

# Obesity in Bahrain

A major public health challenge



# Stepping up action on obesity

Obesity is a public health challenge in Bahrain that deserves earnest recognition. Action to highlight the burden of the disease and efforts to reverse its trajectory have been initiated. However, the need to focus and support those affected is urgent. Greater collective efforts are required if the individual, community and economic costs of this epidemic are to be effectively tackled.

Now, more than ever, it is essential that:

## Obesity is prioritised

- Obesity must be recognised as a complex, multifactorial chronic condition requiring long-term management solutions.
- The clinical treatment pathway for the management of obesity needs to be strengthened through proactive application of the clinical management guidelines established to support healthcare decision-making.

## Individuals and healthcare professionals are empowered and supported

- Individuals need to be and feel empowered with the information to make healthy life choices and to take control of their health from an early age.
- Healthcare professionals need the tools and strategies to support people with obesity in an environment free from stigma.

## Government, organisations and communities collaborate to combat obesity

- A broad multi-stakeholder approach must be adopted and promoted to develop and implement practical solutions around the obesity challenge.

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### The purpose of the briefing book

This briefing book seeks to inform policymakers, healthcare professionals and the general public of the serious and widespread health challenge of obesity in Bahrain by highlighting its impact on society and individuals.

The book also aims to emphasise opportunities for the prevention and management of obesity as a disease as well as showcase initiatives that have been introduced in Bahrain to address this issue.

# Foreword

Over the past 50 years, the prevalence of obesity has more than tripled globally, and millions of adults are now living with the condition<sup>1</sup>. Obesity is associated with significant harms for individuals and society, and the after-effects of delayed action on obesity prevention and management will be a major burden on healthcare and society in the future<sup>1</sup>.

The Gulf Cooperation Council (GCC) countries have seen a rapid escalation in the prevalence of obesity and obesity-related health conditions<sup>2</sup>. Obesity is a significant driver of chronic non-communicable diseases (NCDs). These include cardiovascular disease (CVD), diabetes and cancer – three of the major contributors to premature deaths in Bahrain<sup>1,3</sup>. Nearly one in four adults in Bahrain dies before the age of 70 as a result of an NCD. For Bahrain to remain on track to achieve the United Nations Sustainable Development (SDG) target 3.4 of reduction of premature mortality from NCDs by 2030, obesity needs to be tackled – especially among women.

The government of Bahrain has put in place several mechanisms to combat NCDs and their causes. This includes an NCD National Health strategy 2016–2025 – a multisectoral action plan that integrates NCDs and their shared risk factors and includes targets and indicators based on World Health Organization recommendations. Bahrain has established a National Committee on the Control of NCDs. This comprises representatives from relevant ministries and healthcare organisations, as well as a broad range of stakeholders, including the Bahrain Diabetes Society. In 2018, the outstanding collaborative work of this committee was recognised with an award by the United Nations Inter-Agency Task Force. Guidelines on the management of NCDs in primary healthcare have been implemented. With its Strategic Plan on Physical Activity, Bahrain has raised public



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awareness about diet and physical activity. Furthermore, the GCC NCD Prevention and Control Investment Case to better understand the NCD burden on the economy in Bahrain has been completed. The commitment made by the government of Bahrain to reducing the prevalence of NCDs has boosted public awareness of this issue significantly. However, to ensure sustained progress on combating NCDs, radical action on obesity must be taken. Without action, the alarmingly high prevalence of overweight and obesity among the country's youth will have a devastating effect on the healthcare system and economy in decades to come.

## Obesity in Bahrain

# It is time to change the course of this public health crisis

**Obesity is a disease associated with more than 195 health problems and is a major risk factor for chronic diseases, including CVD, diabetes, and various types of cancer<sup>4</sup>. These obesity-related health problems not only harm individuals, but also drain healthcare resources<sup>5</sup>.**

## The dramatic increase in obesity globally and locally

The worldwide prevalence of obesity has tripled since 1975, and currently affects more than 650 million adults<sup>1</sup>. This increase in prevalence, while common to all countries, has been particularly noticeable in the GCC countries of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE)<sup>2</sup>. In these GCC countries, obesity prevalence in adults ranges from 27.0% in Oman to 37.9% in Kuwait<sup>6</sup>.

## Children and adolescents at risk for poor health

High obesity prevalence has also been noted among children and adolescents living in various GCC countries<sup>7</sup>. In Bahrain, even among the youngest (children under the age of five) obesity is on the rise<sup>6</sup>. Obesity in children is a potential long-term health threat. Children who are overweight or have obesity may carry this excess weight into adulthood, putting them at higher risk for a variety of health ailments, including chronic diseases<sup>1</sup>.

## Multiple factors drive weight gain and the rise in NCDs

Accelerated economic growth due to wealth from natural resources has occurred in a relatively short period for the region and for Bahrain<sup>8</sup>. This growth spurt has resulted in improved living conditions, increased urbanisation and greater spending power for many who live in the region<sup>9</sup>. This has influenced what people eat and has led to an increase in sedentary behaviour among urban populations. These advances have resulted in less healthy lifestyles and have come at the expense of individual health. Excessive weight gain has been coupled with an increase in the prevalence of type 2 diabetes, which already affects more than 7 million adults across the GCC countries (the prevalence ranges from 10% in Oman to 16.3% in the UAE)<sup>10</sup>. One in seven adults in Bahrain have diabetes, a driver of healthcare costs in the country<sup>10,11</sup>.

