

COMMITTEE REPORT

Reviewing and addressing the link between mass media and the increase in obesity among European children: The European Academy of Paediatrics (EAP) and The European Childhood Obesity Group (ECOG) consensus statement

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INTRODUCTION

Today's children are born into a world of mass media, including purely passive forms and interactive forms, such as gaming or social media. The role of mass media in childhood development has been studied by paediatricians and other child health experts for some years. Mass media has been shown to have a broad effect on children's health and can affect them physiologically and have an impact on their socio-cultural functioning and psychological well-being. Many studies have shown associations between rising childhood obesity and exposure to mass media, and public health evidence has pointed towards a strong link between these two factors in Europe. Paediatricians and child health experts have an urgent need to identify the effects of mass media on the development of European

Abbreviations

BMI, Body mass index; EAP, European Academy of Paediatrics; ECOG, European Childhood Obesity Group; TV, Television.

ABSTRACT

This study reviewed the link between social media and the growing epidemic of childhood obesity in Europe. A task force from the European Academy of Paediatrics and the European Childhood Obesity Group searched published literature and developed a consensus statement. It found that there was evidence of a strong link between obesity levels across European countries and childhood media exposure and that parents and society needed a better understanding of the influence of social media on dietary habits.

Conclusion. Health policies in Europe must take account of the range of social media influences that promote the development of childhood obesity.

children and advocate for public health solutions that integrate media into 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 links between mass

Key notes

- A task force from the European Academy of Paediatrics and the European Childhood Obesity Group reviewed the links between social media and the growing epidemic of childhood obesity in Europe.
- It found that there was evidence of a strong link between obesity levels across European countries and childhood media exposure.
- The findings demonstrate that parents and society need a better understanding of the influence of social media on dietary habits.

media and childhood obesity in Europe. The statement also proposes common actions to be addressed by parents, paediatricians, politicians and industry, in order to develop the correct use of mass media by children in Europe.

CHILDHOOD OBESITY EPIDEMIOLOGY

Childhood obesity has reached worrying levels in most developed and developing countries according to the World Health Organization (WHO) (1). Data on the prevalence of overweight and obesity at preschool age are scarce and difficult to interpret as they come from studies that focus on different ages, and the samples are frequently not nationally or regionally representative. Based on International Obesity Task Force (IOTF) references and cut-off points published by Cole et al. in 2000 (2), the prevalence of overweight, including obesity, at four years of age ranged from 11.8% in Romania (2004) to 32.3% in Spain (1998–2000) in data collected from 18 European countries (3). Data from the PERISCOPE study, performed in Denmark, Poland and Italy, showed that the prevalence of overweight and obesity in the same age group ranged from 14.6% in Denmark to 21.2% in Italy (4).

In the last 25 years, the prevalence of obesity in European school children and adolescents has increased at an alarming rate, to the point where it has become a major public health concern in European countries, according to estimates from the WHO's Health Behaviour in School-aged Children survey (5). This survey reported that the average percentage of overweight and obese children was 19% in Europe, with a higher trend in southern Europe (5). An earlier survey, performed in 2010 in 13 European countries, showed that the prevalence of overweight, including obesity, ranged from 10.8% in six-year-old Belgian boys to 45.1% in nine-year-old Greek boys using the IOTF definition and that the obesity rates on their own accounted for 2.8% and 14.7%, respectively (6). Both of the prevalence percentages, namely overweight, including obesity, and obesity on its own showed a contrast between northern and southern Europe (6). The same trend was shown by the Identification and Prevention of Dietary and Lifestyle Induced Health Effects in Children and Infants study (7), which estimated that the combined prevalence of overweight and obesity ranged from more than 40% in southern Europe to less than 10% in northern Europe, and the overall prevalence of overweight and obesity was higher in girls (21%) than in boys (19%).

MASS MEDIA

Mass media are a means of communication that reach and influence large numbers of people and, until the 1980s, they consisted mainly of newspapers, popular magazines, radio and television (TV). More recently, these have been joined by new media, such as the Internet, podcasting, blogging, smartphones and social media. This new mass media can provide one-way communication from the sender to the recipient, but it can also enable interactive communication

between both parties. Traditional media generally operates on a national basis, such as TV, papers and state-funded broadcasting sites, while new media can easily reach a global audience in a few seconds.

