

Addressing the Link between Mass Media and the Increase in Obesity among European Children

An European Academy of Paediatrics (EAP) and the European Childhood Obesity Group (ECOG) Consensus Statement

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Introduction

Today children are born into a world of mass media, some of which is purely passive, some of which involves interactions (such as gaming or social media). The role of mass media in childhood development has long been studied by paediatricians and other child health experts. The effect of mass media on child health is broad, affecting a child not only physiologically, but also his/her socio-cultural functioning and psychological well-being. An increasing number of studies are linking the rise in obesity in children with mass media [1,2,3,4]. All of the public health evidence now points convincingly toward a strong link between the rise in obesity across European countries and the rise in childhood exposure to mass media. As paediatricians and child health experts, we see the urgent need, not only to identify the effects of mass media on the development of European children, but also to look for public health solutions that better integrate the current presence of media in a healthy physical, psychosocial, and behavioural health framework for parents and society.

In this consensus statement, the European Academy of Paediatrics (EAP) and the European Childhood Obesity Group (ECOG) address the specific link between mass media and childhood obesity in Europe and propose common action addressed to parents, paediatricians, politicians, industry aimed to a correct use of Mass Media.

Childhood obesity epidemiology

Childhood obesity has reached worrisome levels in most of the developed countries as well as in developing countries [5].

Data on prevalence of overweight/obesity in preschool age are scarce and difficult to interpret as they come from studies implemented in different years and often from samples that are not country representative. A recent review of existing data in 18 European countries showed that at the age of 4 years, overweight, including obesity, using IOTF references and cut-off points, prevalence ranges from 11.8% in Romania (2004) to 32.3% in Spain (1998-2000). In the recent data from Periscope study performed in Denmark, Poland, and Italy the prevalence of overweight and obesity in this age group was estimated from 14,6% in Denmark to 21.2% in Italy [6].

In recent decades, the prevalence of obesity in European school children and adolescents has increased at an alarming rate, to the point of becoming a major public health concern in European countries [5]. According to the World Health Organization's (WHO) European Childhood Obesity Surveillance Initiative, at least 15%-32% of European children are overweight, averaging 24% across European populations, with the trend continuing to rise [5,6,7,8]. The second survey, performed in 2010 in 13 European countries, shows that overweight, including obesity, ranges from 10.8% in 6 year old Belgian boys to 45.1% in 9 year old Greek boys; whereas obesity ranges from 2.8% in 6 year old boys to 14.7% in 9 year old boys respectively in Belgium and Greece, according IOTF definition. The survey shows also a positive trend from Northern countries to the Southern ones [8]. The same trend has been shown by the project Identification and prevention of Dietary- and lifestyle-induced health Effects in Children and InfantS (IDEFICS) study estimated the combined prevalence of overweight/obesity as ranging from more than 40% prevalence in southern Europe to less than 10% prevalence in northern Europe. Overall, the prevalence of overweight and obesity was higher in girls (21.1%) than in boys (18.6%) [10].

Mass media

Mass media are those means of communication that reach and influence large numbers of people, and, until the eighties, consisted especially in newspapers, popular magazines, radio and television. More recently, to the traditional media already listed, the so called "new media" have been added such as the Internet, podcasting, blogging, mobile phones, and others [11].

The new Mass Media provide not only a one-way communication from the sender to the recipient but also can provide an interactive communication between the sender and the recipient. The traditional media are generally limited to a national level, whereas the new media can easily reach a global audience in few seconds.

The Mass Media recipients, or "audience" as it is generally called, consist of a very large audience, with special characteristics, notably atomization or lack of social connections, which render it especially susceptible to the influence of modern mass-media techniques of persuasion such as advertising. Therefore, it can influence beliefs and behaviours of huge numbers of people in a very short time. This is more important when minors are involved as

their cognitive development is not complete and, of consequence, are more prone to be influenced by mass media [12,13,14].