## Prevention and management of obesity in Bahrain

The inflammatory role that obesity plays in fuelling chronic diseases has been increasingly recognised in the search for solutions to stem the emerging health crisis. As such, more

attention is now being directed – both globally and in GCC countries – towards strategies that can address obesity<sup>12,13</sup>. Evidence that young people and women in the region are at particularly high risk has added a sense of urgency to the situation<sup>14,15</sup>. The prevalence of overweight and obesity can be reduced if governments are willing to invest in effective prevention strategies.

The government in Bahrain has already taken initiatives to encourage physical activity and healthy diets<sup>16</sup>. In addition, local authorities also recognise obesity as a serious chronic disease and are establishing clinical management guidelines for obesity. This opens up possibilities for treatment options to help alleviate the substantial impact of obesity, improve quality of life for individuals and increase the capacity of healthcare systems – helping to change the future outlook on obesity.

## Obesity is a disease

Several professional associations – the American Association of Clinical Endocrinologists (AAACE)<sup>17</sup>, World Obesity Federation (WOF)<sup>18</sup>, the Obesity Society (TOS)<sup>19</sup>, the European Association for the Study of Obesity (EASO)<sup>20</sup>, and Obesity Canada and the Canadian Association of Bariatric Physicians and Surgeons<sup>21</sup> – have recognised obesity as a prevalent, complex, progressive and relapsing chronic disease characterised by abnormal or excessive body fat requiring a 'chronic disease management model'<sup>17-21</sup>.

In addition to this, a survey of 2,785 healthcare professionals in 11 countries (including Saudi Arabia and the UAE) found that 88% of those surveyed considered obesity to be a chronic disease<sup>22</sup>. However, despite the fact that obesity is increasingly being recognised as a chronic disease, it continues to be greatly underdiagnosed and undertreated.

# Obesity and weight management explained

Obesity is a prevalent, complex, progressive and relapsing chronic disease, which is characterised by abnormal or excessive body fat that impairs health<sup>21</sup>.

Obesity occurs when the amount of energy consumed (through food and drink) exceeds the amount of energy expended through activities in daily life<sup>23</sup>. This unused energy is stored in the body as fat. If this pattern is repeated consistently over time, fat will accumulate to the point where it is classified as excess body fat<sup>23,24</sup>.

## Defining and measuring obesity

At what point does a healthy amount of body fat become too much, and when is it defined as obesity? Clinical measurements and definitions of obesity are important because they make it easier for those living with the condition – or at risk of developing the condition – to get the advice and help that they need.

The most convenient population-level indicator of overweight or obesity is body mass index (BMI)<sup>21</sup>. In addition to this, waist circumference measurements can be used to assess an individual's risk for developing

obesity-related complications – a larger waist circumference is associated with an increased risk of complications and mortality<sup>21,24</sup>.

In cases where more comprehensive measurements are required, obesity staging can be used. Obesity staging uses the patient's physiological, psychological and physical status to determine the best weight management for that individual<sup>21</sup>.

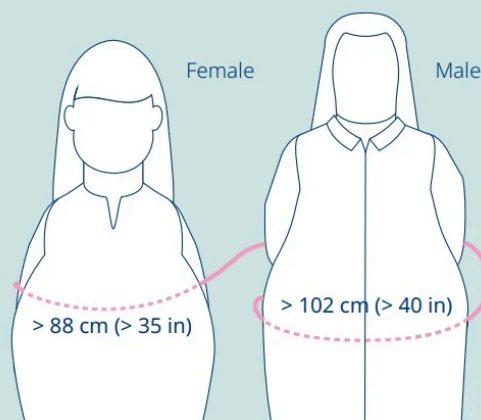
## Obesity in children and adolescents

Weight assessment in children and adolescents is determined by considering both the age of the child and the severity of the obesity. For infants up to the age of two, the infant's weight percentile is compared with their length percentile. For children and adolescents between the ages of two and 20, BMI charts are used for assessing weight. Obesity is defined as two standard deviations above the WHO Growth Reference median<sup>1</sup>.

## Classification based on BMI in adults<sup>25</sup>

Classification	BMI range
Underweight	< 18.5
Normal range	≥ 18.5 and < 25
Overweight	≥ 25 and < 30
<b>Obesity</b>	<b>≥ 30</b>
Obesity, class 1	≥ 30 and < 35
Obesity, class 2	≥ 35 and < 40
Obesity, class 3	≥ 40

## Waist circumference cut-offs to identify increased relative risk for obesity-related complications in adults<sup>26</sup>



\* BMI cut-off points are lower for Asian populations, as Asian populations have different associations between BMI, percentage of body fat, health risk and disease staging from other populations.

# Losing weight and maintaining weight loss can be a struggle

The reasons why people may gain weight or develop obesity are as varied as the people it affects. People with obesity vary in their age of onset, fat distribution, eating behaviours, hunger and satiety cues, cravings, metabolic rates, energy regulation, comorbidities and responses to treatment.

Multiple factors may contribute to obesity. Influencing factors include a person's biology – their genetic, nutritional, physiological and psychological make-up – combined with environmental and socioeconomic determinants inducing the body to store fat<sup>27</sup>. These factors interact with each other and behavioural habits to cause obesity, exacerbating and increasing the risk of developing more than 195 complicating diseases<sup>4</sup>. While the causes of obesity may be complex, the formula to weight management is straightforward: maintaining weight requires a balance between the energy (or calories) taken in and the energy expended throughout the day.

