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Childhood Obesity

At the end of primary school, 35% of children are living with overweight or obesity. Childhood obesity contributes to a range of physical and mental health conditions. This POSTnote outlines current trends in childhood obesity, the impacts on children's health and access to support. It also covers key risk factors for childhood obesity and evidence on the effectiveness of policies to address it.

Overview

- Obesity is complex and is driven by multiple and interacting behavioural, social and environmental factors.
- Data from the National Child Measurement Programme shows that increasing childhood obesity is associated with inequality.
- Children with obesity are at increased risk of mental and physical health problems, some of which can persist into adulthood.
- Children and their parents face barriers in accessing weight management services and there is limited evidence on which interventions work best to reduce obesity.
- Many stakeholders argue that the UK Government's current focus on individual behaviours, improving diet and restricting unhealthy food and drink marketing is insufficient to halve childhood obesity prevalence by 2030.
- Successful reductions in childhood obesity may require a broader set of initiatives in educational settings, town planning and health services.

Background

In 2019, the UK Government called childhood obesity "one of the biggest health challenges this country faces".[1] Its obesity strategy seeks to halve the prevalence of childhood obesity by 2030, with a focus on encouraging individual behaviour change, product reformulation and restricting unhealthy food marketing.[2] Policies to address childhood obesity are also in place in devolved nations.[3–5] Obesity is a condition defined by excess body fat,[6] and in childhood it can have lifelong implications for physical and mental health.[7,8] Public Health England (PHE) estimates that £6.1bn was spent overall on overweight and obesity-related illness in 2014/15.[9] One projection reports that halving childhood obesity by 2030 could save the NHS £37bn.[10]

Trends in childhood obesity

Data on children's weight in England are collected annually at the beginning and end of primary school by the National Child Measurement Programme (NCMP).[11] The Body Mass Index (BMI) measurement is used to determine if a child has a healthy weight (Box 1).[12] The percentage of children aged 10–11 years with a BMI category of overweight or obese was 32% in 2006-07 and 35% in 2019-20.[13,14] The percentage of children aged 4–5 years with a BMI indicating obesity was 10% in 2006-07 and 2019-20, and rose in children aged 10–11 years from 18% in 2006-07 to 21% in 2019-20.[13,14]

Box 1: Body Mass Index (BMI) and children's weight

Calculating BMI in children takes account of their growth and development.[15] In the NCMP, BMI is adjusted for age and sex using population threshold centiles from the British 1990 Growth Reference.[16,17]

- **Overweight**: A BMI at or above the 85th centile; this indicates a child is at risk of obesity.[16]
- **Obesity**: A BMI at or above the 95th centile.[16]
- **Severe obesity**: A BMI at or above the 99th centile.[16,18]

The Parliamentary Office of Science and Technology, Westminster, London SW1A 0AA
02072192840 post@parliament.uk **parliament.uk/post** @POST_UK

The devolved nations record trends in children's weight in different ways. Wales also has an NCMP but collects data only from children aged 4–5 years and last reported 12% of this group as living with obesity in 2017-18.[19] Northern Ireland's 2019-20 Health Survey reported 7% of children aged 2–10 years and 4% children aged 11–15 years were living with obesity.[20] The 2019 Scottish Health Survey reported the highest figures; 14% of 2–6 year olds and 21% of 12–15 year olds were recorded as living with obesity.[21]

Health inequalities and childhood obesity

A health inequality is a preventable, unfair and systemic difference of health status, access to, or experience of care between groups.[22,23] There are growing inequalities in childhood obesity that are associated with socio-economic deprivation, sex and ethnicity; some inequalities may intersect.

- **Socio-economic deprivation.** Data show that children from the most deprived areas are more than twice as likely to be living with obesity as those from the least deprived areas.[24]
- **Sex.** Boys are more likely to be living with obesity than girls in all age groups. A high BMI in girls appears more closely related to low household income than in boys.[25]
- **Ethnicity.** Children from some Black and minority ethnic communities are more likely than White British children to have a high BMI and this inequality is growing.[14]

Health impacts of obesity

Children living with obesity are at increased risk of psychological and physical health problems that can persist into adulthood. This may result in longer periods of poor health and a shorter life expectancy compared with those of a healthy weight.[26]

Physical health

Childhood obesity is associated with an increased risk of developing a range of conditions that are not transmitted, called noncommunicable diseases (NCD). Children living with overweight and obesity are developing lifestyle-related NCDs previously usually only seen in adults, notably liver conditions and type 2 diabetes (Box 2).[27] Other problems include high blood pressure and musculoskeletal conditions.

