

## **A School Based Intervention for Combating Food Insecurity and Promoting Healthy Nutrition in a Developed Country Undergoing Economic Crisis: A Qualitative Study**

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Archontoula Dalma. Head of qualitative analysis. Prolepsis Institute of Preventive Medicine Environmental and Occupational Health. Address: 7 Fragoklisias str., Maroussi, 15125, Athens, Greece; **Abstract**

**Introduction:** Aiming at reducing the rates of food insecurity and promoting healthy diet for children and adolescents, we designed and implemented the Program on Food Aid and Promotion of Healthy Nutrition - DIATROFI, a school-based intervention program including the daily provision of a free healthy mid-day meal in disadvantaged areas across Greece. We conducted a qualitative study with educators and school principals, in order to explore their perceptions and attitudes towards the Program, its effects on child malnutrition and learning environment in participated schools with regards to healthy nutrition, and its further social and pedagogical aspects.

**Significance of the study:** This is the first study that explores the social aspects and pedagogical potential of a school-based healthy nutrition intervention in disadvantaged areas of a high-income country, currently undergoing severe economic crisis, as it is realized by educators and school principals who have experienced its implementation.

**Objective:** The study's primary purpose is to explore the effects of a school based healthy nutrition intervention on students' learning as regards to healthy nutrition as well as on social and educational environment of schools in disadvantaged areas. The analysis focuses on educators' and school principals' perceptions of the intervention and the meals themselves, as well as their involvement in and attitudes towards the Program.

**Methods:** 136 schools with 23,044 students participated during the 2012-2013 school year in the DIATROFI Program. Every day, all students of the participating schools received a daily healthy meal, designed by nutrition specialists. Informational materials (brochures, leaflets and games) promoting healthy nutrition were distributed to all students and parents, combined with presentations by health promotion specialists. Focus groups methodology was employed. Eligible participants included elementary and junior high school educators and school principals from the participating schools in the intervention program. 20 focus groups were conducted (April – June 2013), 5 each with educators and school principals respectively in elementary schools, and 5 each with educators and school principals respectively in junior high schools. The 10 schools were randomly selected. The sample consisted of 136 participants in total; 40 educators and 33 school principals in elementary schools and 36 educators and 27 school principals in junior high schools. A discussion guide was developed, in relation to perceptions of and attitudes towards the intervention and

## Forum on Public Policy

its effects on the involved actors and the school environment. Analysis of the transcripts was done using the Krueger's method.

**Results:** Educators and school principals emphasized the social benefits of the program for the families in need. They stressed the multiple benefits of the participation of all students, since it generates peer-influence that enhances students' consumption of the mid-day healthy meals, while influencing positively the school-climate. Both school principals and educators pointed out that due to the participation of all students social stigmatization of the students in need was not only avoided but also reduced, while solidarity and collegiality were strengthened. Educators and school principals mentioned that the program is an important step towards the promotion of healthy nutrition that enhances the pedagogical work in schools. Educators in elementary schools stressed out that the healthy mid-day meals were "the theory in practice", since they complemented lessons concerning healthy nutrition. Junior high schools' educators other than those teaching Home Economics mentioned their lack of knowledge with regards to healthy nutrition. Moreover, they felt insecure to promote healthy eating to adolescents through valid arguments on the benefits of a healthy diet. School principals and educators in elementary and junior high schools stressed out the importance of family in children's healthy eating habits. Both school principals and educators mentioned their need for nutrition education. Especially, educators in elementary schools and teachers in Home Economics in junior high schools expressed their need for further resources to enhance their work on healthy nutrition.

**Discussion:** Overall, the results suggest that the daily provision of a free healthy mid-day meal to all the students of the participating schools in socioeconomic disadvantaged areas, along with actions that promote healthy nutrition, combat child malnutrition and generate learning opportunities that increase the pedagogical work of school. Yet, in order for the full pedagogical potential to be reached, especially with regards to the promotion of healthy nutrition, collaborative efforts of school principals and educators as well as the support of parents are required. Moreover, the provision of nutrition education, training, and resources for both educators and school principals was deemed of great importance for the successful promotion of healthy nutrition to students.

### Introduction

Combating food insecurity is a high priority on the agenda of the Development Cooperation Forum of the United Nations (UN 2012). Addressing food insecurity has been identified as the No. 1 Millennium Development Goal (MDG1), and it also has had great impact on MDG4 and MDG5 (reducing the under-5 mortality rate and maternal mortality rate) (UN, 2012). The prevention and treatment of child malnutrition and childhood obesity are strategic priorities both for the World Health Organization (WHO 2013) as well as the Directorate General for Health and Consumers of the E.C. (European Commission, 2010).

According to the European Directorate report on Human Rights, the number of children who are at risk of poverty and social isolation in Europe, and especially in Greece, is continuously increasing due to the economic recession (FRA 2012). In Greece, it is estimated that 686,000 children (35.4%) are facing that risk (UNICEF 2012). The ongoing economic crisis in the country has resulted in increased rates of unemployment, income reduction and economic insecurity, with more adverse consequences in socioeconomically vulnerable areas (EUROSTAT 2014).