## Why weight loss can be challenging

The human body comes with an in-built defence system to prevent starvation<sup>28</sup>. An important hormone called leptin regulates the body's fat stores<sup>29,30</sup>. When fat levels decrease and leptin declines, the body interprets this as starvation and adapts accordingly, by conserving energy, increasing appetite and decreasing satiation (the feeling of being full)<sup>29,30</sup>. This system is very effective at preventing excessive weight loss, but once you are carrying excess body fat, it defends the higher fat level just as effectively<sup>31</sup>.

While an individual may be committed to losing weight, the role leptin plays in maintaining the body's fat stores by causing increases in hunger and changes to the metabolism can make this particularly difficult. Weight loss in people with obesity causes changes in appetite hormones that increase hunger and the desire to eat for at least one year<sup>23</sup>.

## Weight can be managed with appropriate strategies and treatment (if necessary)

Proven strategies to fight weight gain and reduce abdominal fat – which is linked to a variety of health

problems – include adopting behaviours that can help overcome the biology: monitoring weight, eating regular and nutritious meals and partaking in daily physical activity<sup>28,31</sup>. **However, almost 80% of people experience weight regain after following a regimen of diet and exercise<sup>32</sup>.**

In some cases, prescription medicine or surgery may be recommended. However, as the population of people with obesity is quite broad – with individuals being widely dissimilar physiologically and clinically – the way they respond to treatment also varies. Therefore, a single choice of treatment does not necessarily suit all patients. There is also a broad distribution of responses to weight loss treatments, including healthy lifestyle changes, pharmacotherapy and bariatric surgery. Equipping local healthcare professionals with the appropriate tools and knowledge to help people living with obesity to manage their condition in the long term and maintain a healthy weight is thus equally important.

## How the body responds to weight loss in favour of weight regain

*Increased hunger and decreased fullness drive weight regain<sup>23,28,32</sup>*





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Overweight and obesity are common across a wide sphere of society in Bahrain. The country has experienced some of the most acute increases in obesity prevalence reported worldwide – most notably among girls and women<sup>15,33</sup>.

## Adults

Obesity has escalated to epidemic levels in the GCC countries<sup>2</sup>. Increases in the burden of overweight and, in particular, obesity for the region, and more specifically for Bahrain, are among the most severe reported worldwide<sup>15</sup>. Looking at the broader Eastern Mediterranean region, the World Health Organization has highlighted Bahrain along with Jordan, Egypt, Kuwait, Saudi Arabia and the UAE as the countries in the region where overweight and obesity prevalence rates are highest<sup>34</sup>. The data taken from 16 countries further showed that while overweight is more marked in men, women have much higher levels of obesity<sup>34</sup>.

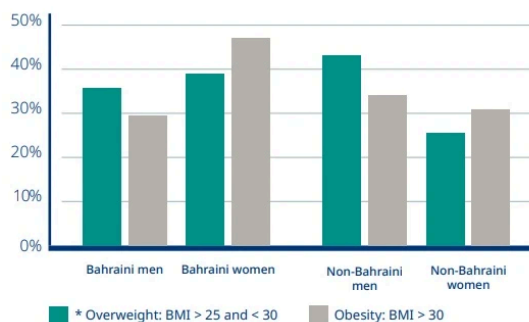
National estimates for overweight and obesity in Bahrain have reported similar gender-based findings<sup>33,35</sup>. The recent Bahrain National Health Survey 2018 estimates that among Bahraini citizens, one-third of adults over the age of 18 are overweight and 42.8% have obesity<sup>33</sup>. When these two categories were combined for all survey respondents, a third of whom were non-Bahraini nationals, higher levels of overweight and obesity were observed among Bahraini nationals compared with non-Bahraini citizens (76% versus 65.5%)<sup>33</sup>.

In addition, overweight was also more common in men of Bahraini nationality than among their female counterparts (36.1% versus 29.7%), while the opposite

was true for obesity, with 47.2% of Bahraini women (nationals) having obesity compared with only 39.2% of Bahraini men<sup>33</sup>.

Due to differences in the age groups surveyed, it is difficult to make a direct comparison between the two national surveys (2007 and 2018)<sup>33,35</sup> to determine the increase in overweight and obesity for this period.

**Figure 1: Overweight and obesity prevalence among men and women in Bahrain, 2018<sup>33\*</sup>**



*Among Bahraini nationals, obesity was 8% higher among women (47.2%) than among men (39.2%); overweight was higher in men (36.1%) than in women (29.7%).*

*Among women, obesity was 17% higher among Bahraini nationals (47.2%) than among non-Bahraini nationals (30.6%).*

## Obesity in Bahrain

However, NCD Risk Factor Collaboration (NCD-RisC) data confirm that obesity has risen steadily for men and women since 1975<sup>7</sup>. Another global prevalence study, however, singled out Bahrain as one of the countries worldwide having experienced the largest increases in rates of obesity for women over a five-year period (2008–2013)<sup>15</sup>. This suggests that obesity in women could be a focal point for intervention. The current health survey (2018) also indicated that, by age, the highest percentage of obesity was found among those aged 45–59. Obesity also seems to be concentrated in people with the highest and lowest education as well as in the higher wealth segments of society<sup>33</sup>.

