



Bachelor's Degree in Nutritional Sciences

**Local interventions to prevent obesity in the WHO European Region – a briefing
review**

Research work

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Abstract: Local interventions in the WHO European Region – a briefing review

Introduction: The increased prevalence of overweight and especially obesity affects the entire population in some countries regardless of age, sex and ethnicity, and has become a global public health problem. Following the *WHO European Charter on counteracting Obesity* and the EC *White Paper “A strategy for Europe on Nutrition, overweight and Obesity related health issues”*, highlighting the role of local authorities which have the great potential in creating the environments and opportunities for healthy living it was clear that action should be taken at both micro and macro levels and in different settings. Therefore, governments from the European countries have created, developed and implemented several obesity prevention interventions/programmes at national, regional and local levels.

Objective: The aim of this review was to find and subsequently gather and interpret information regarding interventions/programmes at local or municipal level in the WHO European Region, which are intended to prevent overweight and/or obesity in children, adolescents, adults and elderly through the promotion of physical activity and change of food habits.

Methodology: The search included scientific papers and grey literature. The scientific search engine was focused on PubMed, Medline and the World Health Organization, while grey literature was found using the Google browser.

Results: From the 659 papers and websites found, 62 papers and websites (from 2006 to 2011) were included in this review comprising 23 interventions/programmes. 10 were community-based, 6 community- and school-based 6 school-based, and 1 family-based community interventions. Of the 23 interventions/programmes included, 17 related to both improving/changing nutrition habits and promotion of physical activity (73,9%); 5 related only to promotion of physical activity (21,7%); and 1 related only to the improve/change of nutrition habits (4,3%).

Discussion: This brief review revealed that most of the interventions and programmes that promote physical activity, healthy food habits and environmental changes are

effective at all levels (community, school and family) and may subsequently prevent and counteract overweight or obesity.

Conclusions: Overall 60,8% of the programmes/interventions found proved to be effective and successful in preventing and/or reducing overweight and/or obesity and had improvement of food habits and physical activity levels on the target groups mentioned at the local or municipality level in the WHO European Region.

Keywords: community interventions; local level; Europe; obesity prevention; promotion physical activity; childhood obesity; municipality level; children; adolescents; adults; elderly; systematic review.

Acronyms:

BMI – Body Mass Index

COIP – Community-oriented intervention programme

EPODE – European Network

IOTF/IASO– International Obesity Task Force

PA – Physical Activity

PE – Physical Education

PHI – Public Health Institute of Iceland

USA – United States of America

WHO – World Health Organization

Introduction

It's well known that the prevalence and incidence of overweight and even obesity is increasing and affecting not only adult men and women but also children and adolescents. Also affects both developed and developing countries of all socio-economic groups, irrespective of age, sex or ethnicity (Kosti & Panagiotakos, 2006).

As stated in the “*Global Status Report on Non-Communicable Diseases 2010*” document, the prevalence of obesity nearly doubled between 1980 and 2008 in worldwide (Alwan et al., 2010). The global average reflects a wide range of prevalence levels, with the prevalence of overweight in Africa and Asia averaging well below 10% and in the Americas and Europe above 20% (Kosti & Panagiotakos, 2006).

According to World Health Organization, 1,5 billion adults, 20 and older, were overweight and of these over 200 million men and nearly 300 million women were obese. Globally, more than one in ten of the world's adult population was obese (WHO, 2011).

In 2010, around 43 million children under five were overweight. Close to 35 million overweight children are living in developing countries and 8 million in developed countries (WHO, 2011). According to the International Obesity Task Force, the childhood obesity epidemic is affecting 1 in 10 children being this overweight and making a total of 155 million (IOTF, 2010).

According to the “*Challenge of obesity in the WHO European Region and the strategies for response (2006)*” document, countries that have carried out measurements (46 of 53 countries in the European Region), the prevalence of overweight in the WHO European Region ranged between 32% (Uzbekistan) and 79% (Albania) in men and between 28% (Turkmenistan) and 78% (Albania) in women. The prevalence of obesity ranged from 5% (Uzbekistan) to 23% (Albania) among men and between 7% (Uzbekistan) and 36% (Albania) among women (F. Branca, Nikogosian, & Lobstein, 2007).

In the European Region, over 20% of school-age children are overweight or obese, 27 member states which means that over 12 million children are either overweight or obese (IASO, 2011). Preliminary results of the first round of the *European Childhood Obesity Surveillance Initiative* (COSI) from WHO European Region, indicate that on average 24% of the children aged 6-9 years old are overweight or obese (World Health Organization, 2011), with Portugal (8,9%) (Rito, Carvalho, Ramos, & Paixão, 2010) and Italy (12,3%) presents the highest prevalence of obesity (Rito et al., n.d.).

Since the prevalence of overweight and obesity is increasing each year and has become an international public health priority, there's a demand to create and implement effective interventions to prevent this global trend (Briançon et al., 2010). The importance of effective interventions to reduce obesity and related health risks have increased in the recent decades due to obesity epidemic proportions (Kumanyika et al., 2008) These interventions must have the support of governments in order to be possible to develop and apply national policies and programmes in this area (Lobstein, Baur, & Uauy, 2004).

Moreover, health authorities have proposed a series of population-based strategies to prevent obesity which emphasis on changing the environment contexts for healthful diet and physical activity promotion through life course (Kumanyika et al., 2008). Given that, an unhealthy environment is an important contributor to obesity epidemic, reversing the trend will require policy actions at all levels of government (Adkins et al., 2009).

Following the *WHO European Charter on counteracting Obesity* and the EC *White Paper "A strategy for Europe on Nutrition, overweight and Obesity related health issues"*, is essential to build partnerships between all stakeholders across all levels (national, sub-national and local), highlighting the role of local authorities which have the great potential in creating the environments and opportunities for healthy living. Action should be taken at both micro and macro levels and in different setting such as home and families, communities, schools, kindergartens and workplaces. Therefore, governments from the European countries have created, developed and implemented, several obesity prevention interventions/programmes at national, regional and local

levels (World Health Organization, 2006; Commission of the European Communities, 2007)

Most of the countries have implemented national policies and strategies to promote health of the population focused in obesity prevention. These national policies can create a supportive environment, regional policies that can facilitate pooling of resources, whereas local tailoring of interventions results in more effective targeted interventions. Global (intergovernmental) support for obesity prevention and lifestyle promotion can help to address transnational environmental factors (Thow, Armstrong, Candeias, Randby, & Xuereb, 2010)

The following European national strategies are example of this: in England there is the “*Healthy weight, Healthy Lives: a cross-government strategy*” (Cross-Government Obesity Unit, Department of Health and Department of Children, Schools and Families, 2008); in France the “*Programme National Nutrition Santé (PNNS)*” (Manger Bouger, n.d.); in Italy the “*Guadagnare Salute*” (Guadagnare salute, n.d.); in Switzerland the “*Youth + Sport* and the “*Youth+sport kids*”; and in Portugal the “*Plataforma contra Obesidade*” (Plataforma Contra a Obesidade - Direcção Geral da Saúde, n.d.).

Experience in several countries has shown that successful obesity prevention and behaviour change can be achieved through a combination of population-based measures, implemented both at the national level and as part of local ‘settings-based’ approaches, in particular, school- and community-based programmes (Thow et al., 2010). The community involvement is assumed as a real strategic priority in fighting obesity since it seeks social change by encouraging an increase in healthy behaviours, reducing the risk to health. The orientation of these strategies should take count with a national policy to promote health through healthy food habits and physical activity to guide the local action reaching the population in the different community centre’s.

This interventions/programmes can be **community-based interventions** (Rudolf et al., 2006; de Silva-Sanigorski, Bolton, et al., 2010; Vera Verbestel et al., 2011), **school-based interventions** (Martens, van Assema, Paulussen, Schaalma, & Brug, 2006; Singh et al., 2006; Howerton et al., 2007; De Cocker, De Bourdeaudhuij,

Brown, & Cardon, 2008) and **family-based interventions** (Sacher et al., 2010; Steele et al., 2011; Watson et al., 2011) normally focused on physical activity or change/improve of food habits or both in order to, encourage individuals to modify their lifestyle, to modify the obesogenic environment, or to develop legislative changes (Kuipers, 2010).

The school-based interventions offer the opportunity to reach a large and a diverse population of children and adolescents in a single setting. Nevertheless, this kind of interventions allows targeting young individuals who are developing attitudes, beliefs and behavioural habits. Since, this kind of interventions takes place on schools, its possible to involve also the community through volunteers, parents and children and then they can come together to tackle childhood obesity (Bopp & Fallon, 2008).