According to WHO (2013), adverse economic conditions can lead to poor food choices and eating habits, negatively impacting the health of children and adolescents. It is important to note that, as stressed by OECD (2014), childhood obesity and child malnutrition often go hand in hand. In the past decade rates of childhood obesity have increased globally. Greece currently has one of the highest rates of childhood obesity in Europe, ranking first among the 27 member states in the EU (OECD 2014). Actions targeting both problems childhood obesity and child malnutrition are of crucial importance.

## Forum on Public Policy

Given increasing concern for children's health, policy measures have been adopted in developed as well as developing countries that involve large-scale governmental or privately funded food aid programs that supplement children's nutritional intake at school (WFP 2013). Among them, the most effective ones were implemented for long periods of time, and included educational lectures and activities to increase diet quality and physical activity, supplied healthy food choices to the institutions, and involved participating children's family members and participating school's staff (Wang et al. 2012).

Evidence suggests that school feeding programs have multiple positive associations including weight reduction in obese children, improved eating habits of students (Doak et al. 2006; Flodmark et al. 2006), reduced school dropout rates and improved attendance (Jukes et al., 2008), improved academic performance (Belot and James 2011), and strengthened communication and trust among educational stakeholders (Rossi et al., 2008). However, research so far on school feeding programs has not included high income countries experiencing prolonged economic recession. Furthermore, there is a need for further research on the aspects of food insecurity and healthy nutrition in schools that are located in lower socioeconomic settings in these countries.

The goal of this study is to qualitatively identify the effects of a school feeding program that take place/realized in underprivileged areas across Greece on students' learning on healthy nutrition, as well as on the social and educational environment of these schools as reported by educators and school principals who experienced the program's implementation. The program was developed to reduce the rates of food insecurity and promote healthy dietary habits for children and adolescents through the daily provision of a free, healthy mid-day meal in schools located in underprivileged areas of Greece. Qualitative research that was conducted in similar interventions in the US and the EU, revealed the negative impact of social prejudice and stigmatization on students' participation, the important role of parental influence on children's eating habits as well as the learning potential and the pedagogical aspects of such programs (Bailey-Davis et al. 2013; Slusser et al. 2011; Benn and Carlsson 2014). In the present study, focus group methodology was adopted, allowing for a deeper understanding of socially shared knowledge -experiences and views- of the target population on students' food insecurity and healthy eating as well as on aspects of the implementation of a school feeding program in a developed country currently undergoing a severe economic crisis (Rabiee 2004).

### **Methods**

#### *The program on food aid and promotion of healthy nutrition - DIATROFI*

The Program on Food Aid and Promotion of Healthy Nutrition, "DIATROFI" has been implemented since 2012; it targets students attending both elementary and secondary schools in areas of low socioeconomic status (SES). Postal codes with an average per capita income, as depicted in the taxable income database of the Greek Ministry of Finance, below specific standards were considered areas of low SES. In particular, schools were categorized in three major regions, Attica, Thessaloniki and the rest of Greece. Different conditions were set by region, so as to cover approximately 25% of Greek public schools. After establishing initial contacts with all schools in low SES areas; a total of 347 schools' principals, corresponding to 60,074 students, declared their willingness to participate for the 2012-2013 school year and completed the relevant application form.

Depending on funding availability, a set of criteria was used to prioritize the applied schools. These included (a) regional taxable income, (b) regional unemployment rate, (c) written reports by school principals providing estimates of the number of students facing food insecurity and special characteristics of schools (i.e. students from social institutions, Roma students, fainting episodes), (d) food insecurity measurements available from the previous school year, and (e) personal interviews with teachers, parents and other school

## Forum on Public Policy

personnel, conducted by an expert in qualitative methodology, to weigh the level of food insecurity in the school. During 2012-2013, 136 schools with 23,044 students were finally selected to participate. All students of participating schools were offered the opportunity to receive the free meal, irrespective of their socioeconomic status, so as to avoid stigmatization. Parents who did not wish their child to participate provided a signed statement; only 2% opted not to participate.

Each student received, on a daily basis, a meal in a box, designed by nutrition specialists so as to cover 25%-30% of children's daily requirements in terms of energy, with the exclusive use of olive oil. The meal included every day a cereal-based food item (sandwich made with cheese and either vegetables, egg or chicken; or a spinach pie), three times a week pasteurized white milk (2.5-2.8% fat content) or yogurt with honey, two times a week cheese (as a part of the sandwich or pie), and every day fresh seasonal fruit. All program participants received the same foods; however, meals distributed to children and adolescents were different in terms of quantity, in order to satisfy age-specific energy needs. Moreover, students of the participating schools are responsible for the daily distribution of the healthy meals. Two students in each class are selected each day or week to distribute the meals to their classmates. Focus groups were conducted to explore parents' attitudes towards healthy eating, their children's attitudes, the free provision of a daily school meal and other initiatives in the context of school, family and the community. In the present analysis we report the results of the focus groups conducted on both school principals and educators in Elementary and Junior High schools.