## Children and adolescents

Childhood obesity is associated with a higher likelihood of obesity in adulthood, premature death and disability<sup>1</sup>. Beyond the impacts on physical health, children with overweight are more likely to perform poorly in their school work, be absent from school and experience bullying, all of which contribute to lower life satisfaction<sup>12</sup>. Addressing childhood obesity early on is therefore important from the perspective of the individual, but also for the benefit of society.

For Bahrain, the World Health Organization statistics indicate that the prevalence of obesity in very young children (aged one to five) is merely 1.3%<sup>6</sup>. However, in this age group, the percentage of children with

overweight doubled over five years from 2.3% in 2013 to 4.9% in 2018<sup>6</sup>.

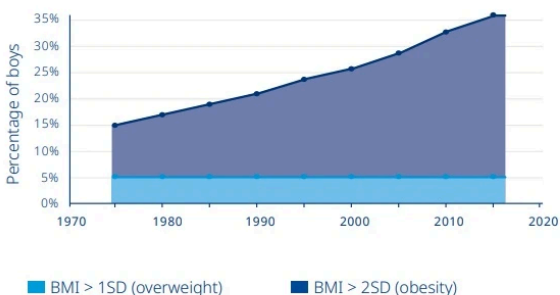
According to NCD-RisC, for both girls and boys between the ages of five and 19 in Bahrain, overweight has escalated in the past 40 years (since 1975)<sup>7</sup>. NCD-RisC data report that overweight affects one in every three boys (36%) – more than twice as many as in 1975 – with about the same percentage for girls<sup>7</sup>. Girls, on the other hand, are three times more likely to have obesity than boys, and this percentage has risen in girls from 6% in 1975 to 16% in 2016<sup>7</sup>.

The rate of obesity in boys has remained at 5% for the entire period<sup>7</sup>. Furthermore, as children grow up and become adolescents, they appear to gain weight. Figures from the school screening programme published in 2019 alarmingly indicate that overweight and obesity may be as high as 40.4% in boys and 45.5% in girls between the ages of 10 and 12<sup>36</sup>.

High levels of overweight and obesity in girls entering puberty signal a red flag, as weight retention may persist as they grow older. In Bahrain, almost half of the adolescent girls (aged 12–15) who visited primary care health centres were in the above-normal weight range<sup>37</sup>. Excess weight in women during their reproductive years comes at a cost to society, as it puts women and their offspring at risk for poor health outcomes, both in pregnancy and later in life<sup>38</sup>.

**Figure 2: Prevalence increase in overweight and obesity in boys between 1975 and 2016 in Bahrain, BMI<sup>7</sup>**

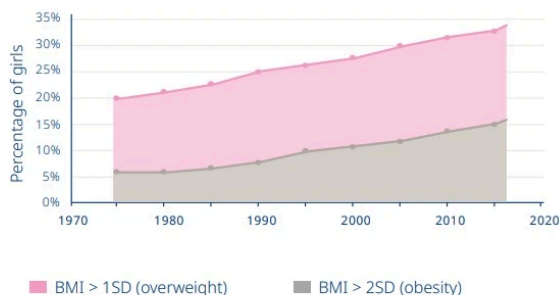
*Between 1975 and 2016, the prevalence of overweight more than doubled for boys, rising from 15% to 36%, while the prevalence of obesity remained constant.*



NOTE: > 1/2SD = standard deviation above the WHO growth standard median

**Figure 3: Prevalence increase in overweight and obesity in girls between 1975 and 2016 in Bahrain, BMI<sup>7</sup>**

*Between 1975 and 2016, the prevalence of overweight rose considerably from 20% to 34% in girls, and, over the same period, the prevalence of obesity increased from 6% to 16%.*



# Multiple factors are responsible for the obesity crisis

Obesity is a complex condition that is driven by an interplay between genetics, intrapersonal characteristics and the environment<sup>21</sup>. Understanding what these factors are and how they interact can guide intervention efforts.

Body weight is influenced by a number of individual, behavioural and lifestyle factors<sup>27</sup>. Obesity, which develops gradually over a long period of time, is often the result of poor diet and lifestyle choices, many of which are frequently learnt in childhood<sup>21,27,39</sup>.

There is evidence that counselling combined with changes to the food and physical environment can support at-risk individuals in their efforts to make healthy choices that will help them to manage their weight<sup>12,26</sup>. A better understanding of the interplay between the multiple factors that influence obesity can improve the design of local obesity prevention programmes<sup>14</sup>.



## Internal factors



### Prenatal influences

A mother's body weight and blood glucose levels (specifically gestational diabetes), all shape foetal nutrition and health later in life<sup>38</sup>.



### Biological influences

A person's genetic make-up, including hormonal factors regulating metabolism, gut microbiota and ageing, influence whether they can lose or maintain weight<sup>27,31,40</sup>.



### Psychological disorders

Psychological disorders, such as depression and other mental illnesses, may result in individuals having difficulties managing their food intake and sustaining regular physical activity<sup>41</sup>.

## External factors



### Early life experiences

A lack of breastfeeding, sleep deprivation, malnutrition and a sedentary lifestyle are early life experiences that can increase the risk of obesity later in life<sup>27</sup>.



### Environmental influences

Environmental influences related to an individual's surroundings, such as the availability of healthy food options or safe spaces can have a profound impact on their actions, influencing their diet and physical activity on a daily basis<sup>42,43</sup>.