Children's exposure to television and other screens

Today 98% of European households have home television, 68% personal computer, 66% Internet access at home and 90% mobile telephone. Therefore, a child enters into the world of mass media nearly at the moment of birth, if not earlier [15]. Children learn to interact with mass media early in life, with television, radio, magazines, newspapers, and an increasing number of interactive media surrounding their home life. In the first year of life children react to screen images with mimics and verbally. Infants are most attracted by music and colourful images, which are often present by advertisements. Toddlers spend an average of 1 hour a day watching television, and from the 4th year of life a child's exposure to other types of media expands dramatically, reaching an average of 7,25 hours a day exposure to television [14,16].

In a study performed in Greece the mean daily TV viewing time for children 1 –2 year old was 46.2 min/day whereas for children aged 3–5 years was 1.5 h/day. Moreover, 11% of children aged 1 –2 years and 32% of the children aged 3 –5 years exceeded the limit of no more than 2hours/day [17].

Data from a Dutch study performed in 5 years old children showed that 19.1% watched TV more than 2 hours/day. The authors found also significant differences on the time spent watching TV between normal weight children (18.4%) and overweight and obese children (25.7%) [18]. In the United Kingdom school children watch an average of 17h of TV (both children's and family) a week [19,20]. Data from the national survey "OKkio alla Salute" show that 35% of Italian children 8-9 year old watch TV and play videogames > 2 hours/day [21].

The results from the cross-sectional Health Behaviour in School-aged Children (HBSC) study conducted in adolescents from the Czech and Slovak Republics in 2010 (N=9,014; mean age=13.59) showed that 57.2% of adolescents in the Slovak Republic and 42.6% of adolescents in the Czech Republic had screen-based-activities for more than 6 hours/ day [22].

A UNESCO multicultural study of five thousand 12-year old adolescents from 23 countries representing different world regions varying in social development stages, culture, economic

and social conditions revealed that the pattern of exposure to mass media among children is similar globally. The survey found that 91% of children in the sample had access to a television set at home and that they spent a daily average of three hours in front of the TV set, which is at least 50% greater than with any other out of school activity, including homework [23].

Additionally, the increasing presence of these devices in children's and adolescence's bedrooms also increases the child's exposure to media 1 to 2 hours more a day [24].

Such huge amount of hours that children dedicate to TV watching and any other screen activity surely require attention from the scientific world because of the several consequences that children can experience. An international study with almost 300 000 children and adolescents found that watching between 1 and 3 hours of TV a day led to a 10% to 27% increase in risk of obesity. On the other hand some study suggests that that setting limits of TV viewing to between 1 and 1.5 hours a day may be more effective to prevent obesity than the 2 hours per day which were recommended by national scientific societies [25,26,27].

Parents' attitude on children's screen time

Despite such a high children's screen time, parents demonstrate little concern about children's screen-time habits [28,29].

Such parental attitudes are at odds with extensive evidence that demonstrates that excessive screen-time impacts children negatively and that parents active monitoring of screen-time is important for children's wellbeing [29,30].

Parental attitudes toward children's screen-time are influenced by parents' own television viewing practices, as well as by the perceived utility of television viewing in „babysitting“ or calming children, particularly when parents are engaged in household chores, or when their sleep schedules do not align with their children [28,29,30,31,32].

Obesity and television viewing

The link between obesity and mass media has been known since the early eighties of the 20th century [33]. Since then many researches have documented the influence of mass media on children's eating habits through many ways. One of the best documented impacts of mass media on children's health is an increased risk of overweight and obesity [14,16,17,18,19]. Many studies have revealed a positive correlation between time spent by children watching

television, increasing body mass index (BMI) increases and related unhealthy nutritional behaviour [12,13,18,19,20]. These studies include also longitudinal studies, which has demonstrated that increased time spent by children on television viewing is an independent risk factor that can be used to predict increased BMI [14,17,19,20]. A WHO study identified for the first time an association between the amount of time spent watching television and obesity among children aged 12–17 years [7]. In a large cross-sectional study of teenagers, it has been demonstrated a dose–response relationship, with a 2% increase in the prevalence of obesity for each additional hour per day of television viewing [11,12,13]. Viner and Cole suggested that television viewing in childhood is independently and causally linked to an increased adult body mass index [4]. Several studies have found that the association between television viewing and obesity remains significant when also taking into account potential confounding variables: socioeconomic status, familial predisposition to obesity, and, even, levels of physical activity [20,21,24,34,36]. Although a some of studies have produced not significant results, the null findings are most often attributed to limitations in defining and measuring time spent with screen media and not to a real absence of correlation [35].