Mass media audiences are very large and have special characteristics, notably a lack of social connections, which make them particularly susceptible to the influence of modern mass media persuasion techniques, such as advertising (8). Therefore, mass media can influence the beliefs and behaviours of a very large number of people over a very short period of time. This is even more important when children and adolescents are involved, as their cognitive development is not complete and, as a result, they are more likely to be influenced by mass media (8).

CHILDREN'S EXPOSURE TO TV AND OTHER SCREENS

Today 97% of European households have a TV in their home, 72% have a personal computer, 68% have Internet access at home and 91% have mobile phones (9). Therefore, a child enters into the world of mass media almost as soon as they are born. Children learn to interact with mass media early in life, mostly with TV, radio and the increasing range of interactive media linked to their home life. Within the first year of life, children react to screen images by mimicking and saying what they see and hear. Infants are most attracted by music and colourful images, which are frequently featured in advertisements. Toddlers spend an average of one hour a day watching TV and, from the fourth year of life, a child's exposure to other types of media expands dramatically, reaching an average of 7.25 hours a day watching TV (8). A Greek study found that the mean daily TV-viewing time for children aged one to two years old was 46.2 minutes per day, whereas for children aged three to five years, it was 1.5 hours per day. This study also noted that 11% of children aged 1–2 and 32% aged 3–5 exceeded the widely suggested limit of no more than two hours per day (10). Data from a Dutch study of five-year-old children found that 19.1% watched TV for more than two hours a day, and the authors also found significant differences in the average time that normal weight children (18.4%) and overweight and obese children (25.7%) spent watching TV (11). A 2011 study from the United Kingdom found an average of 28.2 advertisements per TV-viewing hour, with one-third of them promoting food items (12). Data from the Italian national survey OKkio alla Salute showed that 35% of children aged 8–9 watched TV and played video games for more than two hours per day (13). The results from the cross-sectional Health Behaviour in School-aged Children study, conducted among 9014 adolescents with a mean age of 13.6 years in 2010, showed that 57.2% of adolescents in the Slovak Republic and 42.6% of adolescents in the Czech Republic engaged in screen-based activities for more than six hours per day (14).

A United Nations Educational Scientific and Cultural Organization multicultural study of 5000 12-year-old adolescents from 23 countries, representing different world regions with varying stages of social development and

cultural, economic and social conditions, revealed that patterns of exposure to mass media among children were becoming similar across the globe (15). This study reported that 91% of children had access to a TV set at home and they spent an average of three hours per day watching it, which was at least 50% greater than any other out of school activity, including homework (15). A study by Dennison et al. showed that the increasing presence of these screen devices in children's and adolescents' bedrooms has increased the average exposure to media by an additional one to two hours per day (16). The huge amount of hours that children dedicate each day to watching TV and other screen activity surely deserves attention from the scientific world, because of the many consequences that children can experience as a result, particularly with regard to younger children. Some studies have suggested that setting limits for TV viewing of between one and 1.5 hours a day may be more effective in preventing obesity than the limit of two hours per day that is recommended by some national scientific societies (17,18).

PARENTS' ATTITUDES TO CHILDREN'S SCREEN TIME

Even though children have such high levels of screen time, most parents demonstrate little awareness of their children's screen-time habits (19). Such parental attitudes are at odds with the extensive evidence that demonstrates that excessive screen time has a negative impact on children's health and that it is important for children's well-being for parents to actively monitor their screen time (19,20). Parental attitudes towards their children's screen time are influenced by their own TV-viewing practices, as well as by their perceived use of TV viewing as a way of babysitting or calming children, particularly when parents are engaged in household chores or when their sleep schedules differ from their children's sleeping patterns (19,20).