Non-alcoholic fatty liver disease (NAFLD) is caused by a build-up of fat in the liver and is usually seen in people living with overweight or obesity.[28] The risk of developing fatty liver increases with BMI.[29] Although most children go undiagnosed, prevalence of NAFLD has increased with rates of childhood obesity.[30] If diagnosed early, children with NAFLD can avoid long-term liver problems if they adopt healthy eating and increase their physical activity.

Childhood obesity rarely directly causes adult morbidity but does significantly increase the risk of developing NCDs as an adult.[7,31–34] Children with obesity are three times more likely to develop high blood pressure than children with a healthy weight.[35,36] Having a high BMI at age 11 has been linked to knee osteoarthritis in adulthood.[37,38]

Box 2: Type 2 diabetes in children

Overweight and obesity are risk factors for type 2 diabetes.[39] Before 2000, the condition was rare in children,[40] but prevalence is increasing.[41] The latest data for 2018/19 found 790 children in England and Wales were receiving specialist treatment for type 2 diabetes, 85% of whom had a BMI indicating obesity.[42] Of these children, 20% had signs of kidney disease and 45% had high blood pressure, which is associated with an increased risk of developing cardiovascular disease.[42] There is a higher risk of type 2 diabetes for girls, children from Black and minority ethnic communities and those from the most deprived areas.[42]

Mental health and well-being

Research linking weight and mental health suggests a complex and reciprocal relationship,[7] but remains less developed for children than adults with obesity.[43] Evidence indicates an association between depression and obesity and, compared with children of a healthy weight, children with obesity are 32% more likely to have depression.[44] For girls, the risk of developing social anxiety increases with BMI.[45,46] The association between obesity and children's psychological well-being may be shaped by:

- **Bullying.** Children living with overweight are more likely to experience social ostracism and weight-based teasing than children of a healthy weight. This is consistently associated with low body satisfaction, low self-esteem and depressive symptoms.[47–49]
- **Stigma.** Insensitive depictions of weight contribute to negative body image, which is linked to low self-esteem, increased risk of unhealthy eating and non-participation in physical activity (Box 3).[47,50,51] Evidence suggests that framing obesity as a choice is stigmatising because it ignores non-behavioural contributors to weight gain.[52,53]

Box 3: Young people's experiences of stigma

Researchers have explored children's daily experience of living with obesity and how it affects their well-being:

- "You are always thinking about it, especially in public... if I had the choice, I wouldn't be this size." Rachel, age 17.[54]
- "Doctors that I've had haven't always been particularly nice about it." Holly, age 18.[54]

Perceptions of health professionals' obesity stigma may prevent parents and children accessing or engaging with treatments.[53,55,56,57]

Risk factors for childhood obesity

Obesity is complex and driven by multiple behavioural, social, and environmental factors.[58,59] The biggest risk factors include unhealthy diet, lack of physical activity, family health and behaviour, access to food outlets and spaces for exercise.

Diet

Environmental exposure to unhealthy food and excess calorie consumption increase a child's risk of being overweight and obese.[60,61] Daily excess consumption of calories occurs in some children across all age groups, with adolescent boys living with overweight and obesity consuming an estimated 500 excess calories per day.[62] Since 2008, a large national diet and nutrition survey reports children's sugar intakes have decreased by up to 3.5 percentage points but remain above the current daily recommended levels.[63,64] The same survey reports

children's fat and saturated fat intakes have changed little and have consistently been above recommended levels.[64]

Food and drink marketing seen by children

A significant body of research has found screen advertising largely promotes unhealthy food and drinks, and even short-term exposure produces minor increases in energy intakes by children across a range of ages.[65–68] Placing food in stores at eye-level and branding packaging with characters influences children's food preferences.[69–73] Research indicates advertising restrictions could contribute to reducing children's consumption of unhealthy food and drink.[74–79]

School food

School food standards have been in place in England since 2006, but do not apply in early years settings (CBP 04195).[80,81] In settings for under-5s (nurseries), studies have found low adherence to voluntary government food and physical activity standards.[82,83] Food prepared in-school can be more nutritionally balanced than food brought from home; one study found 1% of packed lunches met school food standards between 2006 and 2016.[84] A study examining the impact of universal infant free school meals found that they are linked to a reduction in children's BMI throughout the first year of school.[85]

