part of this, they try to explain the benefits of the nutrients in the meals they eat. They also want children to enjoy learning and discovering new things, and one speaker suggested covering the children's eyes and tasting a dish/food to guess what it is.

*A canteen worker (Spain):" We are doing a job of educating children about nutrition [...] We don't just give them food and that's it, we have to put out a lot of resources to try to convince them to try the food"*

*A canteen worker (Spain):"Children need to know what they should eat, which vegetables to eat, which legumes to eat, they need to know what to eat at each meal... That sometimes there are foods that we don't like but that are necessary for our daily functioning, and these messages we have to reinforce here at school."*

In France, some teachers and youth workers are also trying to provide nutrition education to children. Indeed, one trainer used the nutrient pyramid to explain that one should eat everything, but in reasonable quantities, for example. Workshops on flavors: sour/sweet/savory/umami were organized in some classes. The children are gradually identifying the flavors, which is not the case at the beginning of the year (for example from chocolate). The participation in the week of taste by the whole school has already been implemented as well as sessions on the explanation of the composition of food and the interest for the body of each contribution. A session explaining the composition table on 3 packets of cakes by comparing





the boxes has also already been carried out in some classes. The aim is to allow the children to discuss the subject with their parents and for the children to keep a memory of it for later. A cooking workshop with the parents of volunteer pupils has already been set up. It mainly involves peeling, preparing and cooking vegetables.

In addition, trainers have proposed taste education activities by bringing in a food once a week that is studied in class according to the themes and seasons, for example dairy products with cow, sheep, goat products. One teacher also proposed a workshop on dairy products funded by Nestlé, with products distributed in the school. This program was very successful with the children, but the teacher was uncomfortable highlighting a food company in the school because of conflicts of interest. Canteen managers and staff can also carry out specific actions to encourage greater consumption of fruit and vegetables. One meal provider offers an activity with a dietitian who comes to the classroom to give breakfast. The aim is to follow up in class, for example with drawings of their breakfast at home before and after the activity. This is a way of making them aware of balanced eating and seasonal consumption. This activity takes place at best once a year. The dietitian in charge of the meals, paid by the city or by the supplier, plays an important role in leading the activities. Other actions, such as making fruit salads with the children or organizing dishes that are enjoyed by the children, by the facilitators, with fresh vegetables and prepared with the children to garnish the kebabs, for example, have also already been carried out in some French schools. But the preparation of these workshops is very time-consuming, and therefore requires a strong involvement of the teacher. These workshops are, however, rewarding for the teacher, as he or she feels that he or she can pass on a number of messages to the children and their parents.

In a school in Le Havre (in a deprived area), during the first week of the new school year, the children are invited to bring their breakfast and a discussion takes place on what a balanced breakfast is and what they can do to change. The children take pictures of their breakfast and bring them back to class. She then brings in the parents for a discussion. In addition, school outings, for example to the beach to study seafood: mussels, shrimps and their nutritional benefits, were carried out by one of the trainers.

It is clear that the role of food culture is important in the occurrence of obesity. Indeed, the culinary heritage can favor the consumption of certain high-calorie foods, derived from traditional recipes. The status of the nurturing mother in some families is still very present. Prevention is necessary because these children and their parents are completely helpless and the school can help guide them. It is one of the essential vectors



for changing behavior. Indeed, the teacher's word is listened to by the children and is therefore very powerful because it is sacred to the children.

#### ▪ **5.5.2 Physical activity**

A sedentary lifestyle is one of the major problems of the 19<sup>th</sup> century. Encouraging children to keep moving is therefore essential.

In Spain and Greece, some trainers have noticed positive changes in physical activity, as some schools offer extracurricular activities, with sports instructors (karate, swimming, judo, dance etc.). The availability of sports facilities in the city can influence children's participation in sports.