Increasing evidence shows that the most successful interventions are multicomponent, adapted to the local context, using the existing local structures of a community, and involving the participants in the planning and implementation stages (Borys et al., 2011). Using this sort of approach and involving multiple partners contributes to community empowerment and affords the opportunity to reach a large number of people (Bopp & Fallon, 2008).

The aim of this briefing review is to search community programmes and/or interventions, which the main focus is to prevent of obesity/overweight among children, adolescents, adults and elderly through the promotion of physical activity and change of food habits at local or municipality level in the WHO European Region.

Methodology

Literature search for this review included scientific papers and grey literature. The scientific search included two main electronic databases (PubMed and Medline) and the World Health Organization documents while grey literature was found using Google from 2006 onwards. Scientific papers were all in English language where grey literature included websites in English, Spanish, Dutch, French, Greek, German, Romanian and Icelandic that were further translated. The following keywords were search and combined: community interventions; local level; WHO European Region; obesity prevention; promotion physical activity; childhood obesity; municipality level; children; adolescents; adults; elderly and systematic review.

The inclusion criteria in this briefing review comprised: interventions/programmes that: (1) were carried out in the WHO European Region; (2) were developed at local or municipality level in different settings (e.g. school; community; family environment); (3) targeted children, adolescents, adults or elderly; (4) aimed to prevent of overweight and obesity through lifestyle interventions (lifestyle interventions were defined to those that: promote healthy eating, reduce sedentary behaviours, promote physical activity, nutritional education and change of physical activity behaviours).

The following exclusion criteria in the present review were applied: (1) interventions/programmes that were conducted outside the WHO European Region; (2) interventions/programmes that were not designed for primary prevention (such as genetic syndromes, cancer, eating disorders or other chronic diseases); (3) programmes targeting new-borns and pregnant women.

Results

The initial research conducted found 659 publications (286 scientific papers and 373 websites). After completely reviewing, 597 publications were excluded because they did not meet one or more of the inclusion criteria. Almost all of the excluded publications (n=486) were developed outside of the WHO European Region. Subsequently 111 papers and websites were excluded because they weren't developed at the regional or municipality level. Data included 62 scientific papers and websites comprising 23 interventions/programmes (**Figure 1**).

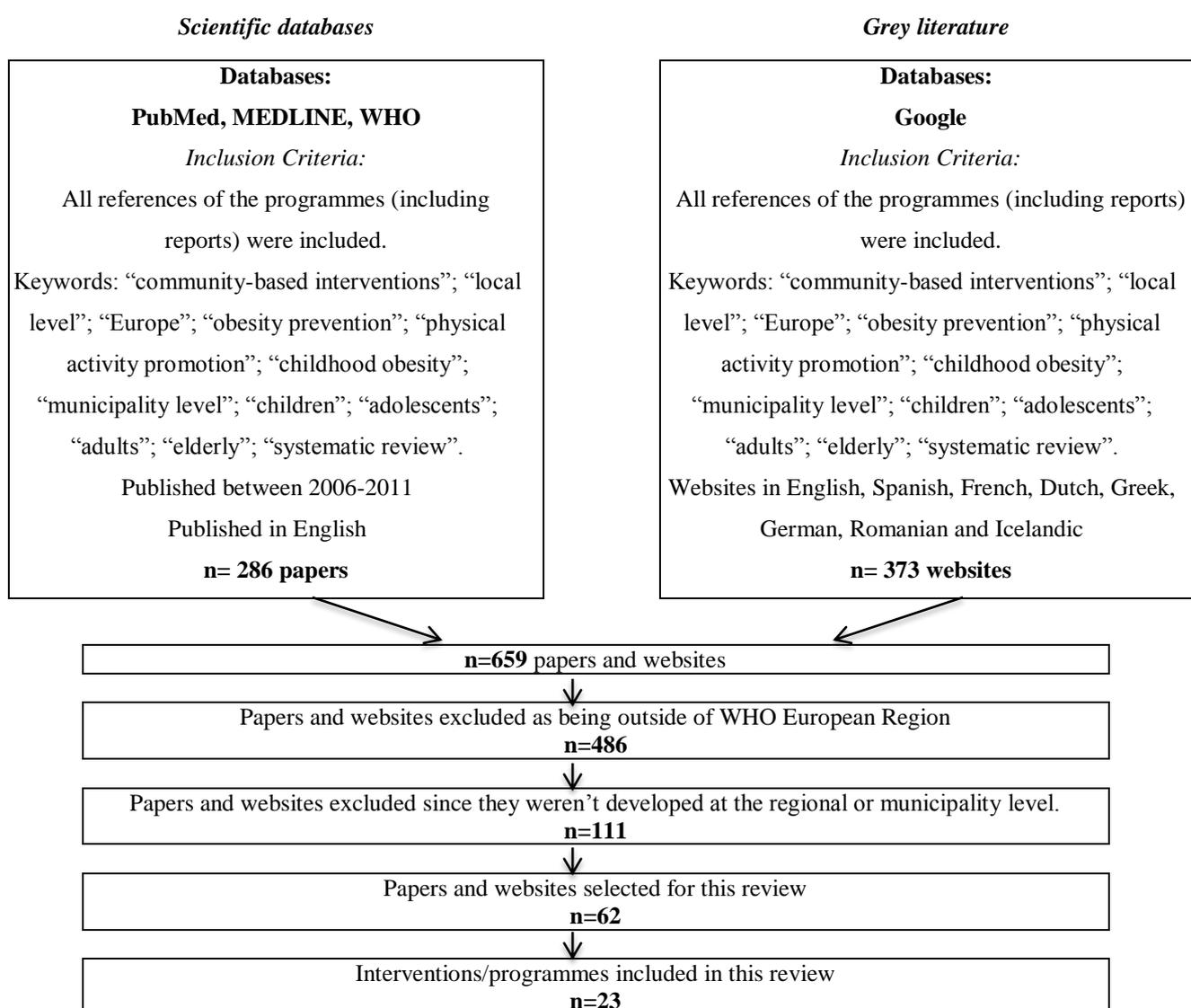


Figure 1: Flow chart of the selection process

The 23 interventions/programmes included in the present review were implemented in the WHO European Region from 2006-2011 and were grouped according to the type of intervention – community-based (n=10) (43,5%) (**Table 1**), school-based (n=6) (26,1%) (**Table 2**) school- and community based (n=6) (26,1%) (**Table 3**) and family-based community interventions (n=1) (4,3%) (**Table 4**). In each table it is presented the interventions/programmes characteristics such as: name, study location in the WHO European Region and in the rest of the world, target group, design of the intervention, the main objectives, the description and intervention outcomes (**Annex 1**).

Most of the interventions/programmes were carried out in the United Kingdom (interventions n°1; n°4; n°12; n°23), Spain (interventions n°3; n°5; n°21) and Netherlands (interventions n°8; n°11; n°14), and overall 380 municipalities participated. These programmes targeted both children and adolescents (26,08%), or only children (56,54%), or only adolescents (4,34%). Two were aimed to adults/elderly (8,69%). Nevertheless, in the majority of the interventions/programmes for children and/or adolescents, parents or family members were always involved (78,26%).

Of the 23 interventions/programmes: 17 related to both improving/changing nutrition habits and promotion of physical activity (73,9%); 5 related only to promotion of physical activity (21,7%); and 1 related only to the improve/change of nutrition habits (4,3%).

14 interventions/programmes used environmental modifications (60,89%) (improving physical facilities or improving the availability and accessibility of healthy foods in different settings). Another intervention characteristic found was the training of professionals (26,08%), that was conducted in 6 programmes. All of the programmes included healthy lifestyle education through a set of activities mainly (e.g. cooking classes, workshops, debates, distribution of materials) given by group sessions (86,95%) and/or counselling sessions (69,56%).

On the interventions included in this review not all showed outcomes, since 9 of these are still on-going or the results/conclusions weren't officially published or known. All of the programmes that showed their outcomes (n=14; 60,8%) proved to be

effective and successful in the prevention and/or reducing overweight and/or obesity and the improvement of food habits and physical activity levels on the target groups mentioned at local or municipality level in the WHO European Region.

Discussion

Unhealthy lifestyles habits linked to unhealthy food habits and lack of physical activity are the most commonly determinants associated with the development of overweight and obesity in children, adolescents, adults and elderly.

The obesity epidemic affects not only the WHO European Region, but also other regions such as North America, Australia and South America (WHO, 2011). Consequently, interventions/programmes at local level were created and implemented in order to, prevent this disease by promoting healthy eating and physical activity. In fact, when the search begun the large majority of the interventions/programmes found, were in another regions than the WHO European Region and for the purpose of this review they were excluded.

The aim of this briefing review was to find and subsequently gather and interpret information regarding interventions/programmes at local or municipal level in the WHO European Region, which are intended to prevent overweight and/or obesity in children, adolescents, adults and elderly through the promotion of physical activity and improve/change of food habits.