Mechanisms and effects of TV food marketing

Information provided by electronic media, including television, occurs so quickly that there is no time for a critical analysis of the presented content and thus to create one's 'own' individual appreciation. This is especially true for children. Childhood obesity development is promoted not only by the amount of sedentary time watching Television, but also independently by the content of its programmes as well as by the content of web sites. Indeed, children who spend more time listening to music tend spend less time eating than those who watch television [26,27,28]. There are, thus, several different identifiable ways in which mass media contributes to childhood obesity.

1. Time spent watching television and childhood obesity.

The amount of TV viewing is directly related both to the type and the amount of food consumed. Television viewing tends to lead to poor overall diet quality[19,20,24]. Prolonged TV viewing time is associated with increased consumption of high-fat and high-sugar foods and hence increased daily energy intake in a Greek study [34]. Screen time has been found to be associated with consumption frequencies of energy-dense, micronutrient-poor foods also in a survey conducted in 5 European countries [35]. Increased TV viewing in children and adolescents is associated with reduced fruit and vegetable consumption, more snacking, and

increased intake of unhealthy foods together with a decreased intake of healthy foods [19,20,24, 26, 36]. Studies have also shown that children's energy intake while watching television can reach 20- 25% of their daily energy [19,20,25]. Time spent watching television influences children's nutritional knowledge as 70% of 6-8 year old children believe that fast-foods are more healthy than home-made food, and this misconception is statistically related to the amount of media exposure [19,33,37]. Television on during meals is related to worse eating pattern in the family, whereas television off during meals is correlated with a higher intake of fruit, vegetables in children from 8 to 11 years of age [38]. Last, but not least, adolescents frequently eating fast food use to watch more television than their peers [39]. In conclusion, it seems clear that television watching time significantly impacts, not only how much a child eats, but also the quality of foods and the timing of eating [24,25,26,27,28,31,36]. The same effects are produced by the time spent in using other electronic devices such as electronic games and DVD/videos use [40].

2. Food and beverages placement in movies and television programmes.

Food placement in movies and other programmes addressed or not specifically to children and adolescents is able to influence children's and adolescents' food choices. Food placement is much cheaper than advertising and movies with the new technologies can be viewed many times in different environments: cinema, home, computer, mobile, etc. multiplying the effects on food exposition [41].

3. Food advertising and childhood obesity

Children and adolescents are attractive target group as consumers: teenagers spend in USA \$155 billion/year; children younger than 12 years spend another \$25 billion; and both groups influence perhaps another \$200 billion of their parents' spending per year [42]. Every child in a Western country is estimated to watch about 40,000 commercials each year, of which approximately 4500-7500 are advertisements for unhealthy foods [42,43,44,45]. Data from Europe and the USA have shown that advertisers are targeting younger and younger children in an effort to establish 'brand-name preference' early on in a child's life [19,44,46,47,48].

The majority of foods and food products advertised to children in Europe and the USA are calorie dense as well as high in fats, sugars, and/or salt [19,45,47,48]. These well-advertised foods often sharply differ in their nutrient content from national and international public

health nutritional recommendations [36,38,41,42,43]. 2-8 years old children exposed to commercials during children's television programme revealed a significant tendency to choose food of brands which have been promoted during their viewing time, even after one short exposition [19,20,42,47]. It is particularly important that even a short (10-30 sec.) exposure to food advertising can influence food preferences of children 2-6 years of age and the effect doubles if the same advertising is shown twice during the same break in children 2-6 years of age [39]. Children watching embedded food commercials are significantly more likely to select the advertised product than children who have not seen the commercials [19,20,25]. Some studies show that obese children have knowledge of a greater number, and a greater proportion, of TV food advertisements compared with non-food TV advertisements. They also remember more TV food advertisements than children in a normal weight range [24,25,26,27].