OBESITY AND TV VIEWING

The link between obesity and mass media has been known since the early 1980s and many studies have documented the influences of mass media on children's eating habits, including the increased risk of overweight and obesity (8,10,12,14,16–21). In 1985, Dietz and Gortmaker were among the first researchers to question the links between the amount of time spent watching TV and obesity among children (22). Many studies have revealed a positive correlation between the time children spend watching TV with an increasing body mass index (BMI) and unhealthy nutritional behaviour (11,12,23). These have included longitudinal studies that have demonstrated that the increased time spent by children viewing TV is an independent risk factor that can be used to predict increased BMI (8,10,12,23). In another study, it has been suggested that TV viewing in childhood is independently and causally linked to an increased adult BMI (24). Several studies have also found that the association between TV viewing and obesity remained significant when potential

confounding variables were taken into account, namely socioeconomic status, a family predisposition to obesity and even levels of physical activity (12,13,16,25,26). Although some studies have not produced significant results, null findings may be attributed to limitations in defining and measuring time spent with screen media and not to the real absence of correlation (27).

MECHANISMS AND EFFECTS OF TV FOOD ADVERTISING

Information provided by electronic media, including TV, occurs so rapidly that there is no time to form an individual appreciation of the presented content by carrying out a critical analysis. This is particularly true for children. Childhood obesity development is not just promoted by the amount of sedentary time spent watching TV, but independently by the content of the programmes. The same is also true for the content provided by websites. Indeed, children who spend more time listening to music tend to spend less time eating than those who watch TV (17–19). Thus, there are several different identifiable ways in which mass media can contribute to childhood obesity.

TIME SPENT WATCHING TV AND CHILDHOOD OBESITY

Firstly, the amount of TV viewing is directly related to both the type and the amount of food consumed. TV viewing tends to lead to a poor quality overall diet (12,16,23). For example, one Greek study found that prolonged TV-viewing time was associated with the increased consumption of high-fat and high-sugar foods and, therefore, increased daily energy intake (25). A survey of five European countries also found that screen time was associated with more frequent consumption of energy-dense, micronutrient-poor foods (26). Increased TV viewing in children and adolescents has also been associated with reduced fruit and vegetable consumption, more snacks and the increased intake of unhealthy foods in conjunction with a decreased intake of healthy foods (12,16,17,23,26). Studies have also shown that children's energy intake while watching TV can account for 20–25% of their daily energy (12,21,23). Time spent watching TV influences children's nutritional knowledge, as one study reported that 70% of children aged six to eight years believed that fast foods were healthier than home-made food, and this belief may have been statistically related to the amount of media exposure (23). Leaving the TV on during meals has been related to worse family eating patterns, whereas switching the TV off during meals has been correlated with a higher intake of fruit and vegetables in children (28). Last, but not least, adolescents who frequently eat fast food have been shown to watch more TV than their peers (29). In conclusion, it seems clear that the time spent watching TV has a significant impact on how much a child eats and the quality and types of food and eating habits (16–19,21,26). The same effects are produced by time spent using other electronic devices, such as electronic games, and watching DVDs or videos (30).

FOOD AND DRINK PLACEMENTS IN FILMS AND TV PROGRAMMES

Food and drink placements in films and TV programmes can influence children's and adolescents' food choices, even if they are not specifically aimed at these age groups. These refer to products that are visible in the film footage, for example a character drinking a branded soda, and they are much cheaper for companies than traditional advertising. These can be viewed many times in different environments, multiplying the effects of exposure, for example at the cinema or at home, and on the computer and mobile phone (S31).

FOOD ADVERTISING AND CHILDHOOD OBESITY

Children and adolescents are an attractive target consumer group. Teenagers spend 155 billion US dollars per year in the United States and children younger than 12 years of age account for another 25 billion US dollars per year, with both groups influencing perhaps another 200 billion US dollars of parental spending per year (S32). 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 (S32, S33). Data from Europe and the United States show that advertisers are targeting children of increasingly younger age to establish brand-name preferences early in a child's life (S34).