According to the 23 interventions/programmes found in this review, fourteen had positive results in relation to: (1) changing or improving food habits; and/or (2) improving levels of physical activity; and/or (3) changing the environment, where all were intended to change and/or improve lifestyles and may therefore prevent overweight and obesity in children, adolescents, adults or elderly. Not all the interventions/programmes have results or conclusions, since they are still on-going and their impact and assessments were not made, and therefore were not published scientifically or unknown (PR, Relatii Publice PRAIS, 2008; Borys et al., 2011; S De Henauw et al., 2011; Nutrition Enfant Aquitaine, n.d.).

Of the fourteen interventions/programmes that were effective there were: (1) improvements in body composition (including: BMI, waist circumference, sum skinfold thickness, %body fat) (Rudolf et al., 2006; Simon et al., 2006; Singh, Chin A Paw, Brug, & van Mechelen, 2009; Copenhagen School Child Intervention Study, 2010; Sacher et al., 2010; M. A. Carvalho, Ramos, Rito, & Breda, 2011; Alive 'N' Kicking Extended Report, n.d.); (2) improvement in food habits (including: increased

consumption of fruits and vegetables; consumption of daily breakfast, following the nutrition guidelines, decreased consumption of sugary drinks) (Food Dudes, 2006; Singh et al., 2009; Borys et al., 2011; Alive ‘N’ Kicking Extended Report , n.d; B. W. Jensen, n.d.); (3) improvements of the levels of physical activity (including: daily exercise, increase in the daily steps, reduction of sitting time, reduction of sedentary behaviours, increased physical activity) (Jurg, Kremers, Candel, Van der Wal, & De Meij, 2006; Simon et al., 2006; De Cocker et al., 2008; MacPhail, Tannehill, & D. & O’Sullivan, 2008; Singh et al., 2009; Copenhagen School Child Intervention Study, 2010; Sacher et al., 2010; Borys et al., 2011; Alive ‘N’ Kicking Extended Report, n.d.); (4) changing or including the environment (involving parents, teachers, nurses, communities and changing in school health policies, facilities and food offer with more opportunities for healthy eating and physical activity in school and communities) (Jurg et al., 2006; Simon et al., 2006; Singh et al., 2006; Bugge, Hermansen, Froberg, & Andersen, 2009; Kuipers, 2010;; Be Active ASAP , n.d; The Copenhagen School Child Intervention Study. CoSCIS, n.d).

Interventions/programmes that were developed worldwide had also shown positive effects in preventing and/or reducing overweight and/or obesity. Some studies in the United States of America, Australia and New Zealand had positive results in children and adolescents with ages between 0-14 years old, and similar results of the present review, since there were also improvements in: (1) body composition such as: decrease in BMI, reduction of the prevalence of childhood obesity, slowing the rate of weight and waist gain, and reduction of waist circumference (Economos et al., 2007; Franks et al., 2007; Taylor et al., 2007; Sanigorski, Bell, Kremer, Cuttler, & Swinburn, 2008; Gentile et al., 2009; de Silva-Sanigorski, Bell, et al., 2010); (2) food habits like the increased consumption of fruits, vegetables and water, decreased consumption of sugary drinks and high-energy snacks and decrease of fat intake (de Silva-Sanigorski, Bell, et al., 2010; DeVault et al., 2009; Franks et al., 2007; Gentile et al., 2009; Taylor et al., 2007) and (3) physical activity such as a reduction of the TV/videos viewing, increased knowledge of the activity physical and increased levels of physical activity (Franks et al., 2007; Taylor et al., 2007; DeVault et al., 2009; Gentile et al., 2009; de Silva-Sanigorski, Bell, et al., 2010).

Most of the outcomes presented in this review are multicomponent interventions and/or environmental which separately or together include the improvement of food habits and increased physical activity in order to be adopted healthy lifestyles such as the Watch it, Alive‘N’Kicking, Everything Affects Us Especially Ourselves, DoiT, Copenhagen School Child Intervention Study, JUMP-in, Be Active after-school Activity, Shape Up and Intervention Centred on Adolescents’ Physical activity and Sedentary behaviour programmes. This concur with programmes/interventions developed in USA, Australia and New Zealand, like the Switch, Shape Up Somerville, Romp & Chomp, Be Active Eat Well, It’s all about Kids, Catch and Apple programmes.

According to the results obtained in this review the two interventions that included at least a nutritional or a physical activity component revealed to be effective in changing only that correspondent component: healthy dietary behaviours or improvement of physical activity (Food Dudes, 2006; De Cocker et al., 2008; Mental Health Compass, n.d.). When comparing this interventions with the five multicomponent interventions in this review, three proved to be more effective because the comprehensive approach showed improvements at least two components, such as in body composition and/or in physical activity or food habits (Rudolf et al., 2006; Sacher et al., 2010; Alive ‘N’ Kicking Extended Report, n.d.). Thus the strategies that are multicomponent seems to be more effective in tackling obesity because they influence changes in several behaviours (dietary and/or physical) with reduction of BMI. According to Harris, Kuramoto, Schulzer, & Retallack (2009) interventions aiming to increase physical activity and improve diet are the foundation of efforts to prevent and tackle childhood obesity.

However interventions that were directed only to the environment and physical activity component, there were only changes and/or improvements in of physical activity levels (Jurg et al., 2006; Simon et al., 2006; Be Active ASAP , n.d.).

Additionally two environmental and multicomponent interventions/programmes (Singh et al., 2009; The Copenhagen School Child Intervention Study. CoSCIS, n.d.) showed the most effective and relevant results of all since there were improvements in body composition with both changes and improvements in eating habits and physical activity.

Therefore, it was proven that multicomponent and environmental interventions, compared, have more positive results in the prevention of overweight and obesity, since there are improvements at all components (dietary, physical and body composition). The Switch, Romp & Chomp, Planet Health, Catch and Apple programmes which are multicomponent and environmental interventions, derived from USA, Australia and New Zealand, also had the same positive results. They had improvements in all components (body composition, physical activity levels and eating habits) (Franks et al., 2007; Taylor et al., 2007; Gentile et al., 2009; de Silva-Sanigorski, Bell, et al., 2010).

According to Economos et al., (2007); A. Colin Bell et al., (2008); DeMattia & Lee Denney, (2008); it's possible to prevent overweight and obesity in children and adolescents through a multifaceted environmental change approach that involves the community, schools, families and parents that should work together to ensure that the environments of the children functions in the right way and to ensure if they making healthy choices.

Although in the present review most of the programmes were community or school based interventions (95,7%), still with the results obtained, most of the programmes/interventions had the involvement of parents or relatives since they play an important role and they are, in fact, role models in the lives of children and adolescents and therefore, they may influence their behaviour or the family environment, so they should be encouraged to participate (Doak, Visscher, Renders, & Seidell, 2006; Haerens et al., 2006; Sharma, 2011).

Nevertheless, the majority of programmes included in this briefing review, are aimed to children probably due to the fact of the risk of an overweight child became an obese adult (DeMattia & Lee Denney, 2008; Pratt, Stevens, & Daniels, 2008; Briançon et al., 2010) , and also because they are the population group most influenced by the

environment and they will benefit the most prevention efforts (A. Colin Bell et al., 2008).

This brief review revealed that most of the interventions and programmes that promote physical activity, healthy food habits and environmental changes are effective at all levels (community, school and family) and may subsequently prevent and counteract obesity.

Conclusions

On this briefing review the overall (60,8%) of the programmes/interventions found, proved to be effective in preventing and/or reducing overweight and/or obesity and improving food habits and physical activity levels on the target groups (children and adolescents) at local or municipality level in the WHO European Region. It's not known if all the programmes included in this review are successful or effective on its objectives since there were launched recently or are still on going and therefore the results have not yet been published.

Taking into account that most of the interventions/programmes at local level described in this review are effective and successful to prevent and/or reduce overweight and obesity, there is an increasing need to gather and compile all the interventions done so far, subsequently in all countries, especially in the WHO European Region, which are able to prevent overweight and obesity that causes so many health consequences, by benchmarking effective interventions.

Although the progress made on the prevention of overweight and obesity among population worldwide, most of the countries, especially in the WHO European Region, are still facing nutrition-related problems (Borys et al., 2011). According to the “*Comparative Analyses of Nutrition Policies in WHO European Region*” document, most of the countries continue to have high intake of fat, while vegetables and fruits intake remains low and obesity maintains a problem for public health (Trübswasser, Branca, & Tirado, 2006; Trübswasser & Branca, 2009).