### Economic position

Wealth, or a lack thereof, can be a determinant for obesity. People in low-income groups in developed countries are at greater risk of becoming overweight or having obesity, due to limited access to healthy food options<sup>42,44-46</sup>.



### Societal factors

Societal factors (eg the food environment, cultural preferences and socioeconomic status) or personal level factors (eg social facilitation of eating and parental feeding practices) may add to weight gain<sup>46</sup>. Social inequalities in overweight and obesity are strong, especially among women<sup>42</sup>.

## Obesity in Bahrain

# Determinants of health driving obesity in the region

Several factors have been noted that influence overweight and obesity in the region and in Bahrain.

## The changing food environment and its influence on healthy eating

Globalisation and urbanisation have been driving the increase in overweight and obesity all over the world, including in the region<sup>47,48</sup>. Urbanisation has dramatically changed the food environment and, in many countries, a 'nutrition transition' has taken place: diets characterised by high-fibre and low-fat foods have been replaced by those comprising energy-dense, high-calorie alternatives<sup>47,48</sup>.

As markets have become more accessible and integrated with the global economy, there has been a proliferation of supermarkets and global fast-food chains in most countries<sup>47</sup>. For its small population size, Bahrain has a high number of shopping malls as well as supermarkets/hypermarkets, and there has been an influx of international food retailers.

## The increased availability and consumption of processed food

Processed foods, which are now widely available, calorie dense, nutrient poor and high in salt, fats and sugars – and are significantly cheaper than healthier unprocessed alternatives – are being consumed far more often<sup>31</sup>. Processed or fast foods are acknowledged to be a risk factor for obesity<sup>49</sup>. Due to cultural restrictions on young women in Bahrain and the ease of home delivery from fast-food restaurants, they tend to eat more takeaway foods at home than young men of the same age<sup>50</sup>.

## Sugar-sweetened beverages

Global consumption of sugar-sweetened beverages (SSBs), which have been strongly linked to overweight and obesity, especially in children, has also risen considerably<sup>51,52</sup>. Two-thirds of adults in Bahrain consume soft drinks, and only 8.3% drink low-calorie or 'diet' alternatives<sup>35</sup>.

## Marketing of unhealthy foods to children

Typically, processed foods and SSBs are heavily promoted. Children, in particular, are vulnerable to messaging from television advertising, which is still a widely used medium<sup>53</sup>. A 2011 study from Bahrain found that television food advertisements preferred by children (aged five to 12) were related to fast foods (43%), chocolate and sweets (41%), milk (40%) and soft drinks (38%)<sup>53</sup>.

## Insufficient daily intake of fruit and vegetables

Fruit and vegetables are important components of a nutritious diet, offering a protective effect against obesity<sup>33</sup>. Yet only one in seven adults in Bahrain eat sufficient fruit and vegetables on a typical day<sup>33</sup>. In addition to this, foods that are high in calories play a significant role in social gatherings<sup>2</sup>, making it challenging for individuals seeking to make healthier food choices.



The vast majority of adults in Bahrain do not eat five servings of fruit and vegetables, as recommended<sup>33</sup>.

## The environment and its influence on physical activity

Urban environments have been linked to reduced levels of physical activity, which, together with obesity, are a well-known risk factor for NCDs<sup>47,54</sup>. Prevalence estimates for participation in physical activity in the GCC countries are considerably lower than those for many developed countries<sup>55</sup>. This has been attributed to several factors, including the extreme heat (which limits outdoor activities), the heavy reliance on cars for transportation and occupations that are less physically demanding<sup>8,9,49,55</sup>.

Global recommendations on physical activity for health in adults advise that individuals should do at least 150 minutes of moderate-intensity aerobic exercise per week, such as brisk walking, gentle jogging, swimming or cycling<sup>56</sup>. Half of adults in Bahrain attain this target<sup>33</sup>.



**Older adults (aged 40–69) living in Bahrain – in particular, women – walk less than one kilometre a day during the week<sup>53</sup>**

Physical activity has a variety of health benefits, including improved mental well-being<sup>57</sup>. Low levels of physical activity, on the other hand, have been noted in individuals in Bahrain struggling with depression. These individuals also have higher levels of obesity than those who are not depressed<sup>41</sup>.

#### **Gender as a barrier to physical activity**

Several studies have highlighted that, in many countries in the Arabic-speaking world, men are more active than women because of conservative social norms and cultural restrictions on outdoor activities and exercise for women<sup>55</sup>. Not only are girls in Bahrain at intermediate school more likely to have obesity, they are also less physically active than boys their age<sup>36</sup>. In fact, 80% of boys were active for 30 minutes at least four to six times per week, compared with only 64% of girls<sup>36</sup>.

This gender disparity continues into adulthood: even among young, educated, qualified women in Bahrain, much lower levels of activity were reported than in their male co-workers<sup>58</sup>. Women perceived the main sociocultural barriers to practising physical activities to be home commitments (49%), caring for children (36%) and negative attitudes from family members towards women exercising/practising sport (24%)<sup>53</sup>.