### *Focus group methodology*

Focus groups were conducted during 2012- 2013 school year with two researchers present: the moderator, who posed the questions and monitored the conversation, and the assistant moderator, who was in charge of the recording equipment and kept notes of the participants' responses. All group discussions were recorded and subsequently transcribed, using the assistant moderator's notes when needed. Before initializing the discussion, the moderator explained the nature of the study. The duration of each focus group was 60-90 minutes. Participants provided their consent for themselves. The study procedures were officially approved by the Institute of Educational Policy that operates for the benefit of public interest as an executive scientific body supporting the Ministry of Education and Religious Affairs for scientific and research issues related in primary and secondary education.

### *Focus groups participants*

Eligible participants in the focus groups included school principals and educators in elementary and junior high schools that participated in the program in the areas of Attica (where Athens the capital of Greece is located) and Thessaloniki (the second largest city in Greece). To recruit participants initially, 24 of the participating elementary schools and 24 junior high schools in Attica as well as 12 elementary schools and 6 junior high schools in Thessaloniki were randomly selected. School principals were informed about the aims and the procedure of the study, in person and through an information letter. They were asked to inform all educators about the study aims and provide them the informative letter as well. To avoid selection bias, announcements were also posted in the educators' offices at each school, containing information about study aims and the procedure of focus groups. During recruitment many educators and few school principals reported time constraints. The focus groups were held in the school premises of one elementary and one junior high school in Attica and Thessaloniki respectively, which were randomly selected and were willing to host the specific activity.

Focus groups were conducted until saturation was reached (Krueger and Casey 2000). Twenty focus groups of 8-10 participants were held, during April - June 2013 in urban areas of low SES in Attica and Thessaloniki: 5 with educators of elementary school (n=40), 5 with school principals of elementary school

## Forum on Public Policy

(n=33), 5 with educators of junior high schools (n=36) and 5 with school principals of junior high schools (n=27). The total number of the participants was 136.

### *Focus group questions*

Discussion guides were developed for educators and school principals. It was developed during meetings of the multidisciplinary research team, consisting of a sociologist, a psychologist, a nutritionist, and public health experts. Their formulation was guided by relevant literature, research objectives and other topics related to the program's implementation. Moreover, the first focus group with each target (school principals and educators) served as pilot groups. For the following pilots, no structural changes were necessary and data were collected. For this reason the pilot focus groups were also included as actual data of the study. The themes covered in the focus group discussion were the following: (i) perceptions and attitudes regarding food insecurity, (ii) perceptions and attitudes regarding healthy nutrition, (iii) perceptions about the DIATROFI program and (iv) suggestions for other activities in the context of a school feeding program. All questions were open-ended. Participants were encouraged to share their personal opinions and experiences and the moderator was cautious not to direct the answers or show any kind of approval/disapproval of the participants' answers.

### *Data analysis*

Transcripts were analyzed independently by two researchers, using Krueger's "long table approach" method (Rabiee 2004; Krueger and Casey 2000), adjusted for use with a word processing software, rather than print copies. To enhance accuracy of the analysis, outcomes were checked for discrepancies by a third researcher. Lists of recurrent themes and subthemes were compared, revised and refined across reviewers ensuring the validity of the research (Altheide and Johnson 1994). Once indicative themes and subthemes were identified, the surrounding discussions from which they came from were re-considered, in order to ensure that statements were not taken out of context. Moreover, the group dynamics were taken into consideration (Morse & Field 1995; Krueger and Casey 2000). Major and minor responses, crucial for gaining insight on each theme, were identified as well.

## **Results**

### *Aspects of food insecurity in schools*

Food insecurity of students constitutes an everyday phenomenon in the participating schools, as indicated by school principals' and educators' testimonials:

*"Before the program began, we very often had incidents of fainting children, who of course didn't admit they were hungry."* (Educator, Elementary School)

*"Their head hurt due to malnutrition. The children weren't eating. They were unfed. Not only in the morning but also from the previous day. They used to come in and ask for painkillers, but it wasn't a question of painkillers. It was malnutrition."* (School Principal, Junior High School)

Various aspects of food insecurity in schools were identified by the participants that included reduced classroom attention and concentration, as well as school absenteeism among Roma students. The participants expressed their belief that these issues are associated with having food insecure children in schools.

*"I have in my mind a little girl who was underfed. She was weak. She didn't participate in class and seemed absentminded. It was due to lack of food."* (Educator, Elementary School)

## Forum on Public Policy

*“Unfed children are an issue. They are not focused. They can’t be when their constitution is lacking. They don’t pay attention and this may result in disarray in the classroom during lessons.”* (Educator, Junior High School)

*“Such is the culture of the Roma that when parents don’t have money to give to their child they keep him at home. They are ashamed of their children not having money at school. It is a social issue.”* (School Principal, Elementary School)

*“There are students who are repeatedly absent during the week. So, we asked them why they were absent. They told us that they didn’t have money for lunch and would rather sit at home. For the Roma it is essential to have money in their pocket.”* (School Principal, Junior High School)

Other associations identified by participants were aggressive and delinquent behaviors (expressed both by and towards food insecure students), the isolation of food insecure students in elementary schools, as well as emotional and mental impacts associated with experiencing food insecurity.