On this review there were a batch of limitations. First, in many countries the information about the implementation and the results of the interventions is not available yet, as the majority of the strategies, policies and programmes were just recently developed. That said the “grey literature” based in Google search for example added due to the fact that there are a lot of material that is not published, and most of the programmes found are on going or running programmes and they are not published on scientific journals. Second, the research was difficult since the mainstream of the interventions are created and developed in the United States of America, Australia, South America and Asia and this review is related to the WHO European Region. The

third limitation was the diverse languages found on the different websites that led to the use of the “Google translator tool”.

According to the present review it's necessary having more multicomponent and environment interventions that were effective and pertinent in the prevention of obesity. Nevertheless it's necessary to congregate all information about the interventions that aimed to the prevention of obesity in all age groups to be able to reverse this trend locally, regionally and internationally.

ANNEX 1 – Interventions/programmes included in the present review

Table 1: Community-based interventions

Name of the Programme/Intervention/Project	Action in the rest of the world	Action in WHO European Region	Design and target-group	Objectives/Aims	Description	Results/Conclusions
<p>1) WATCH IT Programme</p>	<p>----</p>	<p>UK: Leeds and another areas in England</p>	<p>- Community-based weight management programme for children, teenagers and their families who want to achieve good health through balanced eating and physical activity (NHS Leeds Community Healthcare, 2011)</p> <p>TG: children from 5 to 18 years of age (NHS Leeds Community Healthcare, 2011)</p>	<p>- Aims to encourage lifestyle change by taking a motivational enhancement and solution focused approach along with opportunity for physical activity (Rudolf et al., 2006)</p>	<p>The programme offers:</p> <ul style="list-style-type: none"> - Weight management for overweight and very overweight children and young people; - Lifestyle advice and support for client families; - Assessment of individual family needs and signposting to other support; - Promotion of health and wellbeing; - General health information and advice <p>2 separate programme:</p> <p>WATCH IT Classic Programme for the whole family:</p> <ul style="list-style-type: none"> - Is a physical activity and lifestyle programme for secondary school age children and young people (11 to 18 years with a BMI on or above the 91st percentile) and their families. The programme has duration of 16 weeks and addresses eating behaviours, nutrition and physical activity <p>Healthy Families Programme – For Parents Only:</p> <ul style="list-style-type: none"> - Is a 10 week, term-time, parent-only group, designed for parents and carers of primary school children (5 to 11 years with a BMI on or above the 91st percentile) to support them to achieve and maintain a healthy weight for their children (NHS Leeds Community Healthcare, 2011) 	<ul style="list-style-type: none"> - Significant reduction in overweight at 6 months; - 54% of children at 3 months and 71% at 6 months had shown a decrease in BMI scores. - The mean change in BMI was greater in girls and for participants aged 13 and over (Rudolf et al., 2006)

<p>2) <i>Le Programme Nutrition, Prévention et Santé des enfants et des adolescents en Aquitaine</i></p>		<p>France: - Aquitaine</p>	<p>- Community-based programme; TG: children aged 3–18 years, their families, health and educational professionals (Sehti et al., 2008)</p>	<p>Main objective: is to stop the rates in childhood obesity. Objective: improve the behaviour of children and adolescents regarding healthy diet and physical activity and at stabilizing the prevalence of childhood obesity (Sehti et al., 2008)</p>	<p>Action in 3 areas: 1st: early screening, prevention and management of obesity during childhood by mobilizing school doctors and nurses throughout Aquitaine, using clinical guidance in screening and treating those already overweight and providing training for health professionals; 2nd: improve the availability of healthy food at school and at leisure time facilities; 3rd: implementation of health promotion activities in the fields of nutrition and physical activity for children and families, together with training sessions for health and education professionals (Sehti et al., 2008)</p>	<p>Prior to these actions, various surveys have been conducted that led to an inventory of the prevalence of overweight and obesity in children and adolescents and their habits in terms of eating and activity physical. The renewal of these surveys will help assess the impact (Nutrition Enfant Aquitaine, n.d.)</p>
<p>3) <i>El Ejercicio Te Cuida</i></p>	<p>----</p>	<p>Spain: - Extremadura region</p>	<p>Community-based intervention TG: elderly with ≥ 60 years old who are overweight, are hypertensive, have diabetes type 2 or are moderately depressed to primary care centers (Sehti et al., 2008; El Ejercicio Te Cuida, n.d.)</p>	<p>Aim: increase and improve health/quality of life in the elderly through the practice of physical activity (Sehti et al., 2008; Europa Press, 2009)</p>	<p>- General practitioners refer those of the target group to sports specialists based in primary care centre's who periodically assess participants and deliver a structured walking-based group programme, including talks and exercises 3 days a week. - The programme includes inexpensive screening and recruitment in primary care, adding four major psychosocial factors to the referral to usual exercise advice, to enhance the benefits of physical activity. - There's an individual evaluation and assessment: Each older user is evaluated at baseline and every 6 months. The main outcomes are socio-demographic issues, referral process, health status (morbidity, geriatric depression scale, cholesterol, triglycerides, blood pressure, etc.), mini nutritional assessment, health-related</p>	<p>- After 3 years of implementation, more than 6000 older people have been assessed in 130 municipalities and over 4000 people exercise regularly with the programme. Most of participants were women who live in rural areas reducing the inequalities of physical active aging. - Older people's fitness (flexibility, 6-minute walking distance, agility and balance reducing the fall risk, etc.) significantly improved and there was a 30% reduction in depression (Mental Health Compass, n.d.)</p>

					quality of life, use of health system and fitness (Mental Health Compass, n.d.)	
4) Alive 'N' Kicking		UK	<p>- 12-week childhood obesity intervention programme (Alive 'N' Kicking Extended Report, n.d.).</p> <p>TG: children's and adolescents aged 2 – 19 (Weight Management Centre, 2011)</p>	<p>- Aim: promote a healthier lifestyle for families with overweight children in the UK (Alive 'N' Kicking Extended Report, n.d.)</p>	<p>- 12 week programmed workshops and activity sessions that educate families on the importance of healthy eating and increasing physical activity levels (Weight Management Centre, 2011)</p> <p>- These weekly workshops involve groups of parents and their children of similar ages and they discuss weight management, nutrition and healthy eating. Those that sign up can try out a number of different activities and cooking workshops. Older teenagers will also benefit from one-to-one programmes. Topics covered include Shop Smart; five eating points a day, snacking, food preparation and portion distortion (London Borough of Sutton, 2009)</p>	<p>- 92.5% of children decreased their BMIz score from baseline to week 12</p> <p>- 80% of children decreased their waist circumference over 12 weeks. The average reduction was – 5cm;</p> <p>- 82% of fitness test completers at week 1 and week 12 have improved their fitness levels;</p> <p>- 88% of completers were now consuming breakfast every day compared to only 56% before the start of the programme;</p> <p>- 70% of children improved their daily consumption of fruit & vegetables following the completion of a 12 week programme (Alive 'N' Kicking Extended Report, n.d.)</p>
5) THAO Salud Infantil	----	Spain: - 95 municipalities through Spanish territory	<p>Childhood obesity prevention programme that takes place at the municipal level throughout the Spanish territory (THAO, n.d.)</p> <p>TG: children</p>	<p>Aim: Change the behaviour of population regarding physical activity and diet to promote healthier lifestyles and prevent childhood obesity (THAO in Spain, n.d.)</p> <p>3 main objectives:</p> <ol style="list-style-type: none"> 1. Promote healthy food habits through education and familiarize 	<p>- It takes place in seven seasons at different times which is highlighted a food group or an activity, keeping always the physical activity. The seven seasons are:</p> <ol style="list-style-type: none"> 1. Fruit season; 2. Water and beverages season; 3. Cereals and grains season; 4. Fruits and vegetables season; 5. Dairy products season; 6. Physical Activity season; 	<p>- The last study, whereby more than 17.000 children from 3 to 12 years old were measured, concluded that 28 % of children have weight excess, and among them 8 % of children are obese (THAO, n.d.)</p>