#### **Sedentary behaviour among the youth**

As is the case elsewhere in the world, people in this region are spending more time in front of screens – watching television, using the internet and playing computer games – than they did in the past<sup>53</sup>. Physical inactivity, increased screen time and higher social status are well-recognised risk factors for childhood obesity regionally<sup>14</sup>. Research has shown that schoolchildren in

Bahrain who are overweight or have obesity are likely to watch more television and play more electronic or computer games than those who are not<sup>52</sup>. Close to 60% of adolescents who have obesity in Bahrain eat lunch and supper while watching the television; only 46% of those who did not have obesity watched television while eating<sup>53</sup>.

On the other hand, physical activity at a young age appears to lower the risk for obesity in adolescents. A survey from Bahrain of students aged 11 and 12 found that those who were physically active had a significantly lower likelihood of being overweight or having obesity<sup>36</sup>. School-based programmes that promote a healthier diet and additional physical activity have been shown to lead to a reduction in BMI<sup>12</sup>.



Skateboarder at Bahrain Financial Harbour  
© iStock

## Obesity in Bahrain

# Impact of obesity

Obesity has far-reaching consequences for individuals and society. It impacts the lives of individuals and their families in several ways and has significant economic impacts for society.

## The health of individuals

People living with obesity are at higher risk of developing other diseases, such as type 2 diabetes, CVD, high blood pressure, sleep apnoea and certain types of cancer, compared with people without obesity<sup>59-62</sup>. As a result of this, a person with obesity has a significantly increased risk of dying up to 10 years earlier than the general population<sup>63</sup>.



### Cardiovascular disease

Obesity directly affects the cardiovascular system and is associated with numerous heart complications, including congestive heart failure, arrhythmia (abnormal heart rhythm), coronary artery disease and stroke<sup>64</sup>. CVD is among the leading causes of death in people with obesity<sup>65</sup>.



### Hypertension

Excess weight gain – particularly excessive abdominal fat – is a major risk factor for hypertension<sup>66</sup>. In individuals with hypertension, an increase in body weight can be linked to earlier onset of type 2 diabetes<sup>67</sup>. One in three people with obesity are reported to have hypertension<sup>68</sup>.



### Type 2 diabetes

Men and women living with obesity are between seven and 12 times more likely to develop type 2 diabetes than individuals without obesity<sup>69</sup>. A survey of patients at primary healthcare diabetes clinics in Bahrain found that more than half of those surveyed (56.6%) had obesity<sup>1</sup>.



### Cancer

Excess body weight is associated with a higher risk of several types of cancer and contributes to as many as 20% of all cancer-related deaths<sup>69</sup>. Specifically, obesity has been associated with breast, colon, rectal, endometrial, oesophageal, kidney and pancreatic cancer<sup>69</sup>. Obesity was found to be common in patients aged 30–60 receiving cancer treatment in Bahrain<sup>70</sup>. A high BMI was observed mostly among breast and colon cancer patients<sup>70</sup>.



### Dyslipidaemia (abnormal lipid profile)

Approximately 60–70% of people receiving treatment for obesity have dyslipidaemia<sup>71</sup>, which is an abnormal blood lipid profile that increases the risk of CVD<sup>72</sup>. The prevalence of dyslipidaemia in people with obesity is reported as 49.7%<sup>68</sup>.



### Joint problems

Osteoarthritis, a painful joint disease that occurs when the cartilage between joints is eroded, can affect the hands, knees, hips, back and neck. Carrying excess weight increases the burden placed on joints such as knees, causing pain and possibly hastening the breakdown and subsequent loss of cartilage<sup>73</sup>. Women in Bahrain over the age of 40 with osteoarthritis of the knees are inclined to be overweight or have obesity<sup>74</sup>.



### Impaired physical functioning

Impaired physical functioning, which may include limitations in mobility for activities such as walking and dressing, has been associated with obesity. The higher the BMI, the greater the risk of impaired physical functioning<sup>73,75</sup>.



### Sleep apnoea

The prevalence of obstructive sleep apnoea syndrome (OSAS), which is characterised by recurrent episodes of partial or complete obstruction of the upper airway during sleep, is reported to be as high as 45% in people with obesity<sup>76</sup>.



### Mental health

Certain medicines to treat mental conditions have been linked to weight gain, and obesity is more prevalent in people with mental illnesses such as bipolar disorder, schizophrenia or depression<sup>21</sup>. In turn, patients with depression living in Bahrain were observed to be twice as likely as people without depression to develop obesity, type 2 diabetes, hypertension or musculoskeletal disorders<sup>41</sup>.

## The societal impact of obesity

Obesity has substantial direct and indirect costs that put a strain on healthcare systems and social resources<sup>57,77</sup>. As the average life expectancy increases and the prevalence of obesity continues to rise, countries across the globe are having to contend with the costs of obesity<sup>78</sup>.

Chronic diseases such as diabetes, cancer and CVD put immense pressure on healthcare systems. Since these chronic disease are largely preventable – and obesity is a risk factor for all of them – some of this healthcare expenditure could be avoided by tackling obesity<sup>1,12</sup>.

### Direct costs of obesity

The direct costs of obesity can be separated into the medical costs of obesity itself and the cost related to obesity-related comorbidities<sup>78</sup>. People who are overweight use healthcare services more, undergo more surgery and have more than twice as many prescriptions as people of a healthy weight<sup>79</sup>. These costs increase with the severity of the obesity<sup>57</sup>.