*“You could see children tripping other children who had snacks on purpose, to make their food fall down.”* (Educator, Elementary School)

*“This year we even had a case of food theft. In my office I even had an incident where students were blaming each other for stealing snacks from school bags.”* (School Principal, Junior High School)

*“How do we know who they are? You know, no student will come to you and say ‘I have nothing to eat.’ He will do it when he is at a very bad point. But you know from other things as well. Children who are isolated. They sit by themselves during breaks. They are not with the other kids.”* (Educator, Elementary School)

*“I had a girl who was basically alone. She had difficulties and was one of the kids who didn’t have snacks at school.”* (School Principal, Elementary School)

*“There is no doubt that kids who lack food also carry a huge weight in their souls. Inside of them underlies stigma and grievance.”* (School Principal, Elementary School)

*“They see their classmate who has. Even if he doesn’t flaunt it, this child who doesn’t have basic meals at home feels bad. He carries that inside.”* (Educator, Junior High School)

School principals and educators indicated that they have been trying to combat food insecurity in their schools through the implementation of personal initiatives, such as buying food for the children experiencing food insecurity.

*“As a school we have undertaken buying snacks every day for the students in need.”* (Educator, Junior High School)

*“Many times we bought our own snacks for children who we knew had problems. We did it discreetly so that their classmates wouldn’t find out.”* (School Principal, Junior High School)

### *Nutrition in schools: nutrition education and students’ nutritional habits*

Participants provided information on the quality of nutrition education in their respective schools. They indicated that in elementary schools healthy nutrition education is part of the curriculum at all levels, while in junior high schools it is part of the home economics course for first and second year students. Therefore, participating educators and school principals from junior high schools of other expertise reported their own lack of knowledge concerning the healthy nutrition of students.

*“We educators know about healthy nutrition from experience and are aware of the issue. From what we hear and read around.”* (Educator, Junior High School)

## Forum on Public Policy

*“Home economics teachers have special knowledge on this subject. The rest of us only know the basics.”* (Educator, Junior High School)

Participating educators and school principals mentioned the important role of the family on the nutrition of students in elementary schools in comparison with their teaching on nutrition education. Therefore, they considered children’s nutrition to be dependent on their parents and home life and especially on their mothers. However, participants differed in their degree of intervention; some consulted mothers on the issue of nutrition in the school, while others chose not to.

*“A student’s correct diet depends on their home. Whatever you do at school, if the child goes to a home with different role models, if his mother gives him chips for a snack, there can be no result.”* (Educator, Elementary School)

*“Of course teachings in school are essential, so we educators insist on them. I myself inform the mothers on ideal snacks.”*(Educator, Elementary School)

*“I don’t interfere with the parents. Lessons are my jurisdiction.”*(Educator, Elementary School)

In junior high schools, students were thought of by participants to be more autonomous, having more independence when it came to selecting foods.

*“High school students are opinionated. They will decide what they will and will not eat. Some eat a healthy diet, others are against it since a healthy diet is considered a rule and teenagers are rebels.”* (School Principal, Junior High School).

Additionally, participating educators and school principals identified economic circumstance as having an effect on nutrition in schools. They posited that the recession is likely to increase the consumption of unhealthy foods that are both filling and cheap.

*“The economic crisis leads to cheap options e.g. 3 packed croissants cost 5 euro, which means three days of unsuitable snacks.”* (School Principal, Elementary School)

*“Snacks of bad quality are the result of the economic recession”* (Educator, Junior High School)

Exacerbating this issue, school canteens were described by participants as providing unhealthy options.

*“Canteens sell unsuitable products to gain profit. Croissants, popsicles etc.”*(School Principal, Elementary School).

### *School principals’ and educators’ perceptions of the program*

Participating educators and school principals indicated that they believed the DIATROFI Program worked to combat food insecurity in schools, as well as in students’ homes. They explained that the provision of one free, healthy meal every day relieved some of the financial burden for participating students’ families and constituted social care.

*“From the moment the Program began, and children were eating, fainting incidents ceased to exist.”* (Educator, Elementary School)

*“First of all there was a reduction on painkillers. We no more have cases of students with headaches and upset stomachs.”* (School Principal, Junior High School)

*“It is an essential social care for those who have difficulties. It helps both children and their families.”*(Educator, Junior High School)

## Forum on Public Policy

*“Relief for the parent who doesn’t have anything to give his child. It supports these people.”*  
(Educator, Junior High School)

Additionally, participants indicated that the distribution of meals to all students without exception reduced the social stigmatization of students in need and enhanced their participation in the Program.