Most foods and food products advertised to children in Europe and the United States are calorie dense, as well as high in fats, sugars and, or, salt (S33). These well-advertised foods often differ sharply from the nutritional recommendations of national and international public health organisations (S33). Children aged 2–8 who are exposed to commercials during children's TV programmes have been reported to demonstrate significant tendencies to choose food brands that have been promoted during their viewing time, even after just one short exposure (S32). For example, a study of children aged 3–11 found that the higher the number of commercials they watched, the more times they tried to get their parents to buy certain products when they visited supermarkets (S35). These studies suggest that the number of advertisements children view has a direct impact on their food choices and the foods they ask their parents to buy.

QUALITY OF FOOD ADVERTISING AND THE IMPORTANCE OF BRANDING

Food companies and advertising agencies often entice children to become consumers and create brand loyalty by developing advertising campaigns that include incentives for buying larger quantities of products or gadgets, such as free stickers or toys. Repeated consumption is also encouraged by developing series and collections of food products that are advertised to children. Video games, cuddly toys, teddy bears and other animated characters are used to promote foods. Linking food products, such as cereals, chocolates, crisps and other less healthy food products,

with popular film characters and leading sports figures encourages children to buy these foods, as they recognise these cultural icons from their TV screens (S36–S39).

Several studies have shown that children prefer the taste of food and drink items in well-known brand packaging to identical products in matched, but unbranded or generic packaging (S34, S39, S40). Overweight children consume much more energy from branded foods than from non-branded or generic ones, suggesting that they can be more sensitive to food branded marketing strategies (S39, S40). This behaviour can be explained by a study that used functional neuroimaging techniques to assess which cerebral areas were involved when children watched advertising that featured a logo. Compared with normal weight children, obese children showed greater activation in the suggested reward cerebral regions, such as the postcentral gyrus and midbrain, than in the baseline measurements when they were exposed to food logos (S40). In contrast, healthy weight children showed greater brain activation in the middle frontal gyrus and middle temporal gyrus, which are associated with cognitive control and self-control (S40). The fact that the obese children in these functional studies showed significantly less brain activation than healthy weight children in the cerebral areas associated with cognitive control could partly explain why obese children may be more vulnerable to the effects of food advertising (S40).

MASS MEDIA USE AND SLEEP PATTERNS

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 slept with mobile devices in their room were at greater risk of sleep disturbances (S41, S42). Poor or deregulated sleep affects the regulation of energy balance and can be an important risk factor for the development of childhood obesity. Results from a study on preschool-aged children who ate dinner with their parents had adequate sleep and had appropriate limits set on screen-time hours showed a 40% lower prevalence of obesity than those exposed to none of these routines (S42).

INTERNET AND NEW MEDIA

The development of mobile technology-based communication has encouraged advertisers and marketing experts to target the rapidly growing number of children with smartphones or access to the Internet with a variety of interactive online advertising and marketing techniques. Large companies that advertise and market to children have created their own websites and Facebook profiles and others have designed branded environments for children. These sites include games, word-find puzzles, contests, quizzes, riddles, music, e-mail cards, advertisements, sweepstakes, downloadable recipes, desktop wallpaper and screensavers that feature their products and online stores that sell their licensed merchandise. Children can also sign up to receive

electronic newsletters with news about products and promotions. Food companies frequently have their own Facebook and MySpace pages, links to Twitter accounts, dedicated YouTube sections and use other popular social media sites. Websites often include invitations to invite a friend or share with a friend. In one case, a site run by a company that sells food products provided games and urged visitors to enlist their friends through Facebook and Skype. Food marketers have also used word-of-mouth techniques that recruit consumers as brand ambassadors, and two studies reported that these techniques were most commonly directed at teens (S43, S44).

SMARTPHONES

Overall data on the availability of mobile phones owned by European children are scarce. About 17.6% of Italian children up to seven years of age have been reported to have a smartphone, as were 38.8% of those aged eight to 10 years and 5.6% of those aged 11 years (S45). In the United Kingdom, it has been reported that 2% of children of five to seven years of age and 12.5% of children aged eight to 11 years owned a smartphone (S46). Overusing or becoming addicted to smartphones has been shown to reduce face-to-face contacts in adolescents and increase behavioural and social problems that may lead to depression and sleep problems, which are well-known obesity risk factors (S47).