The effects of food advertising are not limited to food intake, but higher the number of commercials watched, greater the number of purchase-influencing attempts directed at parents in the supermarket by children from 3 to 11 years of age [33]. All in all, results of the studies suggests that the number of advertisements children view has a direct impact on children's food choices and their purchasing requests.

4. Quality of Food advertising and importance of branding

Food companies and advertisement agencies often go beyond advertising alone to entice children as consumers and develop brand loyalty: this includes developing advertising campaigns that include advantages for buying larger quantities or gadgets, such as 'free' stickers or toys. Repeated consumption is also encouraged by developing series and collections of food products advertised to children. Video games, cuddly toys, teddy bears, and other animated characters implemented in cross-promotions link food products with popular film characters and leading sports figures, encouraging children to buy foods associated with cultural icons: the same characters or personalities that are present on TV screens are reproduced on cereals, chocolates, chips, and other often unhealthy food [47,48,49,50,51].

Several studies have shown that children prefer the taste of food and drink items displaying a well-known brand packaging to identical products in matched, but unbranded, packaging [46,47,51,52]. Overweight children consume much more energy from branded foods than from not branded generic ones suggesting that overweight children can be more sensitive to

food branded marketing strategies [51,52]. This behaviour can be explained by a study that used functional neuroimaging techniques to assess which cerebral areas are involved when children watch advertising showing a logo. Compared with normal weight children, obese children show a greater activation in the older reward cerebral regions such as the postcentral gyrus and midbrain when exposed to food logos vs baseline, whereas healthy weight children show a greater brain activation in the middle frontal gyrus and middle temporal gyrus, which are associated with cognitive control and self-control. The fact that obese children show significantly less brain activation than healthy weight children in cerebral areas associated with cognitive control could explain why obese children may be more vulnerable to the effects of food advertising [52,53].

5. Mass media use and sleep pattern

TV and other media displace or disturb young people's sleep patterns. Studies of infants, older children and teenagers have found that subjects with higher social media use or who sleep with mobile devices in their room were at greater risk for sleep disturbances [54,55,56]. Poor or deregulated sleep affects the regulation of energy balance and can be one of the important risk factor of development childhood obesity. Results from preschool-aged children who eat dinner with their parents, got adequate sleep, and had limited screen-time hours had a 40% lower prevalence of obesity than those exposed to none of these routines [56] .

Internet and new media

In recent years computer mediated communication has emerged as a leading means for consumers and advertisers and marketers have begun to target the rapidly growing number of children owning a mobile and an internet account with a variety of new interactive online advertising and marketing techniques. A majority of the big companies that advertise and market to children have created their own websites, facebook profiles, and others designed as "branded environments" for children. These sites include games, word-find puzzles, contests, quizzes, riddles, music, e-mail cards, clips of commercials, sweepstakes, downloadable recipes, desktop wallpaper and screensavers that feature their products, and on-line stores that sell licensed merchandise. Approximately 1.2 million children aged 6–11 years visited food company–sponsored advertisement game sites every month in 2009, spending up to 63 minutes per month on one site [35,45,46].

Children can also sign up to receive electronic newsletters with news about products and promotions. Food companies had often their own Facebook and MySpace pages, links to Twitter accounts, dedicated portions of YouTube, and used other popular social media sites. Websites often included solicitations to “invite a friend” or “share with a friend”; in one case, a site urged advergaming players to enlist friends through Facebook and Skype. Food marketers also used word-of-mouth techniques – recruiting consumers as “ambassadors” of the brand. Word-of-mouth techniques were most often directed to teens [57,58].

Mobile phones

Data on availability of mobile phones among European children are scarce. The 17.6% of Italian children receive a mobile phone at or earlier than 7 years of age; 38.8% at 8-10 years of age and 5.6% at 11 years [59]. In UK 1 in 50 children 5-7 years of age and 1 in 8 among children aged 8-11 years owns a smartphone[60].

Around 37% -50% of US children aged 10–12 years have an account in social networks [16]. One of the newest forms of marketing enables food companies to reach young people on their mobile devices (cell phones, tablets, and iPods) through text messages, e-mails, social networks, and mobile apps, including advergaming. Fast-food, soda, energy drink, snack food, and candy companies were early adopters of mobile marketing to appeal to youth [57,58].

