Clinical Practice GUIDELINE for the Management of Obesity in Adults in Ireland

Epidemiology of Adult Obesity in Ireland

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KEY MESSAGES FOR POLICY MAKERS AND HEALTHCARE PROFESSIONALS IN IRELAND

- **Obesity is a complex chronic disease, characterised by dysfunctional or excess body fat (adiposity), that impairs health.**
- **Excess or dysfunctional adiposity increases the risk of health complications, such as heart disease, cancer, stroke, type 2 diabetes, non-alcoholic fatty liver disease, as well as mental health, mood, anxiety and eating disorders.** It can also impair health-related quality of life and reduce life expectancy.
- **From an epidemiological perspective, obesity is classified as a body mass index (BMI; weight/height^2) exceeding 30 kg/m^2, and further sub-classified into class 1 (BMI 30 kg/m^2 – 34.9 kg/m^2), class 2 (BMI 35 kg/m^2 – 39.9 kg/m^2) and class 3 (BMI ≥ 40 kg/m^2) obesity.**
- **In Ireland, the prevalence of BMI-classified obesity in adults has doubled in the last three decades, affecting 23% of Irish adults in 2019[1].** The percentage of the Irish population with class 2 obesity increased significantly between 1990 and 2011 from 1.4% to 3.6%[2]. Overweight (classified as BMI 25 kg/m^2 – 29.9 kg/m^2) affects an additional 37% of adults in Ireland[2]. Over the same 30-year time period, measures of abdominal adiposity increased concurrently, and are associated with significant increases in health risk.
- **Health professionals should not rely solely on BMI to predict an individual's health risk but use it in conjunction with other screening and assessment tools.**
- **Weight bias, stigma and discrimination are pervasive in society and the healthcare system and result in the unjust treatment of individuals living with obesity.**

KEY MESSAGES FOR POLICY MAKERS AND HEALTHCARE PROFESSIONALS IN IRELAND - Continued

- **The causes of and contributors to obesity are dynamic and complex and extend well beyond the individual.** Established contributors include socio-economic status, health inequalities, sex, ethnicity, access to healthcare, genetics, food and built environments.

- **There is a strong socio-economic gradient to obesity prevalence, and large inequalities in health status exist according to socio-economic status in Ireland.** People living in deprived areas are more likely to have a BMI > 25 kg/m^2 (65% vs. 55%) and report a chronic health condition (42% vs. 35%) compared to those in more affluent areas. Among those aged < 35 years, 50% of those living in deprived areas have BMI-classified overweight or obesity, compared to 37% of those living in more affluent areas[1].

- **Obesity affects individuals, families and society with a significant economic burden, mainly relating to increases in healthcare costs and lost productivity.** In 2017, the lifetime costs of obesity on the island of Ireland were estimated at €7.2 billion, with €4.6 billion relating to the Republic of Ireland[3].

- **Successful management (i.e., prevention and treatment) of obesity will require collective effort at the policy, health system, community and individual levels.**

- **There is a need for continued and focused investment in research funding to support the scientific understanding of obesity.** This includes non-experimental research on the wider complex obesity system, which incorporates biopsychosocial and environmental drivers, and experimental research to develop and test interventions to prevent, manage and treat obesity. Research on how best to implement evidence-based practice and policy is a priority.

RECOMMENDATIONS

1. Healthcare professionals can recognise and treat obesity as a complex chronic disease, characterised by abnormal or excessive body fat (adiposity), that impairs health, with increased risk of premature morbidity and mortality (Level 2b, Grade B)[4-9].
2. The development of evidence-informed strategies at the health system and policy levels can be directed at managing obesity in adults (Level 2b, Grade B)[5-9].
3. Continued longitudinal national and regional surveillance of obesity that includes self-reported and measured data (i.e., heights, weights, waist circumference) may be collected on a regular basis (Level 2b, Grade B)[5-9].