Newer forms of marketing enable food companies to reach young people on their mobile devices such as smartphones, tablets and portable media players through text messages, e-mails, social networks, mobile apps and games. Fast food, soda, energy drinks, snack foods and sweet manufacturers were among the first to adopt mobile marketing methods to appeal to young people (S43).

FOOD ADVERTISING THROUGH THE INTERNET AND SMARTPHONES

Higher interactivity in Internet food marketing means it is more effective with regard to promoting food brand awareness and encouraging the purchase of branded products (S48). The number of sites using advergaming, which integrate advertising and video games, is growing. Some are sponsored by companies and include advertisements, and some are created with the sole purpose of promoting the company or its product. The free distribution of such games can be a powerful marketing tool. A study by Folkvord et al. assessed the effectiveness of advergaming in promoting the consumption of advertised food and confirmed that advergaming is effective in promoting food intake (S49).

It is more difficult for children to recognise advertisements on the Internet compared to TV, as web advertisements are not grouped together and shown between programmes as they are on TV (S50). In the future, it will be even more difficult to control web advertising than traditional TV advertising, as the former are cheaper for the food industry to create and harder to control through national policies and legislation (S50).

USING THE MEDIA AS A TOOL TO PROMOTE HEALTH

The possibilities of using new media to positively promote health have been studied and these have included how smartphones can be used to promote healthy nutrition (S51). However, most of the suggestions for Internet programmes and smartphone applications have focused on treating obesity and other chronic diseases. The reason for this is that these devices may overcome traditional barriers to weight loss treatment, as they are accessible 24 hours a day, are affordable, and they offer anonymity for those who may wish to avoid publicly seeking treatment due to embarrassment or other reasons. New media can provide a forum for social support through e-mail, bulletin boards, chat rooms, group forums and web-hosted meetings. New media can also minimise the inconvenience associated with clinic visits, particularly time spent in waiting rooms, and has the potential to be used across a broad range of settings to optimise health outcomes for patients.

SELF-REGULATION AND LEGISLATION ON ADVERTISING TO CHILDREN

Food advertising and promotion can be regulated by either government legislation, official guidelines or industry through self-regulation and voluntary initiatives. The most common practice in Europe today is a mix of both these regulatory and voluntary approaches. The United Kingdom, Greece, Denmark and Belgium have restrictions with regard to advertising to children, and in Sweden and Norway, advertising to children under the age of 12 is illegal (S52). The European Union has also introduced minimum provisions on advertising to children for its 27 member States and has provided a first attempt to protect children from advertisements promoting unhealthy foods and drinks during children's programmes (S53). The Directive that has been produced says that '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' (S53). The Directive also introduces some general rules for advertisements directed at children. It protects children from being directly encouraged to buy certain products or from attempts to exploit their trust in celebrities, but it does not directly outlaw all advertisements of inappropriate foods. In addition, it does not provide specific rules about the types of food or the extent of the promotion of nutritional habits. Instead of creating a clear European food advertisement policy, the Directive shifts the responsibility for creating codes to the TV broadcasting companies, without requiring the cooperation of health professionals and, or, public health administrations when creating these codes. The majority of the regulations that have been implemented

only concern TV and direct school advertisements, leaving areas such as the Internet, sponsorship and cross-promotions almost entirely legally unregulated.

In European countries, as well as in the United States, mutual governmental and trust commissions play a dominant role when it comes to creating marketing codes. This so-called self-regulatory system may have the effect of constraining the development of governmental statutory regulations, despite strong advocacy for them by public health and consumer groups. Usually, such self-regulatory institutions are funded and administered by the industry. Statutory or self-regulatory systems do not usually exist in middle-income and low-income countries, which means there is no control on the type, manner and amount of advertisements targeted at children within those countries. These major barriers have hindered the development of statutory regulations to discourage marketing that directly or indirectly promotes unhealthy dietary practices to children. They have resulted from a lack of clarity on the standards, rules, levels of evidence and on the lack of available support to develop these regulations at national and international levels (S52).