*“Initially, some students didn’t accept it. They didn’t participate because their parents thought the program was only for those in financially difficulty. When they understood it was for everyone there were no more such prejudice.”*(School Principal, Elementary School)

*“Students are not stigmatized for not having snacks. They eat what their classmates eat.”* (School Principal, Elementary School)

*“Now all students begin from the same point, everyone is entitled to the same meal. As a result, there are not distinctions from either side.”* (Educator, Junior High School)

Furthermore, participants indicated that the Program enriched the nutrition education in schools. It complemented the existing nutrition education in elementary schools because students were able to put the lessons they learned in school into practice. Teachers of home economics in junior high schools indicated that the Program enhanced adolescents’ understanding of teachings on healthy nutrition as well.

*“For us it is a supplementary education tool, because when we tell them in a class about calcium and milk, now with the meals it becomes a daily action.”* (Educator, Elementary School)

*“In the Home Economics curriculum we have the food combinations and the meals confirm what we say. Many times I start the lesson about the value of black cereal products”* (Home Economics Teacher, Junior High School)

School principals and educators indicated the positive aspects of the Program in relation to the students’ consumption of healthy foods. This was largely because of peer influence (students who saw their friends eating the meals were likely to eat the meals themselves), increased knowledge of and familiarization with healthy foods, and development of healthy eating habits through the daily consumption of nutritious meals.

*“They eat together the same thing. They influence each other. ‘My friend eats it, so why shouldn’t I?’ they say.”* (Educator, Elementary School)

*“They see each other and they get carried away.”* (Educator, Junior High School)

*“Experientially they accept healthy nutrition. They learn about it.”* (Educator, Elementary School)

*“Healthy nutrition has now become an experience.”* (School Principal, Junior High School)

*“You see students who before didn’t even touch fruit or had never eaten black bread, now becoming familiar with them and those who reacted before, now eating them pleasantly.”* (Educator, Elementary School)

*“They have become more and more familiar with fruit and milk without cocoa.”* (School Principal, Junior High School)

*“Healthy nutrition is becoming a habit because of everyday offering.”* (Educator, Elementary School)

*“They get used to healthy foods without even realizing it.”* (School Principal, Junior High School)

Another observation of educators was that the attention and concentration of participating students improved, as did school attendance primarily for Roma students in Elementary school.

*“We had two girls in elementary school who were malnourished. Now we see red cheeks and better grades.”* (Educators, Elementary School)

*“There is a typical case. It’s a girl with a very particular family situation. She used to come to school cadaverous and many days she didn’t even show up. If you only saw how much this girl*

## Forum on Public Policy

*changed this year... How she socializes with the other children. She feels better and of course her grades are much better.*” (Educator, Junior High School)

*“We saw Roma students who we hadn’t seen for weeks. They came because of the food. Their parents sent them.”* (Educator, Elementary School)

*“Dropping out was reduced in the case of the Roma. Now, with the Program they attend.”* (School Principal, Junior High School)

Participants also suggested that the DIATROFI Program improved pedagogical work. They reported an improvement in school climate, explaining that the program moderated aggressive behaviors, and at the same time enhanced collegiality, solidarity and students’ feelings of happiness.

*“We no more have cases of students pushing others to make them drop their lunch.”* (Educator, Elementary School)

*“They don’t steal each other’s meals anymore.”* (School Principal, Junior High School)

*“All the children sit together and eat. They form circles, they make groups and it looks like a family eating together. Like a family eating at the same table.”*(Educator, Junior High School)

*“There is solidarity among the students. You can see them sharing. If a child doesn’t want milk, he gives it to his friend who he knows likes it.”* (School Principal, Elementary School)

*“The children show solidarity and know who has and who hasn’t a problem. This is cultivated through the meals.”* (School Principal, Junior High School)

*“They show happiness, ‘Oh! The truck is here!,’ they expect it.”* (Educator, Junior High School)

*“They ask a lot about the menu. They are interested in it, it motivates them.”* (Educator, Elementary School)

*“They like distribution time the best. Their face lights up! They like it a lot.”* (School Principal, Junior High School)

*“They especially went crazy with the yogurt and honey!* (School Principal, Elementary School)

Concerning the pedagogical aspects of the Program, participating faculty also said that it cultivated discipline and self-organization among the students because of the responsibility allotted to them in the distribution of the daily meals.

*“The children have gotten in line, they know every day who will bring the meal and they take it with discipline. At first, there was chaos, they pushed each other, by now they behave.”* (Educator, Elementary School)

*“The distribution is a mode of behavioral education because there is a division of labor and roles. That is how they learn.”* (Educator, Junior High School)

The Program was also described as a means of improvement of parent-school relationships.

*“Through its participation to the Program the school shows that it understands the problems of the families and contributes actively and effectively. As a result, parents feel safe and trust us.”* (School Principal, Elementary School)

*“The Program brought the parents closer to the school.”* (School Principal, Junior High School)

### *School principals’ and educators’ proposals on the Program’s improvement*

Participants suggested that, given the perceived pedagogical value of the Program, it should become policy and should be implemented in all public schools across the country regardless of the economic crisis.