Introduction

The prevalence of obesity has increased significantly in Ireland and in many other countries over the last 30 years and is considered a global public health priority, affecting over 650 million individuals worldwide[1,4,6]. Obesity is a complex chronic disease, characterised by dysfunctional or excess body fat (adiposity), that impairs health. Health-related quality of life is significantly lower for individuals living with obesity when compared to the general population due to impaired metabolic, functional and mental health, increased depression and anxiety, problems with pain and discomfort and reduced mobility[10]. People living with obesity experience pervasive weight bias, stigma and discrimination that further impacts their wellbeing and leads to health and social inequalities[11].

It is a complex disease in both its aetiology and pathophysiology[12]. In epidemiological research, obesity is often classified using body mass index (BMI), calculated as weight in kilograms divided by height in metres squared (kg/m^2). At a population level, BMI-classified obesity is considered a BMI greater than or equal to 30 kg/m^2 and further divided into subgroups: class 1: BMI 30 kg/m^2 – 34.9 kg/m^2, class 2: BMI 35 kg/m^2 – 39.9 kg/m^2 and class 3: BMI ≥ 40 kg/m^2.

Due to its ease of measurement, BMI is often used to estimate the possible health risks associated with excess body weight. At a population level, increasing BMI is associated with increased health risks[7,9,13,14]. Other anthropometric measures, such as waist circumference, waist-to-hip ratio and skinfold measures, are used as proxies of total or abdominal adiposity and to estimate how BMI-classified obesity and abdominal adiposity impact. These measures also have limitations related to validity and reliability and, as with BMI, do not directly measure total or regional body fat[15]. Of these anthropometric measures, waist circumference is a measure frequently used to assess excess body weight around the abdominal area. Increasing waist circumference is associated with increased health risks for type 2 diabetes, hypertension and coronary heart disease. Threshold cut-off values used to assess health risk in Caucasian populations has been determined to be > 102 cm (40 inches) in men and > 88 cm (35 inches) in women [6,17]

(see Chapter 6 Clinical Assessment of People Living with Obesity for further information). Other assessment criteria have been developed to assess obesity-related health risks, including the Edmonton Obesity Staging System (EOSS), a five-point ordinal (0–5) classification system that examines comorbidity and functional status and its relationship with mortality. The EOSS predicts mortality independent of BMI and may be more applicable for use independent of or in addition to BMI and waist circumference in a clinical setting when screening for and assessing an individual's health risk for obesity[18] (see Chapter 6 Clinical Assessment of People Living with Obesity for further information).

Data are lacking nationally and internationally on the prevalence of obesity defined by the impact of adiposity on health, and more research is needed in this area. However, cross-sectional data from the Irish Survey of Lifestyle Attitudes and Nutrition (SLAN) has found associations between self-reported BMI and type 2 diabetes, hypertension, back pain, cholesterol and osteoarthritis. It found an increased prevalence of two or more chronic health conditions in the BMI > 30 kg/m^2 category (11.2% and 17.4% for men and women, respectively), compared to the BMI 25 kg/m^2 – 30 kg/m^2 category (8.2% and 13% for men and women, respectively) and the BMI < 25 kg/m^2 category (6.9% and 9.1% for men and women, respectively)[19]. Also a 2017 study looking at bariatric surgery eligibility in the Irish Longitudinal Study on Ageing (TILDA) cohort found that 7.9% (n = 92,573) of adults > 50 years had a BMI > 40 kg/m^2 with type 2 diabetes, hypertension, a previous myocardial infarction or obstructive sleep apnoea; while 0.97% (n = 11,231) had a BMI > 35kg/m^2 with a previous myocardial infarction, elevated urine albumin-creatinine ratio, retinopathy, neuropathy or peripheral vascular disease[20].