			between 0 and 12 years old and their families (THAO, n.d.)	children through fun activities such as diversity, taste and choice of food. 2. Stimulate the children to the practice and habit of physical activity, not only sport but also active games, leisure and social participation. 3. Conduct a regular evaluation of the results of all actions developed within the scope of the programme, including measurement (weight, height, waist circumference) of all children involved (THAO, n.d.)	7. Fish and shellfish season (THAO, n.d.-b) - BMI and waist circumference are measure once a year to calculate the prevalence of overweight and obesity and to assess the effectiveness of the programme. - Another annual study is about food and physical activity habits of the children (THAO, n.d.)	
6) VIASANO Programme	----	Belgium: - 2 pilot cities: Flanders (Hasselt) and Wallonia (Mouscron). - 15 cities: Jette and Woluwe-Saint-Pierre (Brussels); Marche-en-Famenne; Comines-Warнетon; Mouscron; Flobecq; Mons; Rochefort; Liège and Pepinster (Wallonia);Aarschot; Huldenberg; Hasselt; Dilsen-Stokkem; Schilde (Flanders) (VIASANO, n.d.).	- The VIASANO programme is based on a method that encourages the involvement of all local actors (Viasano, 2009) – TG: Children and families	- Help families to change healthy lifestyles, through the following recommendations: 1. Eat a balanced, diversified, affordable and fun diet at the family level. 2. Practice of physical activity for all integrated in everyday life. 3. Encouragement (Viasano, 2009) - Childhood obesity prevention and reduction of cardiovascular risk in adults (VIASANO, n.d.)	- Acts on local and national level (Viasano, 2009) - The programme is adapted in order to integrate relevant recommendations, policies and vision on healthy diet and physical activity (VIASANO, n.d.). - Campaigns for the general public that integrates the latest scientific knowledge in obesity prevention, such as: “Fruit are good for us!”, “Are you active or sedentary?”, “Dairy products, a pleasant change!”, “Be active as a family”, “Vegetables, let’s go for more!”, “Move at school, at work”, “How to manage sweets and crisps?”, “Be active, whatever the weather!”, “Meals”, “Fewer screens, more movement”, “Light-handed fat consumption!”, “Sleep / slumber” (Borys et al., 2011). - Each VIASANO city is engaged in the programme for 4 years. Every 6 months, a campaign proposes one theme to the	- As part of programme evaluation, urban children VIASANO are weighed and measured every two years, according to patterns specific to each regional location. This measure has the objective to determine the prevalence of childhood obesity using data collected by the medical school to assess the impact of information campaigns and awareness (Viasano, 2009)

					population related to a healthy diet, or the promotion of physical activity or a well-being-related topic (e.g. a good sleep) (VIASANO in Belgium, n.d.).	
7) ΠΑΙΔΕΙΑΤ ΡΟΦΙ	----	Greece - 14 municipalities: Agia Paraskevi; Galatsi; Delphi; Argyroupolis; Thebes; Kalymnos; Kifissia; Corinth; Maroussi; Paleo Faliro; Pavlos Melas; Perama; Saronic Athens; Chalcidon (Συχνές Ερωτήσεις, n.d.).	- Community-based intervention. - TG: children from 6 months to 12 years and their families (Συχνές Ερωτήσεις, n.d.).	- Promote the adoption of healthier lifestyles by families and children, contributing to preventing childhood obesity in Greek communities (Borys et al., 2011) - Education of the population in the pilot cities and promotion of healthy and balanced diet to reduce the prevalence of childhood obesity in Greece - Help children and the whole family to change their lifestyle habits (Το Πρόγραμμα, n.d.).	- Its addressed to the local community and the actions are implemented to municipal authorities - The programme has specific themes and last 6 months. Each module is designed to promote specific messages, such as promotion of physical activity; increase the consumption of fruit; promotion of the breakfast - In practice there were developed <i>materials</i> , with the objective to inform the citizens, such as: leaflets and posters, teaching methods, letters to health professionals, newsletters. There were also developed <i>actions</i> and they act in 2 levels: 1 st the National Coordinator participates in conferences to inform the target audience the programme; 2 nd original and interactive events promotes the messages of the programme and informs citizens about the prevention of childhood obesity (Συχνές Ερωτήσεις, n.d.).	- It's the first health promotion programme in Greece implemented at local level - Prevalence of overweight has been measure once in the Paideiatrofi towns (n=2821) and the measures will be repeated in 2012 (Borys et al., 2011)
8) JOGG (Jongeren Op Gezond Gewicht)	----	Netherlands: 6 municipalities and the province of Drenthe (Borys et al., 2011)	- TG: children and youth (0-19 years old) and their environment (parents, schools, physical environment) (JOGG: Jongeren op Gezond Gewicht, n.d.)	- Aim: Reverse the increasing trend in overweight in children and adolescents through lifestyles changes and promotion of physical activity (Borys et al., 2011; JOGG: Jongeren op Gezond Gewicht, n.d.)	5 pillars of Jogg: 1. Political and administrative support – healthy weight as part of healthy lifestyle; 2. Public-private partnerships – local companies are involved in the jogging approach; 3. Social marketing 4. Scientific research; 5. Connection between prevention and care Examples of a <i>Jogg</i> municipality in	No results found. The programme was launched in 2010 (Borys et al., 2011)

					<p>practice:</p> <ul style="list-style-type: none"> - Cooking class in school; - Police improved social security so children can play outside; - Play facilities in district; - In the supermarkets the healthy foods are at eye level; - Limited snacks available in schools and sports canteens; - Doctors and social workers collaborate with other health professionals to promote healthy lifestyles (JOGG: Jongeren op Gezond Gewicht, n.d.). 	
9) Everything affects us, especially ourselves	---	<p>Iceland: - 25 municipalities (Public Health Institute of Iceland, 2006).</p>	<p>Community-based programme</p> <p>TG: children, youths and their families who live in the participating municipalities (Borys et al., 2011)</p>	<p>- Promote healthy lifestyles of children and their families by emphasising increased physical activity and improved diet (Public Health Institute of Iceland, 2006).</p>	<p><i>The process involves:</i></p> <ul style="list-style-type: none"> - Each municipality creates it's own policy and action plan regarding children's lifestyle emphasising physical activity and nutrition. - Framework involving parents in healthy family lifestyle - Framework in Health Education for school-children regarding healthy lifestyles - National electronic database and regular questionnaires for process and evaluation <p><i>Impact and outcomes of the process:</i></p> <ul style="list-style-type: none"> - More health-orientated environment in municipalities, schools, and kindergartens regarding physical activity and nutrition; - Parents' attitudes and experiences regarding healthy lifestyle - Children's knowledge, skills and habits regarding healthy lifestyle (Borys et al., 2011; Everything Affects us Especially Ourselves, n.d.). 	<ul style="list-style-type: none"> - 91% of elementary schools follow PHI guidelines on nutrition for school- children, compared to 65% in 2005 - 90% of school nurses have received and use the educational material - More kindergartens offer fresh fruit every morning and vegetables daily with lunch - Proportion of kindergartens offering fish at least twice a week are 95% - 82% of kindergartens follow the PHI guidelines (Borys et al., 2011)

<p>10) 10,000 Steps Ghent (De Cocker et al., 2008)</p>		<p>Belgium: - Ghent (intervention community) - Aalst (comparison community)</p>	<p>- Community-based intervention to promote physical activity in adults.</p>	<p>- Promotion of physical activity in adults.</p>	<p>- 648 participants from Ghent were selected and 592 from Aalst completed the telephone administered long-version of the International Physical Activity Questionnaire (IPAQ) and a 7-day pedometer log. - During the intervention the physical activity was promoted in Ghent using the central theme of 10,000 steps/day with a secondary tagline of “every steps counts” - Other physical activity guidelines were also promoted such as 30min/day of moderate physical activity on 5 days/week</p>	<p>-The pedometer-based intervention “10,000 steps Ghent” resulted in a decrease in sitting time; - In average, weekday and weekend day sitting time decreased in the intervention community, sitting time increased in the comparison community; - The total sitting time on the intervention participants decreased significantly. - The results suggest that “10,000 steps Ghent” was successful in decreasing sitting time, as well as in increasing step counts.</p>
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Table 2: School-based interventions

Name of the Programme/Intervention/Project	Action in the rest of the world	Action in Europe	Design and target-group	Objectives/Aims	Description	Results/Conclusions
<p>11) DOiT (Dutch Obesity Intervention in Teenagers)</p>	<p>---</p>	<p>- Netherlands: Friesland; Groningen; Drenthe; Overijssel; Gelderland; Flevoland; Noor-Holland; Zuid-Holland; Zeeland (DOiT , 2011)</p>	<p>- School-based intervention programme with a duration of one school-year (eight months from October – May) (Singh et al., 2009).</p> <p>TG: 1108 Adolescents of 18 prevocational secondary schools (age 12-14 years) (Singh et al., 2009).</p>	<p>- Prevention of excessive weight gain through the change of the following health behaviours: (1) reduction of the consumption sugar-sweetened beverages; (2) reduction of energy intake derived from snacks; (3) decrease of levels of sedentary behaviour; (4) increase levels of physical activity (Sehti et al., 2008; Singh et al., 2006).</p>	<p>- Measure of the body composition (weight, height, waist an hip circumference and 4 skinfold thickness); measure on changes in dietary and physical activity behaviour before and after the intervention (Sehti et al., 2008; Singh et al., 2009).</p> <p>- The data was collected at baseline (at the start od the first school year of secondary school), and after 8 months (immediately after intervention), 12 months (4 months after intervention) and 20 months (12 months after intervention) (Singh et al., 2009).</p> <p>There are 2 components: - Individual component: 11 lessons in biology and physical education. The first six lessons aimed at raising awareness and information processing with regard to energy balance-related behaviours. The second five lessons aimed at facilitation of the choice to improve one of the identified risk behaviours. - Environmental component: additional lessons in physical activity and advice on the choice of foods in the school canteen. This component consisted of a school-specific advice on the choice of the school canteen with the following change options: offer smaller portion sizes; offer more “healthy” products or</p>	<p>- Beneficial effects on the sum of skinfold thickness measurements in girls and consumption of sugar-containing beverages in boys and girls in the short and long terms.</p> <p>- The sum of skinfold thickness measurements was lower in girls at both 8-month and 20 month follow-ups; for boys the waist circumference was lower at 8-month and 20 month follow-ups.</p> <p>- The intervention resulted in significantly lower self-reported consumption of sugar-containing beverage’s both at 8-month and 12 months (boys and girls);</p> <p>- The screen-viewing behaviour was statistically significant difference in boys after 20 months (Singh et al., 2009).</p>