Advertising through mobile phones is much cheaper for food industry as compared to television advertising or food placement. In addition, food industry through interactivity at their web sites, can get, from their own customers, new customers.

Food advertising through The Internet and mobile phones.

The higher level of interactivity present in the internet food marketing makes food marketing itself effective in promoting food brand awareness and branded products purchase[61].

A number of studies assess the effectiveness of advergaming in promoting the advertised food intake and they all confirm the advergaming is effective in promoting food intake [62,63,64]. As a cherry on the cake, it is more difficult for children to recognize advertisements on web sites and pages as compared to those seen on television as on the web advertisements are not isolated from the programme and grouped together as it happens in television making them, eventually in the future, even more tricky than the traditional advertising aired on television as

they are financially more convenient for the food industry and at the same time extremely more difficult to be limited and controlled by national policies and legislation [65,66].

Media as tool to promote health.

During the recent years the possible positive role of using the new media to promote health has been studied. Some study has considered the role of mobile phones to promote healthy nutrition [67]. However, The Internet programs and mobile phones have been proposed mostly to treat obesity and other chronic diseases as these devices may overcome traditional barriers to weight loss treatment due to 24 hour a day accessibility, affordability, and anonymity for those who may avoid seeking treatment due to embarrassment or other reasons. Into this media it is possible to provide a forum for social support through e-mail, bulletin boards, chat rooms, group forums, and web-hosted meetings. New media can minimize inconveniences associated with clinic visits, particularly time spent in waiting rooms, and has the potential to be used in a broad range of settings to optimize health outcomes for patients [68,69,70].

Self-Regulations and legislation on Advertising to Children

Food advertising and promotion can be regulated either by governments through legislation and/or by official guidelines, or by the industry through self-regulation and voluntary initiatives, or both. The common practice in Europe today is a mix of both, regulatory and voluntary approaches. In the United Kingdom, Greece, Denmark, and Belgium, advertising to children is restricted. In Sweden, and Norway advertising to children under the age of 12 is illegal [71,72]. The European Union also has introduced minimum provisions on advertising to children for its 27 member States. Article 9 point 2 of Directive 2010/13/EU of the European Parliament and of the Council of 10 March 2010 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning

the provision of audiovisual media services (Audiovisual Media Services Directive) provide a first attempt to protect children against advertisements for unhealthy foods and drinks in children's programmes. It states the following: *Member States and the Commission shall encourage media service providers to develop codes of conduct regarding inappropriate audiovisual commercial communications, accompanying or included in children's programmes, of foods and beverages containing nutrients and substances with a nutritional or physiological effect, in particular those such as fat, trans-fatty acids, salt/sodium and sugars, excessive intakes of which in the overall diet are not recommended* [73].

The Directive introduces some general rules for advertisements directed at minors: protecting children from direct exhortation to buy certain products or from attempts at exploiting their trust in important persons, but it doesn't directly outlaw all advertisement of inappropriate foods nor does it provide certain rules considering the type of food or extent of promotion of nutritional habits. Instead of creating clear European food advertisement policy, the Directive shifts the responsibility for creating codes to the broadcasting companies, without requiring cooperation with health professionals and/or public health administrations when creating these codes. The majority of regulations that have been implemented concern only television and direct school advertisements, leaving the large open spaces of internet, sponsorships, and cross-promotions nearly entirely unregulated, even un-codified.

In European countries, as well as in the US, mutual social and industrial commissions dominate when it comes to creating marketing codes. This is the so-called self-regulatory system, which in fact constrains the development of governmental statutory regulations, despite strong advocacy by public health and consumer groups. Usually such self-regulatory institutions are funded and administered by the industry. From a global perspective regulations are nearly nowhere to be found in middle- and low income countries, leaving completely open the kind, manner, and amount of children-targeted advertisements in those countries. The major barrier in developing regulations to discourage marketing that promotes unhealthy dietary practices has resulted in a lack of clarity on the standards and rules, level of evidence, and of available support to develop regulations [71,72].