In Ireland, the prevalence of obesity in adults (> 18 years) increased significantly over the last three decades. Obesity, defined using BMI, increased from 10.9% in 1990 to 23.6% in 2019[2]. Some epidemiological studies in Ireland use self-reported height and weight to measure levels of overweight and obesity as opposed to using measured data. The most recent nationally representative data on measured BMI was collected over a decade ago in the National Adult Nutrition Survey (NANS)[21]. Self-reported nationally representative data has been more recently collected in the Healthy Ireland Surveys[1,22,23]. Data from three waves of the SLAN surveys in 1998, 2002 and 2007, which included both self-reported and measured height and weight, showed that self-reporting underestimated BMI and that increased across time[24]. Interestingly, data from the Mitchelstown Cohort Rescreen study showed a linear trend relationship between increasing BMI and correct self-selection of BMI category; participants in the highest BMI quartile had an approximate eight-fold increased odds of correctly selecting their BMI category when compared to participants within the lower quartiles[25]. Although self-reported data typically underestimates actual measures of overweight and obesity, all data sets (both actual and self-reported) show a trend or increased prevalence of overweight and obesity levels in Ireland since the 1990s (Figure 1 and 2). Since 1990, the proportion of people affected by severe obesity has also increased. The percentage of the total Irish population with class 2 obesity increased significantly between 1990 and 2011 from 1.4% to 3.6%[2]. This increase in prevalence is a concern as class 2 and 3 obesity is associated with a higher risk of ill health and premature mortality than class 1 obesity[7,26].

Figure 1: **BMI by Year from Healthy Ireland Surveys 2015, 2017, 2019**

Reproduced from Healthy Ireland Report 2019[1]

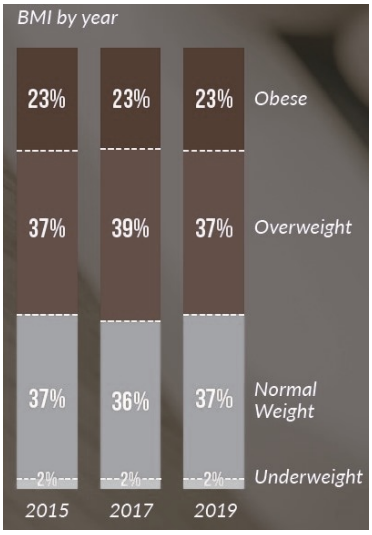
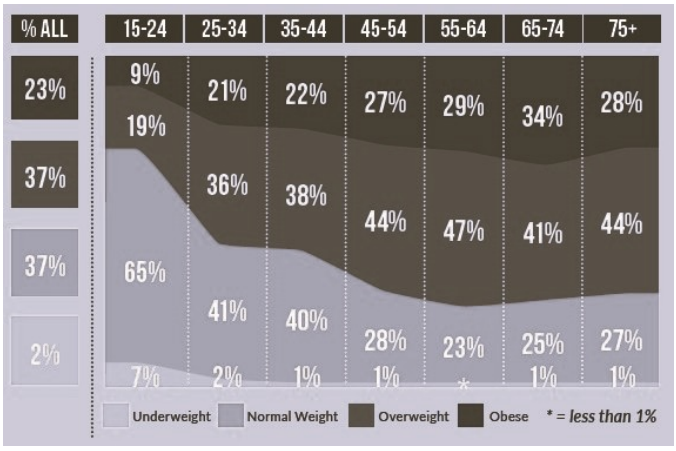


Figure 2: **BMI by Age Category Reproduced from Healthy Ireland Report 2019**[1]



Increasing abdominal adiposity is also associated with increased health risks. Using measured waist circumference data from the North/South Ireland Food Consumption Survey (NSIFCS)[27] in 2001 and NANS in 2011[21], significant increases abdominal adiposity were observed whereby mean adult waist circumferences increased from 81.2 cm to 86.3 cm over the 10-year period[2].