## Forum on Public Policy

*“Food aid is a paramount for every school. This is something that should have been in place already. Again, food aid for our schools is a basic, fundamental element.”* (Educator, Elementary School)

*“I believe that it should be implemented and already exist in every school because it is an important facet of child education. The children respect, learn and appreciate the food. Healthy eating habits are developed, to eat the same meal with his or her friends and to share.”* (School Principal, Junior High School)

Participants’ proposals for the improved promotion of healthy nutrition through the DIATROFI Program included stricter implementation of the existing legal framework concerning the permitted distribution of products in school canteens, more parental collaboration, and nutrition education for educators, school principals, parents and students.

*“School canteens need to cut down on unhealthy foods. There is no other way. This way, all students will eat the Program’s healthy meals. They won’t be tempted.”* (School Principal, Junior High School).

*“In order for the promotion of healthy foods to be more effective, the school must collaborate with the parents. That is, simultaneous awareness of the parents towards this direction.”* (Educator, Elementary School).

*“School and actions taken in school are not enough if at home opposite ones occur.”* (Educator, Junior High School)

Recommendations for nutrition education included training and resources for educators and school principals, further resources for educators to enhance their teaching on healthy nutrition, general education for parents on the nutritional value of the distributed meals, and experiential education for the students.

*“Anything that strengthens our knowledge as far as healthy nutrition is concerned, is well-received. You could organize seminars for educators so that they may convey their knowledge to their students...And printed material, a small booklet would help us.”* (Educator, Junior High School)

*“It would be good if in the Program’s framework you shared visual material that we would use with the students. We are constantly searching for such materials which we use in our lessons”* (Educator, Elementary School)

*“Visual material would be useful for high school students. We would use it in the healthy nutrition unit.”* (Home Economics Teacher, Junior High School)

*“You could organize lectures for the parents for healthy nutrition and give them informational material for the healthy nutritional value of the meals that you give to their children. They should know and they should learn.”* (School Principal, Junior High School)

*“For the students it is very important that you do some special initiative in the Program’s framework. Firstly, they should hear from you too about healthy nutrition, not only from us who represent ‘the rules.’ Experiential education is more effective on children. Cooking events, for example.”* (School Principal, Elementary School)

## Discussion

To the best of our knowledge, this is the first qualitative study that explores the social aspects and pedagogical potential of a school-based healthy nutrition intervention in disadvantaged areas of a high income country, currently undergoing a severe economic crisis, as they are realized by educators and school principals who have experienced its implementation. The results are interesting and they could provide

## Forum on Public Policy

insight for public health efforts on child malnutrition and childhood obesity on populations of countries affected by the economic recession and experiencing socioeconomic disparities. In these settings, food insecurity, which constitutes an everyday phenomenon and a reasonable consequence of the acute economic crisis in schools located in low SES areas in the case of Greece, was perceived by the majority of the educators and school principals as a predictor of impaired academic performance. They reported reduced classroom attention and concentration from food insecure children, a fact that is supported by previous research indicating the association of food insecurity and cognition (Belot and James 2011). However, differences on the level of association depending on the type of food insecurity have been observed. Thus, less severe forms of food insecurity like fasting and malnutrition indicate lower or even no association with academic performances (Joyti et al. 2005; Ashiabi 2005). Indeed, the incidents mentioned by participants were about food insecure children experiencing severe forms of food insecurity, as it was understood from their testimonials' analysis.

School absenteeism was also reported as an aspect of food insecurity by participants in the focus groups, a fact that is evident in other studies as well (WFP 2001; Jukes et al. 2008). However, participants' testimonials refer basically to Roma students and their cultural background. This might be relevant to the literature indicating that indeed the rates of early leaving from education in Greece were quite low (Rouseas and Vretakou 2006). However, rates of school absenteeism are not available and still the effects of the ongoing economic recession on the issue haven't been documented in detail (EUROSTAT 2014). Participants argued also on the poor socio-emotional development of food insecure students referring to emotional and mental impacts, such as social isolation and aggressive behaviors. Research indicates that food insecurity among students is associated with higher stress level (Dunifon and Kowaleski 2003), internalizing behaviors, and poor psychosocial functioning (Reid 2001; Alaimo et al. 2001). Moreover, food insecurity is linked to school suspension among children aged 6 to 17 years old, whereas in adolescent students aged 15 to 16 it is associated with depression and suicidal symptoms (Alaimo et al. 2001; Alaimo et al. 2002). Although there is a large body of literature supporting these arguments, there is no direct link between food insecurity and students' socio-emotional development, since individual and family factors are mediating: children's health status (Melchior et al. 2007), mothers' mental health (Whitaker et al. 2006), family structure and parenting style (Ashiabi and O' Neil 2007).