The direct costs of obesity differ according to population and place, but estimates range between 2% and 20% of total healthcare expenditure, depending on the

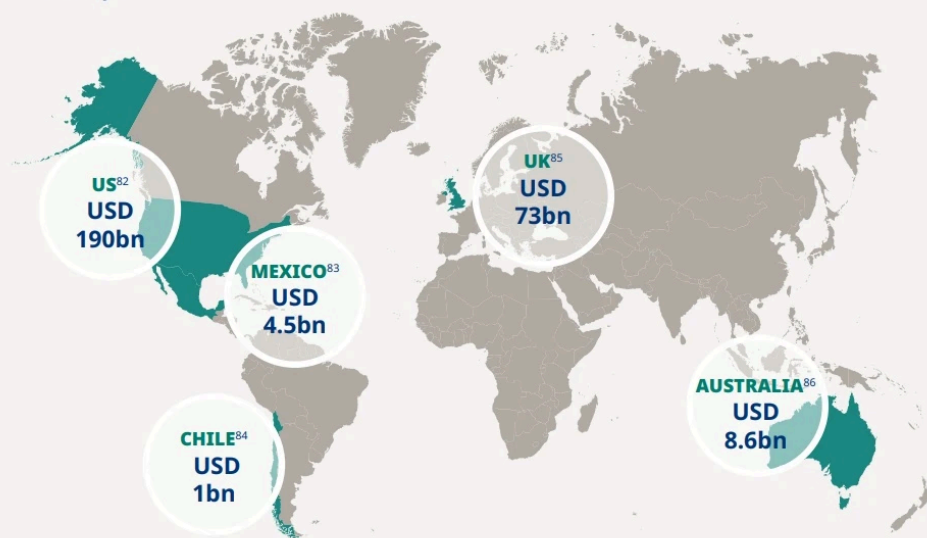
country in question<sup>78</sup>. Recent calculations modelled by the Organisation for Economic Co-operation and Development (OECD) in 2019 show that, under a business-as-usual scenario, treating the diseases caused by obesity will cost an average of 8.4% of total healthcare spending (net of spending for long-term care)<sup>12</sup>. The United States, for example, where 40% of adults over the age of 20 have obesity, will spend nearly 14% of its health budget on addressing overweight and obesity<sup>12,80</sup>. Over a lifetime, the direct incremental medical costs of individuals identified with obesity today as 10-year-olds living in the US are predicted to add up to billions of US dollars – money that could be spent on education, for example<sup>57</sup>.

### Indirect costs of obesity

More than half (54–59%) of the obesity-related economic burden is a result of indirect costs. However, these costs are not often well documented<sup>81</sup>. Indirect costs relate to income lost as a result of decreased productivity, reduced opportunities and restricted activity, illness, absenteeism and premature death.

## Obesity-related costs in other countries

In Saudi Arabia, where the prevalence and associated healthcare costs of obesity are reportedly similar to those in other GCC countries, the government spends more than 19 billion riyals (5.46 billion US dollars) annually fighting the burden of obesity<sup>2</sup>.



**Obesity is a risk factor for diabetes and, thereby, indirectly helps to drive up healthcare costs.**

*A study on type 2 diabetes and healthcare utilisation in the Kingdom of Bahrain found that the average cost per person was three times higher for those with diabetes than for those without diabetes<sup>11</sup>.*



**There is no single or simple solution to the obesity challenge. No individual sector in society – including governments and healthcare providers – is capable of addressing the situation on its own<sup>85</sup>.**

Obesity is a complex problem with multidimensional causes that are embedded in the environments in which people live. As such, the remedy needs to be multifaceted and include policies to tackle unhealthy lifestyles that target broad population groups instead of focusing exclusively on individuals with excess weight<sup>12,42</sup>. While a public health approach to developing population-based strategies for the prevention of excess weight gain is crucial, public health intervention programmes have, thus far, had limited success in overcoming the rising prevalence of obesity<sup>87</sup>.

That said, the ability of governments to design, implement and evaluate wide-ranging prevention strategies integrating the strengths of different policy approaches is crucial for achieving success<sup>12</sup>. This includes initiatives that are promoted in collaboration with various stakeholders. Based on successful examples, a mixture of top-down government and corporate interventions together with bottom-up community-led interventions is necessary to alter public health outcomes<sup>85</sup>.

Therefore, multi-component, multi-level interventions are needed to tackle the complexity of the challenge, and these approaches are showing promising results, particularly when they are able to combine components at policy, community and interpersonal levels<sup>88</sup>. Moreover, there is evidence to suggest that multiple intervention strategies have the potential to achieve greater health gains than individual interventions, and often with improved cost-effectiveness<sup>12,42</sup>. However, more targeted policies can also be impactful, particularly when they focus on higher-risk populations<sup>12</sup>.

#### **Population-based prevention approaches<sup>89</sup>**

Population-based obesity prevention approaches can be divided into three broad components: structures within government, population-wide policies and community-based interventions. To be effective, prevention strategies need to incorporate all three components and involve a wide range of stakeholders.

1. **Structures within government** – To support and enhance the effectiveness of direct policy initiatives and community-based interventions, certain structural elements – such as leadership, workforce capacity and monitoring systems for NCDs – need to be in place.
2. **Population-wide policies** – Population-wide policies refer to instruments such as laws and regulations, taxes and subsidies, and social marketing campaigns that affect the population as a whole or large population groups.
3. **Community-based interventions** – Community-based interventions are multi-component interventions that combine individual and environmental change strategies as well as leverage social structures and involve the community to promote well-being among population groups within the community.