The TILDA study looked at overweight and obesity levels in adults > 50 years in Ireland and found that 46% had a BMI > 25 kg/m^2, while a further 36% had a BMI > 30 kg/m^2. Fifty-two per-cent of those over 50 years in Ireland had a waist circumference which is considered at "substantially increased" risk of metabolic disease

(> 88 cm for women, > 102 cm for men), while a further 25% were considered to be at "increased" risk (waist circumference > 80 cm for women, > 94 cm for men)[28]. The Intellectual Disability Supplement to the TILDA study, which assessed the health and wellbeing of older Irish adults with intellectual disability aged ≥ 40 years, found that 69% of participants had a BMI > 25 kg/m^2, with greater frequency in women (72%). A higher percentage of participants aged < 50 years (72.5%) had had a BMI > 25 kg/m^2 than those aged 50–64 (70%) and 65+ (61.4%). Level of intellectual disability and residence type were significantly associated with weight status ($P < 0.001$), with overweight/obesity more prevalent in mild (85.7%) than moderate (72%) or severe/profound intellectual disability (51.4%). Of those who lived independently/with family, 78.4% had a BMI > 25 kg/m^2, compared to 74% living in a community group home ($P < 0.001$)[29].

Globally, obesity is one of the largest contributors to ill health, with annual costs estimated at $2 trillion US dollars, equivalent to 2.8% of the world's gross domestic product[30]. In 2009, healthcare costs for obesity were estimated to be €437 million for the Republic of Ireland (ROI) and €127.41 for Northern Ireland (NI), while productivity loss was estimated at €865 million for ROI and €362 million for NI[31]. In 2017, lifetime costs were estimated at €4.6 billion for the ROI[3] .

Childhood obesity

While childhood obesity is outside the scope of these adult clinical practice guidelines, we were aware that from an epidemiological perspective it would be helpful to include some of the available data in Ireland on childhood obesity.

In Ireland, the prevalence of excess body weight in children has also increased over the last three decades. Using the World Health Organisation (WHO) criteria for children[32] the prevalence of BMI-classified overweight and obesity increased significantly in children aged 5 to 12 years between 1990 (12.2%) and 2011 (24.6%), but showed a decrease in 2015 (16.4%)[33]. Data recorded in first class primary school-aged children in 2015–2019 (round 4 to round 5 in the Childhood Obesity Surveillance Initiative (COSI) study) suggests that the prevalence of overweight and obesity may be stabilising[34]. In contrast to adult data, the level of abdominal obesity in children (as measured by waist circumference and waist-to-height ratio) was significantly lower in 2019 compared to 2005[34].

Differences in child adiposity levels were also identified between sex, age and social class groups. In 2018–2019, the prevalence of overweight and obesity among children aged 5 to 12 was significantly higher in girls (19%) compared to boys (14%)[33]. Those from the highest social class had a significantly lower prevalence of overweight and obesity (13%) compared to those from the lowest social class group (25%)[33]. Data from COSI found that overweight and obesity is significantly higher in disadvantaged schools and that this disparity is increasing[34]. Data from 2002 to 2014 also showed an increased prevalence of overweight/obesity in children with medical cards compared to those without[35].

Health complications

Increased adiposity increases the risk of developing health complications in some individuals[36]. It can increase the risk of cardiovascular disease[7] and cancer[37-40], two of the primary causes of mortality in Ireland in 2020[41]. Globally, it is estimated that 20% of all cancers can be attributed to increased adiposity. BMI-classified obesity increases the risk of colon, kidney, oesophageal and pancreatic cancers in both sexes and endometrial and post-menopausal breast cancers in women[40]. It also increases the risk of developing type 2 diabetes[42], gallbladder disease[43] and gout[44], and is associated with functional limitations and psychological complications that impair quality of life. BMI-classified obesity is associated with a nearly three-fold increased risk of osteoarthritis and changes in gait that negatively impact mobility. Pain associated with osteoarthritis leads to the avoidance of physical activity, thus further contributing to functional limitations and increased risk for depression and anxiety and reduced quality of life[45]. It is also associated with a higher risk of mental health complications; for example, individuals living with obesity are twice as likely to be diagnosed with a mood disorder compared to individuals without obesity[46].