As documented in the literature, family has a dominant role in the nurturing of the children. Attitudes of mothers, in particular as the "nutritional gatekeepers" of the family, is of great importance since in the majority of the cultural settings, they tend to spend more time taking care of their children and their feeding needs (Adamo and Brett 2014). Indeed, the results of the study indicate the significant role of family in general and mothers especially in the students' nutrition in school. Interestingly enough, some educators in elementary schools consult the parents of their students on healthy nutrition. However, these actions are not implemented systematically or universally. Therefore, they might be very much dependent on the educational approach of each teacher and probably on his level of sensitization on health nutrition. The observed lack of such an approach in junior high schools as well as the observed adolescent's tendency to consume more unhealthy foods than elementary school students, can be justified by the very nature of adolescence and the well stated factors in literature related to adolescents' barriers on healthy nutrition, such as increased independence, influence of external factors including peer interactions, food appeal and convenience and marketing (Stang and Story 2005; St George 2012).

School principals and educators mentioned that the families' financial restraints during the period of economic recession led to an increase of the consumption of unhealthy foods in the schools. The consumed foods are cheaper and energy-dense, a fact that indicates increase in sugar and intake of saturated fats. Evidence from previous research suggests that this kind of nutrition is associated with the experienced household food insecurity (Darmon and Drewnowski 2008) and also that such ingredients have negative effects on the socio-emotional development of children (Joyti et al. 2005). Therefore, compromised dietary quality of the food insecure households can also be an explanation of the observed in the present study,

## Forum on Public Policy

“tensions” in socio- emotional condition of food insecure students during the period of economic crisis. According to previous studies another barrier of healthy eating at schools is the unhealthy food choices offered in the school canteens (Jaime and Lock 2009; Story et al. 2008). Indeed, results of this study suggest that the food that is sold in the schools is associated with the students’ level of healthy foods’ consumption. In tune with that, in the western world strict policies have been mandated by governments for regulating the quality of food offered at schools (Williams et al. 2015).

Based on participants’ empirical evidence, the DIATROFI Program has had positive impact in food insecure children, in the sense that incidents of food insecurity are no longer present in the participating schools, while students with higher levels of food insecurity improved their attention and concentration in the classroom. Moreover, Roma food insecure students have shown an increase their school attendance. These findings coincide with studies stating the efficiency of school feeding programs in combating food insecurity (DePolt et al. 2009; Ratcliffe et al. 211), as well as their positive impact on the socio-emotional and cognitive development of children (Adelman et al. 2008) and their school attendance (Jukes et al. 2008). Systematic reviews (Grantham-MacGregow 2005 & Kristjansson et al. 2007) stressed out the fact that although studies indicate the association between school feeding programs and improvement of academic performances, yet, there is not enough evidence and, therefore, there is a need for long term and more systematic research evidence. However, it could still be argued that the observed improvement in the attention and concentration of students with higher levels of food insecurity in the particular study implies better learning efficiency while in school (Adrogué and Orlicki 2013). Thus, school feeding programs in developed countries undergoing economic crisis set a base to the cognitive development of students experiencing severe types of food insecurity.

One of the most crucial issues in school feeding programs is student participation. It came as no surprise that low participation of children in need has been observed in relevant programs, due to social prejudice and stigmatization associated with the revelation of the families’ socioeconomic status in case of their involvement (Bailey-Davis et al. 2013; Dunifon and Kowaleski-Jones 2003). The issue of social stigma linked with the participation of families and children in food aid programs is present in the literature (Gundersen 2012; Hameling et. al. 2002). Arguments on its decrease propose universal distribution of free of charge meals (USDA 2002) and a holistic orientation incorporating a cultural sensitive approach, active engagement of the community, community kitchen, urban agriculture, education on sustainable food stages, education on financial management skills (Gundersen 2012; Vahabi and Danda 2013). The DIATROFI Program overcomes this specific barrier through the distribution of the free, mid-day healthy meals to all the students of the participating schools, without exceptions. Participants of the study claimed that the universal distribution of the free, healthy mid-day meals not only prevails over students’ nonparticipation but also contributes to the decrease of social discrimination. Thus, school feeding programs through meals’ universal free of charge distribution safeguard human rights and dignity of those in need.

Participants stated the positive effects of the program concerning the healthy nutrition of students, mainly due to collective consumption of the meals and peer influence. Indeed, younger elementary school children are vulnerable to the influence of peers (Lan et al. 2014), while in adolescents, research evidence indicates the strong social norms operating in the peer environment and its great influence to the eating behavior of teenagers (Story et al. 2002). Based on the participants’ arguments on students’ actual consumption of the healthy food choices meals’, it could be assumed that the collective consumption of the program’s mid-day meals enhances positive peer influence. However, research evidence indicates that there might be a negative impact on healthy food consumption in schools, since it is planned, organized and imposed to students by school authority, and thus taking an institutional character, generating a sense of controlling (Warde 1997). An explanation to the contradiction of the present study’s evidence could be the positive impact of students’ participation in the distribution of the meals that occurs in the program. The important role of student involvement and ownership in education is well cited, since the activities that stimulate real students’ participation generate “natural” commitment, learning and discipline (Dewey 2001). Justifying these

## Forum on Public Policy

arguments, the present study indicates that indeed student participation in meals' distribution lead to self-organization, discipline, while cultivating healthy eating habits. Moreover, students' participation in meals' distribution as well as collective consumption enhance collegiality in the schools, reduction of aggressive behaviors and happiness of students. Concerning collegiality, the inevitable positive impact of school feeding programs on students bonding is rather fundamental, since improved relations among students have various social and educational outcomes of students (O' Farrell and Morisson 2003). The reduction of aggressive behaviors, also contributes to the school climate and in fact, according to USDA (2013) school feeding programs decrease the rates of aggressive behavior among students. With regards to happiness, findings from the present research corroborated previous evidence according to which shared experiences are more enjoyable than solitary ones (Caprariello and Reis 2013; Bhattacharjee and Mogilner 2014).