Physical activity

Children with a high BMI are more likely to have low levels of physical activity.[86,87] The National Institute for Health and Care Excellence (NICE) recommends children move more through play, travel, sport and leisure to prevent and treat obesity.[88] The UK Government advises that children aged 5–18 years should engage in physical activity that gets them slightly hot, sweaty and out of breath for an average of 60 minutes per day, with activity accumulated across the day.[89,90] Sport England has found that fewer than half of children achieve this and levels of physical activity decline with age.[91–93] Children's screen use has increased during the past decade and contributes to sedentary behaviour.[94] During COVID-19-related closures, children's activity is estimated to have decreased by 2.3% overall.[95] This suggests school, leisure and sports facilities are important in supporting children to be physically active.[96]

Family health and behaviour

Research indicates that the odds of obesity increase by 264% for children of mothers living with obesity before conception.[97] Severe stress before and during pregnancy is associated with an increased risk of overweight children.[98,99] In adults, overeating is a well-recognised behaviour for coping with stress. Young children imitate their parent's choice of diet, so may develop unhealthy food preferences that remain in adulthood.[100,101] Parenting styles and approaches to managing children's diet can influence a child's BMI.[102] Children breastfed for 6 weeks or more after birth have a lower later risk of obesity than those who are not. Rates of breastfeeding in the UK remain the lowest in Europe.[103–105] However, some argue overemphasising the role of women's bodies and family behaviour in obesity transmission causes mother blaming.[106] Food and drink marketing employing prizes, competitions and product placement can encourage children to request their parents buy more energy-dense products.[107,108] While genes are rarely a direct cause of child weight gain,[61,109] some obesity risk is epigenetic (caused by changes in gene activity promoted by social and environmental factors).[110–113]

Wider environment

The wider environment is one of the main factors driving childhood obesity. Environmental inequalities reflect childhood obesity trends; socio-economically deprived and ethnically diverse areas have fewer green spaces for exercise perceived to be safe or accessible and have more takeaway outlets.[114–120] Since 2010, there has been no ministerial responsibility for children's play or a national play strategy in England.[121] Between 2008–2012, 20% of children from a range of age and socio-economic groups ate food from takeaway outlets at home once or more per week.[122] Food from takeaway outlets often provides children with high energy intakes from unhealthy fast-food such as burgers, chips and desserts.[123] Research has identified an association between unhealthy retail environments around schools and the prevalence of overweight in children.[124]

Access to health services

There are four weight management service tiers. These cover universal health campaigns (Tier 1: prevention), Local Authority (LA) weight management services (Tier 2: treatment), and clinics run by specialists that seek to support children with complex and severe obesity (Tiers 3 & 4: treatment). Parents receive an NCMP letter outlining if their child is living with overweight or obesity. However, the framing of these letters has been found to contribute to an avoidance of weight management services.[125–128]

The demand for weight management services is assessed by individual health service commissioners based on expert advice, national guidelines and local data.[129] There is no central mechanism to assess whether the provision of services for children is adequate to meet need.[129,130] In 2018-19, LAs in England spent £62m on childhood obesity services, a real term decrease of 11% since 2016-17.[131,132] The UK Government has announced a £100m funding commitment to weight management services for parents, adults and children between 2021–2022. This includes £70 million for NHS and LA weight management services, and £30 million in initiatives to motivate people to maintain a healthy weight, including a free NHS 12-week weight loss plan app and upskilling for healthcare professionals.[133]

Access to specialist services

Obesity specialists argue the tier system is blocking patients' access to treatments, including surgery.[53,55] Researchers have estimated that 23% out of 283,000 children eligible for weight management services are likely to attend.[136] Barriers to accessing services are uncertain but may include a lack of available information and perceptions of weight stigma.[137] A child must attend weight management services (Tier 3) for 6 months before being considered for surgery (Tier 4), which NICE recommends only in exceptional circumstances.[134] The latest data from 2011–2013 data indicates a total of 23 operations were performed on children during these years.[135]

Effectiveness of services

There is consensus that the most effective interventions are coordinated between different service providers, robustly monitored and work towards resolving inequality.[134,138–142] However, local health service commissioners may use different measures to evaluate the effectiveness of weight management services. This makes it difficult to assess which approaches work best.[143–145] LAs that report long-term reductions in child BMI have implemented a diverse set of initiatives spanning early years settings, schools, town planning and public health services.[146] Compared with non-surgical interventions, long-term studies of adolescent bariatric surgery show cost-effectiveness, substantial and sustained BMI reduction, and improvements in NCD outcomes but not mental health.[147–149]

Policies to address childhood obesity

Since 1992, policies to tackle obesity in England, including three chapters of the childhood obesity strategy (2016–2019),[150–152] have focused on individual behaviour change, improving diet, and regulating the marketing of unhealthy food and drink products.[2,52,153] There is consensus among a range of stakeholders that these interventions alone are insufficient to halve childhood prevalence by 2030.[7,154,155] Many are calling for a more comprehensive, whole systems approach to obesity strategy in education, town planning and health services.[156,157] Stakeholders, including academics and clinicians, argue policy could be more effective with mandatory environmental regulations, improved access to treatment and more positive communication about children's weight.