Although statutory regulation may be slow to develop in and of itself, lawmakers are also hampered by industry lobbies that deflect public health arguments and promote their own economic interests. Some industry players consider advertising as a "minor factor" in food choices and promote the idea that that children, as consumers, have a right to obtain product information from advertising. They argue that the industry is itself best placed to implement

limits on advertising and that government regulation will only hinder the consumer choice of children. Large food companies participate in a number of different voluntary initiatives and pledges at the global, regional, and country levels. A number of codes exist that cover general principles of marketing products to children, including two that address food and beverage marketing and that have been introduced already a decade ago [71,72,73]. Results of those self-regulations of marketing activities suggests that they are in general more flexible and better aligned with specific conditions in the respective companies or industries – making it more cost-effective and acceptable by industry – self-designed self-restrictive policies do put an enormous responsibility on industry’s (and their federations and lobby groups) shoulders [74,75,76].

This is clear to the eyes of every expert involved in this field, and many authorities, Scientific societies, and NGOs (non governmental organisations) claim to have National and European Institutions develop a legislation in this field, but food industry is hardly working to inhibit this decision.

In fact, an European legislation on this topics **is** not easy to achieve because the World Trade Organization and the European Union rest on the principle that trade liberalization is conducive to economic growth and prosperity. Obesity prevention policies are clearly against these principles as their principal aim is a reduction of unhealthy food intake. The “right” of free trade, however, can be derogated when the principle of public health protection is on the agenda [72,73,74]. Governments, thus, may restrict the free movement of goods or services to counteract childhood obesity. As paediatricians and child health experts we consider children’s protection as a priority as compared with economic interests. The governments, thus, must find a way to protect children’s health as children are particularly vulnerable [77].

Considerations for actions to be taken by the health care systems in different settings.

Family.

Health care professionals are in a special position to educate parents and children about challenging social and health issues connected to digital and classical media. They should encourage parents to monitor, not only time spent by their children with mass media, but also the content of viewed broadcasts. Parental monitoring of television viewing has indeed been shown to have a protective effect on the time spent watching TV and the development of childhood obesity in a longitudinal study in middle childhood [30]. This shows that child

media time has direct effects on BMI, is under substantial control by parents, and therefore is a prime target for family intervention. The process of creating media literacy should be introduced to standards of health promotion services delivered to families by the health workers. It is essential to promote the watching of media by parents and children together, and to help children to create abilities to filter the informational flood, to analyse critically what they view, and to discuss the meaning of the information they receive. Parents should be advised not to allow children to have mass media devices in their bedrooms, especially television and unlimited access to the internet.

It is essential that paediatricians encourage families to talk to children about online usage and to enhance their supervising of online activities as opposed to using electronic blockades or spying applications (like V-chip and parental control systems), which are less effective and may result in worsening communication processes within the families.

A list of recommendations for parents for a proper use of television and other mass media is available in box n.1

Box n.1 Recommendations to parents for proper use of television and other mass media in the family.

1. Do not allow the use of television, cellular phones computer, and other similar devices for children younger than 4 years;
2. Limiting the hours of television, computer and similar devices for children over 4 years to no more than 1.5 hour a day;
3. Do not allow the TV in the children's bedroom;
4. Turn off the TV during meals and during the homeworks time;
5. Be aware of the content of the programs watched by children and of the web sites children open and play with;
6. Look and comment with the children's their favorite programs and encourage them to be critical readers of all mass media messages;
7. Turn off the TV during commercials or at least remove the audio during commercials and set "parental control" on web sites that promote junk food;
8. Discuss with the children the meaning and purpose of commercials wherever they are aired;

9. Don't give in property cellular phones to children until they are at least 12 years old;
10. Become positive role models by reducing the parents themselves the hours of television and of The Internet connection.

Paediatricians.

Paediatricians should learn how to use the media in their own professional life and have a focus on their effects on children's life. Checking routinely the relationship of the family and the child or the adolescent with television and the new media is now essential to get a whole and complete idea of the child's and family's life style. A list of recommendations addressed to paediatricians for a proper investigation on the use of use of television and other mass media in the family is available in box n2.