Although it takes a long time to develop statutory regulations, lawmakers are also hampered by industry lobbies that deflect public health arguments and promote their own economic interests. Some industry players consider that advertising plays a minor role in food choices and they promote the idea that children, as consumers, have a right to obtain product information from advertising. They argue that the industry is in the best position to implement limits on advertising and that government regulations will only hinder children's choices as consumers. Large food companies participate in a number of different voluntary initiatives and pledges at global, regional and national levels. A voluntary code exists that covers general principles of marketing products to children, including food and beverage marketing that was introduced by the WHO in 2010 as part of a set of recommendations (S52). The results of self-regulation of marketing activities suggest that they are generally more flexible and better aligned to the specific needs of particular industries, making them more cost-effective and acceptable by those industries. These self-designed, self-restricted policies put enormous responsibility on the shoulders of specific industries and their federations and lobby groups, but they are nonstatutory (S54).

Clearly many authorities, scientific societies and non-governmental organisations encourage national and European Institutions to develop legislation in their fields, but the food industry may oppose this on fair trade grounds.

In fact, developing European legislation to cover the food industry is difficult to achieve, because the World Trade Organization and the European Union rely on the principle that trade liberalisation is conducive to economic growth and prosperity. Obesity prevention policies clearly conflict with these principles, as their main aim is to reduce unhealthy food intake independent of markets. The right of free trade, however, can be put aside when there is a need for public health protection. Governments may restrict the

free movement of goods or services as part of programmes to counteract childhood obesity. As paediatricians and child health experts, we feel that protecting children is a higher priority than simple economic interests. Governments must find a way to protect their children's health, because of their vulnerability and status as minors (S55).

SUGGESTED ACTION FOR HEALTHCARE SYSTEMS IN DIFFERENT SETTINGS

Advice for parents

Healthcare professionals are in a special position to educate parents and children about the social and health issues connected to digital and traditional media. They should encourage parents to monitor the time their children spend with mass media and the content they view. Creating media literacy should be included in health promotion services delivered to families and children. It is essential that parents and children view media together, so that children can develop their ability to filter information, critically analyse what they view and 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 TVs, or have unlimited access to the Internet.

It is essential that paediatricians encourage families to talk to children about online usage and enhance their supervision of online activities rather than using electronic blockades such as parental control systems, which are less effective and may result in reduced communication within families.

The EAP and the ECOG have agreed on the following recommendations for parents with regard to the proper use of TV and other mass media:

- 1 Do not allow children younger than four years to have unsupervised use of TVs, smartphones, computer and other similar devices. After this age, decide what is best based on their individual development level.
- 2 Limit TV viewing and the use of computers and similar devices to no more than 1.5 hours a day if the child is more than four years of age and make sure they have TV and Internet-free periods each day.
- 3 Do not allow children to have a TV in their bedroom.
- 4 Turn off the TV during meals and study time.
- 5 Be aware of the content of the programmes that children watch and the websites they open, interact and play with.
- 6 Watch children's favourite programmes with them and discuss them. Encourage them to critically appraise mass media messages, ideally by viewing TV or social media together.
- 7 Turn off the TV during commercials, or at least turn the sound off, and set parental controls so that they cannot visit websites that are known to promote junk food.
- 8 Discuss the meaning and purpose of commercials with children when they are aired or displayed on TV or social media.

- 9 Do not provide smartphones to children until they are at least 12 years old and consider postponing this further based on their developmental level.
- 10 Become positive role models by reducing parental TV viewing and Internet use.

Advice for paediatricians, physicians and healthcare providers

Paediatricians should learn how to use the media within their own professional life and focus on the effects it has on the lives of their patients. This should include routine checks on how the family, child or adolescent use TV and new media, to get a complete picture of the child's and family's lifestyle with regard to mass media.

The EAP and the ECOG have agreed on the following recommendations for paediatricians, which will enable them to properly investigate the use of TV and other mass media in the family:

- 1 Routinely ask parents about the family's use of mass media.
- 2 Inform parents about the general risk that mass media use poses to their children's cognitive and physical development.
- 3 Advise parents to reduce their children's TV and social media use.
- 4 Ask adolescents directly about their use of mass media.
- 5 Avoid prejudicial comments about the use of mass media, but educate adolescents on how to use them safely.
- 6 Ensure that children and their parents understand the importance of adhering to guidelines for a healthy diet, adequate physical activity and sleep. This last recommendation is not directly related to mass media.