Weight-related stigma is highly prevalent and occurs at home, places of employment, healthcare facilities, educational institutions and in the media. Negative societal attitudes, stigma and prejudice towards individuals living with obesity contribute to the large mental health burden observed. This bias negatively impacts the health of individuals through increased anxiety and depression, employment inequities, avoidance of healthcare professionals (HCPs) and inequitable treatment received in the healthcare system. Bias likely also contributes to the increased risk of mortality observed in individuals with obesity[8].

Excess body weight, classified using BMI, increases the risk of mortality, with a recent study showing a U-shape distribution between BMI and all-cause mortality[47]. The relationship between BMI and mortality has been clearly demonstrated in several large-scale studies, independent of sex and ethnicity. A meta-analysis of 239 studies of more than 10 million individuals across four continents demonstrated that all classes of overweight and obesity were associated with an increased risk of all-cause mortality in every region in the world, with the exception of South Asia[9]. The relationship between BMI and mortality risk in Asian populations has been demonstrated in other studies[48]. In another meta-analysis of 57 prospective cohort studies, including close to one million individuals living in Western Europe and North America, mortality risk in both men and women was lowest in the BMI range between 22.5 kg/m^2 – 25 kg/m^2 [7] and each 5 kg/m^2 increase in BMI above a BMI of 25 kg/m^2 was associated with a 30% increased risk of all-cause mortality. A dose-response relationship has been shown to exist between increasing BMI classes and an increased risk of mortality[49], however the threshold at which excess adiposity impairs health in individuals varies[50].

Causes and contributors to obesity risk

The prevalence of BMI-classified obesity differs across demographic factors, such as age, sex and ethnicity. Those living in disadvantaged circumstances, certain ethnic/cultural minority groups (e.g., the Traveller community, asylum seekers) and people with a disability are at a higher risk of developing obesity than others in the population[51] .

Ethnicity appears to have an influence on the risk of developing obesity and obesity-related conditions. There is also evidence that overall health, wellbeing and health service utilisation vary by ethnicity[52]. A systematic review of 42 studies identified that some ethnic minority groups (e.g., African Americans, Latinos) have a higher prevalence of type 2 diabetes, sub-optimal diabetes management and associated complications compared to majority ethnic groups[53]. This is important, as the Central Statistics Office (CSO) reported that the fastest growing ethnic group from 2011–2016 was "Other including mixed background", and while the population of Ireland grew at 0.8% per annum, those with Irish ethnicity increased by just 0.2% during that time period[54].

Traveller community

According to the 2016 Irish census, Irish Travellers made up 0.7% of the Irish population (30,987 individuals)[54]. To date, however, no nationally representative data on overweight/obesity levels has been collected for the Traveller community. The All Ireland Traveller Health[55] refers to a pilot study by Slattery *et al.*[56], where BMI was measured in a small cohort of adults (n = 187) from the Traveller community (n = 60 male, n = 127 female, mean age = 38 years). Although this sample is not directly comparable to nationally representative data, a higher prevalence of BMI-classified overweight and obesity levels was identified compared to nationally representative data of adults aged 35–44 years old in 2019 (35% and 49%, versus 22% and 38%, respectively)[1,56] .

Asylum seekers

International and national research suggests that immigration status is associated with the prevalence of obesity. A 2006 study of asylum seekers living in Direct Provision and in rented accommodation in the northwest of Ireland found that 45% of the participants reported unintentional weight gain since arriving in Ireland. Issues included limited food choices, lack of access to ethnic foods, food poverty and social exclusion[57]. Of note, individuals in emergency homeless accommodation face similar problems linked to lack of access to cooking and refrigeration facilities, limited food options, confinement in a small space and poorer mental health[58].