Encouraging healthy diets

Industry targets and regulation

The 2018 Soft Drink Industry Levy taxes some drinks containing 5 g of sugar or more per 100 ml. Sugar in products subject to the levy has declined by 44% on average.[6,158–162] In 2017, Public Health England (PHE) set a voluntary target for industry to reduce sugar content by 20% in foods that contribute the most sugar to children's diet (including cereals, yogurts and confectionery).[163] This has led to an average sugar content reduction in selected products of 3%.[164] In 2018, the UK Government challenged industry to achieve a 20% reduction in the calorie content of products that are significant contributors to children's energy intakes by 2024, including ready meals and pizzas.[62] Data on progress towards this will be published in late 2021. PHE has reviewed the evidence and opportunities to improve commercial baby food and drinks.[165] The food industry is concerned about additional mandatory regulation, as sugar reduction in food is technically complex and consumer awareness of reformulated products (POSTnote 638) may be hindered by advertising restrictions.[159,166–168]

Advertising and food labelling restrictions

By April 2022, planned legislation will ban in-store promotion of unhealthy food by end-of-aisle and checkout placement and multi-buy promotions.[171] The UK Government intends to introduce a 9pm watershed on advertising foods high in fat and sugar to children, with policy expected by late 2022.[62] The Departments for Health and Social Care and Digital, Culture, Media & Sport have consulted on a total online ban for products high in fat, sugar and salt and options for front-of-pack labelling to give consumers more nutritional information.[172,173]

Health education

Interventions to reduce childhood obesity

In 2013 NICE recommended family-based weight management programmes.[134] In a recent review, the evidence about the effectiveness of diet or physical activity programmes to reduce obesity risk is mixed, and differs dependent on the age of the children and the focus of the intervention. Physical activity interventions alone are effective for 6–18 year olds, but not for younger children. For 6–18 year olds, dietary changes alone are ineffective but may work if combined with a physical activity intervention.[174] A study sampling LA obesity programmes found the majority are focused on changing individual behaviours rather than the environments in which people live.[175]

School curriculum, meals and active learning

From September 2020, health education became statutory in all English state-funded schools. The curriculum includes content on the importance of exercise, good nutrition and the risks associated with an inactive lifestyle, including obesity. The School Sport and Activity Action Plan aims to improve the delivery of PE, with schemes to improve active learning (teaching that incorporates movement) and access to extra-curricular sports facilities.[176] In addition, a voluntary Healthy Schools Rating Scheme in England surveys school food and children's physical activity levels.[177] While this concept has stakeholder support, its impact is unclear and has attracted criticism for placing additional burden on schools.[178] Extending mandatory food standards to nurseries and monitoring all settings may encourage healthier behaviours. [81,179,180]

Creating healthier places to live

Regulation that ensures equal access to healthy environments could improve children's diet and physical activity.[181,182] LAs have powers under the National Planning Policy Framework and accompanying Planning Practice Guidance to limit the proliferation of hot food takeaways.[183] The Government's Childhood Obesity Trailblazer Programme is testing local powers to address health inequalities among selected LAs until 2022.[184–186] The Pennine and Lancashire LA Consortium Trailblazer reports capacity issues in regulating hot food takeaway location and menu content.[187] Despite evidence of links between the built environment and obesity, the 2020 Planning White Paper does not refer to the role of planning in tackling it.[188] The Town and Country Planning Association, Place Alliance and others argue that incentives to build healthy environments are weak as standards for minimum space, greenspace access and walkability are optional.[189–191,192]

Supporting parents and health professionals

It is estimated that a third of parents are unable to recognise that their child is overweight.[193] Some stakeholders suggest that the NCMP could be used more effectively as a gateway to interventions in England. Professionals have received updated guidance from PHE on holding weight-related conversations.[194] There are plans to make NCMP data available online, providing an opportunity for more positive feedback and signposting to services.[133,195] Obesity specialists argue access to treatments could be simplified using the Future of Health and Care White Paper.[53,55,196] Surveying and evaluating weight management services might allow the Government to address gaps in provision and learn which interventions work best.[7,141,143,145]

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