					restricting access to vending machines. Foodstuffs were labelled as red (Better do not), yellow (only sometimes) or green (DoiT) (Singh et al., 2009, 2006).	
12) Food Dudes (FD)	<p>USA: - <u>California:</u> 1 School;</p> <p>- <u>Utah:</u> 7 schools.</p>	<p>UK: - <u>Bedfordshire</u> 4 schools;</p> <p>- <u>Coventry</u> 30 schools;</p> <p>- <u>Dudley (Starting September 2011)</u> 14 schools;</p> <p>- <u>Walsall (Starting September 2011)</u> 12 schools;</p> <p>- <u>Wolverhampton</u> 84 schools;</p> <p>- <u>Yorkshire:</u> 2 schools;</p> <p>Ireland 1590 schools; Sicily 3 Schools (Food Dudes, 2009a).</p>	<p>- School-based intervention designed for primary schools.</p> <p>- TG: children from 4-11 years old (Food Dudes - Bangor, 2009)</p>	<p>- Changes children's eating habits for life through: - Encourages children to eat fruit and vegetables both at school and at home</p> <p>- Helps children develop a liking for fruit and vegetables</p> <p>- Encourages children to reduce their snack food consumption</p> <p>- Encourages children to become proud to think of themselves as healthy eaters</p> <p>- Changes the 'culture' of a school to one that strongly supports healthy eating (Food Dudes - Bangor, 2009)</p>	<p>2 Phases: <i>Phase 1 (16 days):</i></p> <p>- Each day, children read and/or see a DVD episode starring with the Food Dudes which provides a influential role-models for children to imitate;</p> <p>- A portion of fruit or a portion of vegetables is given to children and those who succeeded in eating both are given a reward like a pedometer;</p> <p>- It's also provided a Food Dudes pack to encourage children to eat more fruit and vegetables at home through the involvement of parents and a system of self-monitoring.</p> <p><i>Phase 2:</i> In this phase the programme continues to support successful eating of fruit and vegetables, but with less intensity than during Phase 1. Classroom Wall Charts are used to record consumption levels of these foods, and as the children achieve more advanced goals they earn further rewards and Food Dudes certificates (Food Dudes - Bangor, 2009)</p>	<p>Overall results:</p> <ul style="list-style-type: none"> - Large increases in consumption of fruits and vegetables; - Increases in consumption are long-lasting; - Increases extends across a wide range of fruit and vegetable varieties; - The effects generalize across contexts like school to home; - Is equally effective for boys and girls (Food Dudes, 2009) <p>London results:</p> <p>The experimental school ate 20% of the fruit and 35% of the vegetables served during lunchtime. During the intervention the fruit consumption trebled to 69% and the vegetable consumption increased from 35% to 55%. After 4 months, when the follow-ups were done, the children continued eating almost 3 times as much fruit as at baseline and the changes in vegetable consumption was maintained at 53% (Food Dudes, 2006).</p>

<p>13) Copenhagen School Child Intervention Study (CoSCIS)</p>	<p>-----</p>	<p><u>Copenhagen</u> Ballerup Tårnby</p>	<p>- School-based intervention (B. W. Jensen, n.d.)</p> <p>- 4 year controlled intervention study with 7-years follow-up (Bugge et al., 2009)</p> <p>- Intervention group (Ballerup municipality) Control group (Tårnby municipality) (The Copenhagen School Child Intervention Study. CoSCIS, n.d)</p> <p>- 18 schools in two different local communities of Copenhagen (n=695 at baseline (mean age 6.74 years), 606 at 4-years follow-up (mean age 9.45 years) and 513 (mean age 13.35 years) at 7-years follow-up) (Bugge et al., 2009)</p>	<p>Aim: Measure the effect of the intervention on the children's physical and psychological health and well-being on different parameters, such as:</p> <ul style="list-style-type: none"> - Physiological/health-related parameters; - Personally and socially capabilities; - Motor performance skills; - Dietary intake. (The Copenhagen School Child Intervention Study. CoSCIS, n.d) 	<p>Plan of action:</p> <ul style="list-style-type: none"> - Extra physical exercise (PE) lessons - a doubling of the amount from 2 to 4 hours/week - Gyms and athletic facilities were modernized; - Continuing education of PE teachers in healthy living and diet and how to provide motivating PE lessons that enhances the enjoyment of being physically active; - Collaboration between teachers, students and parents on the child's development both on motor skills and physically (capability level) - A place to be physically active on an after school basis - Renovation of all outdoor facilities - Health-related issues were incorporated in the general education through the intervention years - Healthy food in school canteens (The Copenhagen School Child Intervention Study. CoSCIS, n.d) 	<ul style="list-style-type: none"> - A follow-up study found significantly higher intake of both fruit and vegetables among the children in Ballerup compared to Tårnby (B. W. Jensen, n. d.) - Body composition and physical fitness in the girls in the age of 6 have a higher skinfold value than boys (but not higher BMI), lower activity and lower fitness. In contrast, girls had significantly better insulin sensitivity than boys. - The difference between intervention and control municipality in the development of the measured parameters were small or non-existent after 3 years of intervention. There was found a significantly better development in the intervention group in the values of fasting glucose, waist-hip circumference ratio and diastolic blood pressure. - The boys in the intervention group had significantly better changes in insulin levels than boys in the control group. - In the group of obese children, there was any difference between the intervention and control group (Copenhagen School Child Intervention Study, 2010)
	<p>----</p>	<p>Amsterdam - De Baarjes</p>	<p>- Primary-school-based intervention</p>	<p>- Focus: use of theory, environmental changes, parental</p>	<p>- A team goes to the schools to report and register data of all pupils of sport,</p>	<p>- The programme was effective in influencing physical activity, especially</p>