Social determinants of obesity

Obesity is a significant public health problem[59] which needs a cross-sectoral approach and a concerted effort by policy makers to develop robust policies to stall, reverse and manage this trend across all strata of society. The current situation has been described as "the result of a normal response, by normal people, to an abnormal situation"[60]. To address obesity, it is essential to understand it in the context of a complex adaptive system, which requires upstream interventions at the policy level. These interventions include development and implementation of effective government policy to create health-promoting environments for all in society[61]. In Ireland, implementation of the Healthy Weight for Ireland Obesity Policy and Action Plan 2016–2025 is overseen by a cross-sectoral and cross-departmental group (Obesity Policy Implementation Oversight Group) chaired by the Department of Health. The Obesity Policy and Action Plan 2016–2025 outlines multi-sectoral targets and actions to reduce obesity prevalence, and is currently under evaluation[51].

Lakervald *et al*. [62] reviewed and summarised the evidence base of currently recognised upstream social determinants of obesity and identified socio-economic status and inequality to be the most commonly experienced. Socio-cultural factors, such as education and income, and environmental factors, such as whether individuals live in urban versus rural areas, are associated with differences in obesity risk[63]. On a national level, adults living in deprived areas in Ireland are more likely to have BMI-classified overweight or obesity compared to those living in an affluent area (65% versus 55%, respectively)[1]. This was also observed in children in Ireland, where disadvantaged primary schools had significantly higher levels of overweight and obesity[34]. Internationally, research is conflicting on urban-rural divides and the prevalence of obesity. One study published in 2019 examined over 2,009 population-based studies across the world and observed a higher increase in BMI in rural areas compared to urban areas[64]. In contrast, the 2022 WHO European Regional Obesity report cites two studies from 2007 and 2010 that report an association between more "obesogenic" or health-disrupting environments and increased urbanisation[65].

A significant amount of research has focused on individual-level health behaviours, such as food intake and levels of physical activity, and their association with obesity, however the relationship is not well defined[66]. Other contributors within our modern environment increase the risk of developing obesity, such as medication use, chronic stress, insufficient sleep, decreased smoking rates and modern energy-saving conveniences, such as cars, remote controls, washing machines, etc., some of which have been measured and reported in SLAN and Healthy Ireland surveys[1,22,23,67]. Many of these factors are associated with small contributions to energy regulation and demonstrate secular trends that mirror the rise in obesity[68,69]. In the case of medications, several pharmaceuticals used for treating health complications commonly associated with obesity, such as depression, hypertension and type 2 diabetes, are known to promote weight gain[70] (see Chapter 6 Clinical Assessment of People Living with Obesity for further information). Thus, patients can find themselves in a paradoxical situation in that treatment for their obesity-related conditions also exacerbates their obesity.

Assessment of obesity risk is challenging

HCPs should not rely solely on BMI to predict an individual's health risk. Although higher BMI is associated with an increase in morbidity and mortality risk at a population level, it may not be associated with impaired health at the individual level[71]. Thus, while BMI may be used for initial screening and epidemiological monitoring purposes, the assessment and diagnosis of obesity and its impact on health requires additional assessment and diagnosis (see Chapter 6 Clinical Assessment of People Living with Obesity for further information). HCPs should be aware of the wider health risks associated with obesity (not just metabolic complications) and any mediating factors, such as levels of physical activity[72,73].

Conclusion

In Ireland, the prevalence of BMI-classified obesity increased over two-fold over the last three decades and now affects one in four adults. However, it appears to have stabilised in the last 10 years. Continued surveillance of BMI-classified obesity, including self-reported and measured data, is needed to monitor population trends. Data on the prevalence of obesity, defined as a complex chronic disease, characterised by dysfunctional or excess body fat (adiposity), that impairs health, is lacking and further research in this area is necessary. Obesity and related complications negatively impact health and quality of life and reduce life expectancy. In Ireland, the increasing humanistic, health system and societal burden of obesity is significant and does not discriminate, affecting individuals across age, sex, ethnicity and socio-economic class. The complex aetiology of obesity has contributed to pervasive bias and stigma in the healthcare system and within society as a whole and has hindered progress in managing obesity as a chronic disease. A cross-sectorial approach from policy makers and the research community is needed to develop and test interventions and polices to prevent, manage and treat obesity in Ireland.

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