Advice for teachers

Children spend a large part of each weekday at school and this environment can play a key role in positive messages about childhood health and obesity. In the last few decades, marketing companies have developed strategies that also focus attention on schoolchildren's food consumption. These include various types of direct advertising within schools, such as corporate logos on athletic scoreboards, sponsorship banners in gyms, advertisements in school newspapers and yearbooks, free textbook covers with advertisements and screen-saver advertisements on school computers for branded foods and beverages. Food advertisements can also be delivered by school media, for example through corporate-sponsored educational materials, incentives and contests.

Research has shown that well-designed, well-implemented school programmes can effectively promote physical activity and healthy eating among pupils (S56, S57).

However, schools also have a responsibility to play a critical role in reshaping social and physical environments and

providing information, tools and practical strategies that could help students adopt healthy lifestyles. Schools should seek opportunities to initiate both preventive and educational programmes that enhance the cognitive competencies of children and enlighten their attitudes with regard to all kinds of mass media, starting from when they enter preschool.

As part of their overall education goals, schools provide an ideal setting for teaching young people to adopt and maintain a healthy lifestyle, including developing critical attitudes towards media and advertisements and promoting conscious decisions about healthy diets. School programmes can easily include lessons that encourage children to recognise advertising within mass media and understand the real goals of advertising. Teachers should encourage children to evaluate the reasons why specific foods are placed in movies. Children should also be taught respect for privacy and that providing their friends' names to websites is not appropriate. Lastly, teachers should encourage children to reduce their TV, computer and smartphone use.

The EAP and the ECOG have agreed on the following recommendations to teachers with regard to teaching the proper use of TV and other mass media to children and adolescents:

- 1 Assess the overall use of TV and new media by children and the adolescents attending their classes.
- 2 Invite students to reduce their screen time in favour of human contact.
- 3 Help students to identify the real aims and goals of advertisers, particularly food advertisers.
- 4 Encourage students to interpret subtle advertising messages.
- 5 Educate students on the correct use of the Internet and Internet tools such as advergames.
- 6 Encourage students to respect the privacy of others and not provide the contact details of other students to advertisers.

Advice for societies and stakeholders

At European and national levels, it is essential to educate societies and stakeholders about the impact that mass media can have on the uncontrolled and excessive exposure of children to potentially harmful influences. This unrestricted exposure could be regarded as a form of emotional child abuse and neglect, raising the importance of introducing mandatory regulations that protect children from inappropriate advertising that would adversely affect their health. There is a need for European regulations within the European Health in All Policies strategy that takes into account the variety of mass media influences (S58). The invention and development of new communication technology deserve government attention and offer opportunities for health promotion within a globalised media environment. Health protection policies should also include providing scientific information about the potential health hazards connected with excessive or inappropriate mass media exposure. It would also be worthwhile to

analyse the potential benefits of introducing health protection regulations for the Internet, especially with regard to the content presented in blogs and by social media.

CONCLUSION

Mass media plays an important role in the current epidemic of childhood and adolescent obesity, but it could also be used responsibly to promote children's health. There are many fields in which mass media can influence the development of obesity in children. It is essential to encourage families to discuss how children can develop their abilities to filter information, analyse it critically and discuss the meaning of the information provided. Parents should be advised not to allow children to have mass media devices in their bedrooms, especially TVs, or allow them unlimited access to the Internet. Paediatricians should encourage family discussions about Internet use and enhanced online activities under direct supervision rather than using parental controls or spying applications, which are less effective and may worsen communication within families. Possibilities to initiate preventive and educational programmes that enhance the cognitive competences of children and raising their awareness about using mass media should be sought at society levels. However, this can only be achieved with the cooperation of parents, teachers, healthcare providers and legislators in all fields.

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Appendix S1 Supplementary references.