Box n 2. Recommendations for Paediatricians

1. Routinely ask parents about their media use in the family.
2. Inform the parents about the general risk of mass media using by children on their cognitive and physical development.
3. Give advices to the parents how to decrease television and new media use of their children.
4. Ask directly to the adolescents about their use of media.
5. Do not "criminalize" the use of mass media but educate the adolescents how to safely use them.
6. Promote adherence to guidelines for health diet, adequate physical activity and sleep in children and their parents. This last recommendation is not related to media and then is not coherent to the topic of the paper.

Schools

Children spend a large part of their weekday day in the school environment, and these environments influence both the child and the local community. Schools are thus an environment of central concern when considering childhood health, and childhood obesity in particular. In the last decades, marketing companies have developed strategies that also focus attention on schools and children's food consumption. Companies employ various types of direct advertising in schools, such as corporate logos on athletic scoreboards, sponsorship banners in gyms, ads in school newspapers and yearbooks, free textbook covers with ads, and

screen-saver ads on school computers for branded foods and beverages. Food advertisements can also be delivered into school media. Corporate food advertising in schools also includes corporate-sponsored educational materials or corporate-sponsored incentives and contests.

Research shows that well-designed, well-implemented school programs can effectively promote physical activity and healthy eating [78,79,80].

Schools, however, also have the possibility to play a critical role in reshaping social and physical environments, providing information, tools, and practical strategies that could help students adopt healthy lifestyles. More than 95% of young people are enrolled in schools. Schools should seek possibilities to initiate preventive and educational programmes, enhancing the cognitive competences of children and enlightening their attitudes with regard to all kind of mass media starting at kindergartens.

As part of their overall education goals, schools provide an ideal setting for teaching young people how to adopt and maintain a healthy lifestyle, including developing critical attitudes towards media and its advertisements and promoting conscious decision-making in connection with healthy diet habits. Schools programmes can easily include lessons on how to stimulate children to recognize advertisings from the programmes and to understand the real goal of advertisings. Also teachers should encourage children to evaluate the reasons why specific foods are placed in movies. Children should also be thought that respect of privacy is a value and that providing friends' names to web sites is not a correct behaviour. Last teachers should stimulate children to reduce their screen time spent at television as well as at computer and mobile phones.

A list of recommendations addressed to teachers for teaching a proper use on the use of use of television and other mass media to children and adolescents is available in box n3.

Box n3 Recommendations to teachers

1. Assess the use of television and new media by the children and the adolescents attending their classes.
2. Invite students to reduce their screen time in favour of "human contacts".
3. Help the students to identify advertisings' and especially food advertisings' real aims.
4. Stimulate the students how to decode advertising messages.
5. Educate students to correctly use The Internet and all its tool, including advergimes.

6. Recommend students to respect others' privacy.

Community level

At the European and national levels, it is essential to educate society and stakeholders regarding the impact of an uncontrolled and excessive exposure of children to the potentially harmful influence of mass media. One could consider an unrestricted exposure of children to advertisement in mass media as a form of emotional abuse and neglect, raising the importance of introducing mandated regulations that protect children from inappropriate advertising that adversely affects child health. There is a need for European regulation within the European "health in all policies" strategy that takes into account the variety of mass-media influences. The invention and development of new communicative technologies should attract government attention and lead to health promoting programmes in a globalised media environment. Health protection policies should also include the provision of scientific information regarding potential health hazards connected with mass media exposure and also be worthwhile to analyse the potential benefits of introducing health protecting regulations for internet, especially with regard to the content presented on blogs and social media [81].

Conclusions

Media play an important role in the current epidemic of childhood and adolescent obesity. There are many fields in which mass media can influence the developing of obesity in children. It is essential to encourage parents and children to discuss and to help children to create abilities to filter the information flood, to analyse critically and to discuss the meaning of information. Parents should be advised not to allow children to have mass media devices in their bedroom, especially television and unlimited access to the internet. Paediatricians ought to encourage whole families discussions about web use and enhancement of online activities supervision as opposed to electronic blockades or spying applications, which are less effective and may result in worsening communication within the families. Possibilities to initiate preventive and educational programmes enhancing cognitive competences of children and raising their awareness about using mass media should be sought at community levels.

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