<p>14) JUMP-in, Kids in motion</p>		<ul style="list-style-type: none"> - Bos en Lommer - Geuzenveld-Slotermeer - Osdorp - Slotervaart - Stadsdeel Noord - Oost-Watergraafsmeer - Zeeburg - Stadsdeel Zuidoost (JUMP-in , n.d.) 	<p>TG: children from 4-12 years old and parents (Kuipers, 2010).</p>	<p>influences and cooperation with multi-level parties in intervention development (Jurg et al., 2006).</p> <p>- Aim: promote physical activity among primary school children in deprived areas in Amsterdam, and to make them more aware of the influence of nutrition on their body (Kuipers, 2010).</p>	<p>fitness, and weight in proportion to length. The data are in a database and used for follow up of every child separately, to see which specific component needs extra stimulation. When the data is indicating that the child needs professional support and help, the school will contact the school nurse (Kuipers, 2010).</p> <p>- 6 programme components:</p> <p>(1) <u>School sport activities</u> during the schools hours, children have contact with a variety of sports and each sport a number of times in several weeks. (2) <u>A pupil follow-up system</u> – the physical education teacher monitors the pupils once a year, in order to stimulate them in a structured way in their development in areas of sport and physical activity.</p> <p>(3) <u>The Class Moves!, in-class exercises</u> – offers breaks for physical activity, relaxation and posture exercises during normal lessons.</p> <p>(4) <u>Choose your Card!</u>, cards aimed at raising awareness of the importance of physical activity for health.</p> <p>(5) <u>Parental information services</u> about the importance of physical activity and exercise for the children and the role-played by the parents in supporting and stimulating such activity among their children.</p> <p>(6) <u>Activity-week</u> with a sport and activity exhibition, sports activities during the week, a warming-up session for the parents and a sport market where the parents and children meet</p>	<p>among children from Grade 6. Children in the control group decreased their level of physical activity considerably, while activity levels in intervention children from Grade 6 remained stable (Jurg et al., 2006).</p>
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<p>15) Be active after-school activity programme (Be Active ASAP)</p>	<p>----</p>	<p>Ireland (75 schools across Dublin)</p>	<p>School setting</p> <p>TG: children with 7-8 years old and their parents (Be Active ASAP , n.d.)</p> <p>There are currently 75 schools across Dublin North East region participating in the Be Active After-School Activity Programme (Be Active ASAP, n.d.)18/11/2011 15:33:00</p>	<p>Aim: improve physical activity patterns of school children by introducing them to a wide variety of activities in a fun, supportive, positive environment where everyone is involved (Be Active After-School Activity Programme Launch, 2011)</p>	<p>local sport clubs (Jurg et al., 2006).</p> <ul style="list-style-type: none"> - Links with the Physical Education Curriculum for 1st/2nd class, building on what has been learned in class and offering breadth and diversity of activities; - Takes place for approximately 50 minutes immediately after school on selected days every week throughout the year; - Uses school facilities and is led by teacher leaders and supported by volunteer parent leaders; - Free of charge to schools and includes: <ul style="list-style-type: none"> - Training for teachers, programme resources, on-going advice and support visits (Be Active ASAP, n.d.) 	<ul style="list-style-type: none"> - 312 students from 4 different schools took part of the evaluation of this programme. 52% were boys and 48% were girls aged between 6 and 9 years. 41% (n=129) took part in the intervention and were classified as the experimental group, 59% (n=183) were in the control group. - Self-report questionnaire was used to collect behavioural and psychosocial data from each child (Active Commuting to School; Leisure-Time Physical Activity During School Hours and after school; Pedometer Data (7 days with the pedometer); School-Day Affect; Preferred School Subject; Enjoyment of Sport and Physical Activity <p>Results:</p> <ul style="list-style-type: none"> - The level of active commuting to school were high, with girls equally likely as boys to walk or cycle to school - Almost 70% of the participants were meeting the current recommendations of steps per day as measured by a 3 week day and one weekend day pedometer count (applied equally to boys and girls) - 45% of the experimental group and 35% of the control group reported that if given the choice, they would like to be either outside playing with friends or playing sport in a club instead of doing homework.
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						- Both groups showed similar improvements in their evaluation of how the thought of another ‘day in school’ made them feel. Levels of enjoyment of physical activity were high for all children involved (MacPhail et al., 2008).
16) SETS – I’m living healthy too!		Romania: - All schools in Bucharest (Borys et al., 2011).	- School-based intervention - TG: children aged up to 12 years old.	- Prevent juvenile obesity among children under 12 years of age and promoting a healthy lifestyle among families (PR, Relatii Publice PRAIS, 2008)	- All pupils will receive an educational booklet free-of-charge, which promotes the benefits of daily physical exercises and balanced nutrition, Olympic sports – values and role models. - The teachers and parents will be informed directly, while open lessons provided by opinion leaders will be organised in schools (PR, Relatii Publice PRAIS, 2008)	- The assessment of the movement’s impact will be made based on questionnaires filled in by pupils, parents, teachers, while the results will be made public (PR, Relatii Publice PRAIS, 2008)

Table 3: Community- and school-based interventions

Name of the Programme/Intervention/Project	Action in the rest of the world	Action in Europe	Design and target-group	Objectives/Aims	Description	Results/Conclusions
17) Shape Up	----	26 cities in 25 Member States in Europe (Shape Up Europe, 2006a)	<ul style="list-style-type: none"> - School-community approach; - TG: children and youth and their families (A school-community approach to influence the determinants of a healthy and balanced growing up, 2006). 	<ul style="list-style-type: none"> - Aim: address the determinants of childhood obesity, as well as promote health and wellbeing in the communities of the participatory cities (A school-community approach to influence the determinants of a healthy and balanced growing up, 2006) - Bring together the principles of health education, prevention and promotion in an integrated programme; - Promote health and well-being; - Tackle social and environmental health determinants; - Involve schools and local communities in constructive dialogue and action planning concerning health education and promotion; - Enhance children’s and young people’s competences to carry out health promoting actions and bring about positive changes; - Undertake health-promoting actions at local level, initiated through schools by children and youth, in collaboration with stakeholders; - Empower a European network of schools and local actors in all the member states (Kuipers, 2010) 	<ul style="list-style-type: none"> - Child participation: is about letting them decide for themselves the types of games, sports and other activities that most appeal to them. - School-community collaboration: provides an opportunity for them all to think and talk about their lifestyles and living conditions and what they can do together to improve them. - Research: linked to the project will help to determine what works within specific contexts, and what is learnt from this experience will inform future health promotion activities. - No stigma: positive and critical view of food and body movement. - Capacity building: it’s recruited 2 and they will be responsible for training local community partners and monitoring the project at a city level over its three-year duration. - City involvement: practical assistance to children in order to bring about changes in the daily 	<p>The programme has proven to be effective at the school, community and individual level and partnerships in initiating and bringing about health-promoting changes related to healthy eating and physical activity.</p> <p>School level: school health policies; school environment, facilities and food offer (more opportunities for healthy eating and physical activity) and educational strategies and contents in health education and physical education class;</p> <p>Community level: physical environment, facilities and food offer in the community surrounding the schools (more opportunities for healthy eating and physical activity)</p> <p>Partnerships: sustainable partnerships between local stakeholders in the area of prevention and health promotion; focused cooperation with parents and extended families to encourage and sustain healthier choices</p> <p>Individual level: children’s and</p>

					life of the city. More resources: provide guidelines, materials and finance for specific health-promoting actions both in and out of school (Shape Up Europe, 2006b)	young people's sense of ownership, motivation and empowerment and parental awareness and motivation related with the issues of healthy eating and physical activity (Kuipers, 2010).
18) MUN-SI (Silva, Ramos, & Rito, 2011)	----	Portugal: 5 municipalities: - Oeiras; - Fundão; - Montijo; - Seixal; - Viana do Castelo	- Community-based intervention in 5 municipalities TG: 3173 children (6-9 years old), attending public elementary schools (n=167)	- Aim: Develop a local Integrated System of Childhood Nutritional surveillance at family and school level.	3 stages: 1st: Assessment of the nutritional status of children for body mass index (BMI), relating with socioeconomic, demographics and environmental factors with health, collected by a family questionnaire. 2nd: It was implemented a specific intervention in health promotion for children at school through a set activities based on healthy lifestyle and healthy food habits and also physical activity promotion at school and family environment. 3rd: Impact of the programme has been assessed during the scholar year through monitoring and evaluating the dimensions firstly selected.	- 3173 children were assessed. The prevalence of childhood overweight was 32.1% (BMI≥P85), of which 14.3% were obese (BMI≥P95); - Small family size was associated with higher children's BMI; - Lower level of education, a lower socioprofessional status and an household income of less than €1500 were risk factors for the development of childhood obesity; - Children' short sleep duration (≤8 hours/day) showed also an association with childhood obesity; - Children with high birth weight and that were not breastfed showed an association with overweight; - Children who had a daily consumption of sweets showed higher risk in developing obesity. - Most children (96.9%) took breakfast every day; a large part of the children ate lunch at school (84.1%) and 15.8% ate lunch at home.
						- Of the 293 children participants