In Greece, it has been noted a decrease in physical activity in families in recent years due to the high workload and screen time of children, as well as the increased working hours of parents. However, two teachers reported positive changes, as some children frequently participate in extracurricular physical activities such as football, basketball, etc., in sports clubs. In France, some cities seem to be more supported by the municipalities in organizing physical activities or sports. It was noted that parents have an increasing expectation of sport.

Today, in France, the emphasis on sport in official educational programs is increasing. Trainers speak of the "school inspector's injunction". Each pupil is supposed to do 15 to 30 minutes of physical activity per day, and it is up to the teacher to organize it, without any special training or supervision. This new regulation could be an opportunity for EFFECT, as teachers will need help to implement these activities.

Finally, in all three countries, the lunch break as well as the breaks during the day are considered by the children to be "free time", and therefore will often be used to set up games. In the playground, play leaders can propose many fun activities, tournaments between schools in the town. In many schools, physical education classes and unstructured games during breaks are the only opportunities for physical activity at school.

#### ▪ **5.5.3 Sustainable development**

The interviewers also asked the trainers how they understand the concept of sustainable development. The trainers indicated that the topic of sustainable development is necessary but difficult in schools.



In Greece, most trainers indicated that sustainable development refers to environmental protection. Some also indicated that it refers to recycling, the use of renewable energy sources or the use of seasonal products. In France, some teachers' initiatives on sustainable development often involve waste sorting. Children collect paper in the yard or in the street and are happy to do something good for the environment themselves, a "good action". An extracurricular activity leader indicated that he includes environmental actions in the educational project. For example, videos on how to turn off the taps properly, whether it is better to take a bath or a shower etc. A climate fresco has also been set up in one school, to stimulate children with visuals.

A teacher tries to make the children aware of their responsibilities and of sustainable development with everyday examples (e.g. why use a flask instead of cans or plastic bottles) and gives them advice such as choosing bread with two squares of chocolate rather than biscuits in individual bags for the afternoon snack, and solutions for reducing waste. In some canteens, sorting tables are available as well as animations to present seasonal fruits and vegetables.

In addition, it was noted that parents are increasingly aware of food waste.

The implementation of actions around sustainable development depends above all on the initiatives of the cities, such as the installation of sorting tables in the canteen to facilitate the recycling of leftovers. In addition, some cities have plans to plant the schoolyard to provide oases in case of heat waves. The situation is therefore very different depending on the commitment and means of the commune or town.

Unlike food and physical activity, education on sustainable practices seems to be less developed, probably because adults are just starting to be aware of it. They are interested and willing to implement sustainable programs if they are helped through kits distributed in schools. Of the respondents in Spain, none of them know and work with the meaning of sustainable development. They have never implemented any actions addressing this issue in their workplace. This shows that there is a lack of training in sustainable development for professionals working in canteens in Spain.

#### ▪ **5.5.4 Vegetable gardens**

One proposal for action that came up several times during the interviews was to set up a vegetable garden in schools or after-school centers. This is an opportunity for pupils to learn about plants by planting, cultivating and harvesting them. It is also an opportunity to discover the preparation and taste of these fruits and vegetables. However, there is a problem of seasonality, as most of the fruits and vegetables that



can be easily grown in a vegetable garden are harvested in the summer, when the school is closed for the summer. In France, a teacher has set up a vegetable patch in the schoolyard, which has grown radishes, salad and raspberries. She buys these products in a supermarket so that all the children have them when she does an awareness-raising activity. In Greece, school garden programs also included lectures, specific activities (crosswords, games, painting) and the reward method.



## 6. CONCLUSIONS

Diet and physical activity interventions have favorable effects in several health outcomes, such as anthropometric measurements, biomarkers, eating behaviors and self-efficacy, whereas diet-only interventions had a positive impact on specific eating behaviors. The majority of successful interventions included participation of children's parents and teachers' training. These components were also proposed by trainers in the context of focus groups and interviews that were conducted. A variety of proposals/ideas and intervention tools were proposed; their implementation may be limited by the school budgets.



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