Furthermore, educators and school principals claimed students' familiarization with healthy foods, such as fruits, whole meal bread and white milk without cacao and their habitual consumption. It is important to realize that acceptance of food it requires to be presented multiple times (Filder et al. 2013), a condition that is achieved through the everyday provision of the program's healthy mid-day meals, which, also, cultivates experiential knowledge of healthy food choices and transforms healthy eating into a habit that once developed, operates automatically at a lower level of cognitive processing (Aarts and Dijksterhuis 2000). Additionally, elementary school educators and teachers of home economics in 1<sup>st</sup> and 2<sup>nd</sup> grade of junior high reported that the healthy mid-day meals compliment the curriculum education on healthy nutrition, transforming "theory into practice" and thus enhance the effectiveness of their teachings.. According to Osowski et al. (2012), educators' role and the way of their interaction with the students and the school meals influence the learning on healthy nutrition. In their study three types of educators are observed: (1) the sociable teacher, having a high level of interaction, (2) the educating teacher, who emphasizes on the education of pupils and (3) the evasive teacher with a low level of interaction. A possible limitation of the present analysis is the omission of an analytical presentation of educators' attitudes towards the school feeding program. Taking into account the importance and the complexity of the issue, the specific observation leads to the future expansion on the current study and the investigation of educators' and school principals' attitudes towards the DIATROFI Program. Nevertheless, what can be argued at that stage is that school principals' and educators' coordination and supervision of the everyday operation of the program is of crucial importance. Higher level of involvement was observed in the elementary school staff than in junior high school.

Participants in the focus groups stated that the program enhanced the parent-school relationship, because by responding to the social needs of the local community, it generates feelings of trust for the parents. The relationship that develops between parents and schools as well as between community and schools are critical for the socio-emotional and cognitive development of the children (Christenson and Sheridan, 2001) and school feeding programs provide a positive path for their cultivation (Rossi et al. 2008). Based on the pedagogical value of the DIATROFI Program, participants pointed out the need for it to become a policy and to be implemented in all public schools across the country regardless of the regions' socioeconomic status. Besides, school feeding programs are regarded as an effective policy for reducing food insecurity and social disparities as well as promoting healthy nutrition both in developed and developing countries (WFP 2013; Bonsman et al. 2014). Furthermore, educators and school principals emphasize the need for the elimination of the competitive products provided in school canteens through stricter implementation of the current regulation. Moreover, they provided recommendations for additional nutrition education in the framework of the DIATROFI Program including resources and training for educators and school principals, education for parents on the nutritional value of the distributed meals, and experiential education for students. Based on the literature, the most effective intervention programs aiming at improving students' dietary habits have multiple components, including various methods of delivering nutritional education, such as pamphlets and other materials that enhance parent and school staff support and active participation (Bush et al. 2013). Moreover, experiential strategies on the promotion of healthy nutrition for elementary school children, proved to have the largest effects on the promotion of healthy nutrition, according to a

## Forum on Public Policy

meta-analysis on teaching approaches that promote healthy eating in elementary school students (Dudley et al. 2015).

### Conclusion

The reported results enables the better understanding of school feeding programs' multiplication effects, while shading light on the Food Aid and Promotion of Healthy Nutrition Program, DIATROFI. The Program is implemented in schools located in low SES areas of a country undergoing severe economic crisis. So far, the emphasis has been placed on the school feeding programs' effects on food insecurity, healthy nutrition, socio-emotional and cognitive development of the students. This study indicates that the pedagogical effects of these programs is another important aspect that needs to be further evaluated, which includes specific procedures and interactions among students, educators and parents involvement in enhancing the school climate and improving students' healthy eating habits and development.

The qualitative methodology employed in the study does not permit further specification and quantification of the findings. It does, however, provide valuable insight in the design and implementation of school feeding programs that need to be socially sensitive and engaging. Strengthening students' participation in school feeding programs constitutes a crucial element for public health efforts on child health in general and on food security in particular. Universal provision of free, healthy meals and active participation of students in the daily meal distribution are rather promising practices, ensuring social justice and enhancing positive school involvement for students living in deprived areas. The effectiveness of school feeding programs is also affected by the engagement of the parents and educators. Distribution of educational material, training sessions as well as the meal itself, support the efforts in the promotion of healthy nutrition, as well as overcoming social and economic barriers that come with it.

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