<p>19) POZ (Project Obesity Zero)</p> <p>(M. A. Carvalho, Ramos, Rito, & Breda, 2011)</p>	<p>----</p>	<p>Portugal: 5 municipalities:</p> <ul style="list-style-type: none"> - Beja; - Cascais; - Mealhada; - Melgaço; - Silves 	<p>- Community-based intervention in 5 municipalities.</p> <p>TG: 293 children with 6-10 years old.</p>	<p>- Aim: tackle childhood obesity at municipality level through a set of activities (Healthy cooking and a nutritional guidance programme) targeted at low-income families with overweight children.</p>	<p>4 stages in the programme:</p> <ul style="list-style-type: none"> - 4 sessions of individual nutrition counselling; - Healthy cooking workshop; - 2 children's group sessions (nutrition and physical activity); - Parents/families group counselling. 	<p>in the intervention (47,5% boys and 52,9% girls; mean age 8,6 years; mean percentile 93,6), 220 (75%) have completed the programme. Mean percentile decreased by 2,369 ($P < 0,05$).</p> <p>- Data suggest that interventions at local level can have significant effects on childhood overweight prevalence.</p>
<p>20) IDEFICS (Identification and prevention of dietary – and lifestyle - induced health effects in children and infants)</p> <p>(S De Henauw et al., 2011)</p>	<p>----</p>	<p>8 European Countries:</p> <ul style="list-style-type: none"> - Sweden; - Estonia; - Germany; - Belgium; - Hungary; - Italy; - Spain; - Cyprus 	<p>Community-oriented intervention programme (COIP) for obesity prevention and healthy lifestyle in children 2-10 years.</p>	<p>Objectives:</p> <ul style="list-style-type: none"> - Develop culturally acceptable and integrated, sustainable, multicomponent COIP, targeting lifestyle and behaviour determinants at the community, school, household and individual level for the primary prevention of overweight and obesity in children in different European countries; - Implement COIP in a standardised way across 8 areas in Europe; - Evaluate different aspects of the intervention programme (children and their parents; school boards and personnel, school medical staff, mass media, local authorities etc.) <p>The 3 main focuses are:</p> <p><u>1. Diet:</u></p> <ul style="list-style-type: none"> - Improve daily consumption of fruit, vegetables and water. 	<p>First phase: 10 intervention modules compose the programme: 3 at community level; 6 at local level; 1 for parents.</p> <p><u>3 Community level:</u></p> <ul style="list-style-type: none"> - Involvement of community partners; - Long-term multimedia and public relations campaign. - Short- and a long-term perspective for the prevention of childhood obesity developed by community members. <p><u>6 School level:</u></p> <ul style="list-style-type: none"> - Building partnerships; - Integration of the key behaviours in the classroom activities and providing related homework activities; - Environmental changes related to physical activity; - Health-related physical education curricula; - Environmental and policy 	<p>- Children were examined on biological behavioural and sociodemographic characteristics at baseline (2007-2008), and again after 2 years (2009-2010). Another follow-up is scheduled to 2010-2011</p>

				<p><u>2. Physical Activity:</u></p> <ul style="list-style-type: none"> - Reduce TV viewing; - Improve daily physical activity. <p><u>3. Stress, coping and relaxation:</u></p> <ul style="list-style-type: none"> - Promotion of social life; - Ensuring adequate sleep duration. 	<p>changes related to water consumption;</p> <ul style="list-style-type: none"> - Environmental and policy changes related to fruit and vegetable consumption. <p><u>1 Family level:</u> - Educational materials for parents, providing strategies to create health promoting family environments.</p> <p>- Second phase: Implementation – societal stakeholders were encouraged to gradually take over the responsibility for the modules.</p> <p>- Third phase: Dissemination - gradually transforms social dynamics and alters the environment in a non-obesogenic direction.</p>	
21) PERSEO Programme (Programa piloto escolar de referencia para la salud y el ejercicio, contra la obesidad)	----	<p>Spain:</p> <p>8 Communities:</p> <ul style="list-style-type: none"> - Andalucía - Canarias; - Castilla and León; - Ceuta - Extremadura; - Galicia; - Melilla; - Murcia (PERSEO, n.d.). 	<ul style="list-style-type: none"> - 34 intervention schools and 33 control schools in the communities <p>TG: children 6-10 years old (PERSEO , n.d.).</p>	<p><u>Main aim:</u> promote healthy lifestyles in pupils and also involve the families. Is applied on the canteen and on the school environment in order to facilitate the healthiest choices (PERSEO, n.d).</p> <p><u>Objectives:</u></p> <ul style="list-style-type: none"> - Promote the learning of healthy eating habits and encourage regular physical activity among school children, in order to prevent obesity and other diseases; - Detect early obesity and prevent it from progressing, through clinical evaluations performed by primary care health professionals. 	<p>The activities planned on the programme are the following:</p> <ul style="list-style-type: none"> - Anthropometric assessments at the beginning and the end of the programme; - Training for schoolchildren, families, school management teams and teachers. - Interventions in school dining halls. - Interventions in extracurricular activities; - The programme also contains teaching and training material (PERSEO, n.d.). 	<ul style="list-style-type: none"> - The prevalence of obesity was 19,8% in boys and 15% in girls - The majority of participants in the programme go to school by car (35%); - 52% does physical activity (soccer and swimming), 13% doesn't do any physical activity; 9,8% does only 1h; - 33% watch 3h/day of TV - The mean percentage of daily energy from fat in boys and girls is 37% (Ministerio de Sanidad y política social & Agencia Española de Seguridad Alimentaria y Nutrición, n.d.). - The results of the programme

				<ul style="list-style-type: none"> - Improve awareness, in society in general and above all in the school environment, of the importance that educators have in this field; - Create a school and family environment that encourages a balanced diet and frequent physical activity; - Design simple indicators that are easy to evaluate (PERSEO, n.d.). 		<p>provided information's about the actual state of the canteens and children's diet (PERSEO, n.d.-b).</p>
<p>22) ICAPS (Intervention Centred on Adolescents' Physical activity and Sedentary behaviour)</p>	----	<p>Eastern France - Bas-Rhin</p>	<ul style="list-style-type: none"> - Cluster randomised controlled trial - TG: 12 year adolescents (first level in public middle schools) - <u>Communities</u>: Schools in four-school catchment defined communities in Bas-Rhin of Eastern France (Baker, Francis, Soares, Weightman, & Foster, 2011) 	<ul style="list-style-type: none"> - Prevent excessive weight gain and cardiovascular risk in adolescents by promoting physical activity (PA) with an emphasis on recreational and daily-life PA, with a lifelong perspective (Simon et al., 2006) 	<p>It's a multilevel programme with 3 principal targets: 1) to change knowledge, attitudes and motivation towards PA, by means of information and debates but also through the PA sessions offered, 2) to encourage social support by parents, peers, teachers and PA instructors, 3) to provide environmental, structural and institutional conditions for PA that encourage the adolescents to use the knowledge and skills they have learned.</p> <ul style="list-style-type: none"> -Initial surveys and biomedical data were collected; - Intermediate questionnaires on physical activity, diet, other lifestyles characteristics and psychosocial variables at the end of the first- and third-levels (Simon et al., 2006). 	<ul style="list-style-type: none"> - 479 students in control group and 475 in intervention group - Prevalence of overweight didn't differ by gender but the % body fat was slightly lower in intervention girls compared to control girls; - High plasma glucose concentration in control boys and high plasma leptin levels in control girls; - Great prevalence of overweight in pupils who didn't attend to sport clubs and in those who spend more than 3h/day in sedentary pursuits; - 50% of the students participated in at least one weekly activity (more girls than boys) - After 6 months of intervention, the proportion of adolescents that didn't practice supervised PA out of school PE (either in sports clubs or through ICAPS activities) was reduced by nearly half, from 36% to 17% more among girls than among boys. Daily time spent watching television and playing

						video games was reduced. The proportion of adolescents devoting more than 3 h/day to these sedentary behaviours decreased from 34% to 28% (Simon et al., 2006)
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Table 4: Family-based community intervention

Name of the Programme/Intervention/Project	Action in the rest of the world	Action in Europe	Design and target-group	Objectives/Aims	Description	Results/Conclusions
<p>23) MEND Programme (<i>Mind, Exercise, Nutrition, Do it (MEND programme)</i>)</p>	<p>- UK and Europe; - Australia and New Zealand; - Middle East (MEND Programme, n.d.)</p>	<p>- It's running in more than 200 locations across England and Wales and it was adopted for Denmark in partnership with Oxford Health Alliance (MEND Programme, n.d.)</p>	<p>Multicomponent community-based childhood intervention (Sacher et al., 2010) TG: children to 2-13 years old, parents (at least one (MEND Programme, n.d.)</p>	<p>- Aim: empower children and adults to become fitter, healthier and happier and to reach or maintain a healthier weight (MEND Programme, n.d.)</p>	<p>- Engages families in the weight management through 3 components: 1) education, 2) skills training, and 3) motivational enhancement. - Consists in 18 sessions delivered over 9 weeks (2h group sessions twice a week); The sessions comprised an introduction meeting, 8 sessions focusing on behaviour change, 8 sessions providing nutrition education, 16 physical activity sessions and a closing session; - All participants were assessed at baseline and then randomly allocated to start the programme immediately (intervention group) or receive the intervention 6 months later (control group) - Waist circumference, body weight, height, BMI, body composition, physical activity level, sedentary activities, cardiovascular fitness and self-esteem are assessed at baseline, at 6 and 12 months (Sacher et al., 2010)</p>	<p>- After 6 months waist circumference and BMI were highly significantly less in the intervention than the control group. The same happened for fat mass but not for % body fat; - In the control group waist circumference and BMI didn't change significantly during the 6 months; - Beneficial changes for recovery heart rate, physical activity levels, sedentary activity and global self-esteem; - Significant reductions in waist circumference and to a lesser extent BMI at 6 and 12 months; - Improvements in blood pressure, recovery heart rate, physical activity levels and global self-esteem at 6 and 12 months. - The programme was effective in reducing adiposity in children and results maintained 9 months after the intensive part of the intervention (Sacher et al., 2010)</p>

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