Street view of Amwaj Islands  
© Istock

## Creating enabling environments for healthy living

Environments that support healthy diets and physical activity are critical in tackling the obesity challenge. Creating supportive environments typically requires policy changes, particularly in the areas of food marketing and nutritional labelling, fiscal policy, urban planning, transport and agriculture<sup>12,85</sup>. Individuals also need to be given the tools they require to make informed choices. It is recommended to:

### Empower individuals

Enable individuals to take control of their health and its determinants through health literacy efforts and multisectoral action to increase healthy behaviours. Effective actions by policymakers include promoting healthy nutrition throughout life.



*Nutritional labelling has been shown to encourage healthier eating among people who read the labels and has been recognised as the most effective intervention<sup>90</sup>.*

### Enable healthy food choices

In a healthy food environment, everyone has affordable access to fresh fruit and vegetables and whole foods. Aim to make healthier options available for prepared and pre-packaged foods.

### Enable physical activity

Encourage individuals to be more physically active by adapting the way in which a community is built. Prioritising recreational spaces in city planning and facilitating safe walking and cycling, combined with community designs that discourage urban sprawl, can increase everyday opportunities to be active.

### Support families

For children and young people, families are one of the most important and enduring influences on choices – health and otherwise. Help parents to steer children in directions that lay the foundations for lifelong good health.

### Promote health in schools

The school environment also plays an important role in obesity prevention, as children and young people spend much of their time in school. Integrate nutrition and physical activity lessons into the curriculum in core classroom subjects, provide physical education and after-school programmes that teach students skills to help them maintain healthy, active lifestyles.

### Promote health in places of work

For many people, the majority of the day is spent in a workplace. As such, the workplace is an efficient channel for improving health and targeting the factors driving obesity. Encourage employers to use different means to provide employees with the knowledge, skills and support that they need to eat a healthier diet and be more active.



To comprehensively treat obesity, a country needs to focus on disease awareness, the availability of specialist clinicians, early diagnosis and access to specialty care for everyone, from paediatric patients to the elderly. This includes long-term access to specialised medicine for treating obesity<sup>31</sup>.

An efficient healthcare system should provide cost-effective treatments for all chronic diseases, including obesity<sup>91</sup>. By treating the medical consequences of a high BMI, healthcare systems are able to reduce the risk that patients will develop related chronic diseases and thus reduce the burden of obesity<sup>12</sup>.

#### **Obesity is associated with significant unmet clinical needs**

However, despite an increased focus on obesity, there are still significant unmet needs in obesity management. At present, only a few people living with obesity receive clinically proven lifestyle, pharmacological and/or surgical interventions<sup>92</sup>. Efficacious interventions are urgently needed to minimise the adverse impact and cost


consequences associated with obesity. Roadblocks to comprehensive care include a lack of formal diagnoses and insufficient dialogue on obesity<sup>92</sup>.


Like other chronic conditions, such as hypertension or diabetes, obesity requires ongoing management. Without treatment, the condition will worsen and, if treatment is stopped, it will reoccur<sup>21</sup>. The first step in obesity management is to prevent further weight gain<sup>21,26</sup>. Weight loss of 5–10% in a person living with diabetes can reduce the risk or severity of some obesity-related diseases<sup>24,93–98</sup>. In adults with a high BMI, even marginal weight loss has significant health benefits, and deliberate weight loss may be associated with an approximate 15% reduction in all-cause mortality<sup>99</sup>.

## The health benefits of 5–10% weight loss


A weight loss of 5% or more can improve overall health and weight-related complications in a person living with obesity<sup>24,93–98</sup>

Weight loss reduces...

 ... the risk of type 2 diabetes<sup>93</sup>

 ... cardiovascular risk factors<sup>94</sup>

Weight loss improves...

 ... blood lipid profile<sup>94</sup>

 ... osteoarthritic pain<sup>96</sup>

 ... blood pressure<sup>94</sup>

 ... health-related quality of life<sup>95</sup>

 ... severity of obstructive sleep apnoea<sup>97,98</sup>

## Clinical evaluation of obesity

The Canadian Adult Obesity Clinical Practice Guidelines provide perhaps the most extensive (and most recently updated) review of published evidence conducted worldwide to date<sup>21</sup>. The guidelines suggest that healthcare providers involved in screening, assessing and managing people living with obesity should use the 5As framework (Ask-Assess-Advise-Agree-Assist) to initiate the discussion by asking for the patient's permission and assessing their readiness to initiate treatment<sup>21</sup>. Furthermore, guidance is provided using the Edmonton Obesity Staging System (EOSS)<sup>100</sup> to determine the severity of obesity and to guide clinical decision-making<sup>21</sup>. EOSS is the measure of the mental, metabolic and physical impact that obesity has had on a patient's health; these factors determine the stage of obesity (0–4)<sup>21</sup>.

## Individual measures to manage overweight and obesity

A modern approach to obesity acknowledges both the health benefits that can be derived from weight loss and the multifactorial determinants of weight gain. International treatment guidelines recommend the implementation of comprehensive evidence-informed lifestyle interventions to support individuals in their efforts to lose weight and maintain weight loss. These interventions should include lifestyle or behavioural training, dietary changes and an increase in physical activity<sup>21,26,101–103</sup>.



**The weight loss achieved with these interventions is usually 3–5% of body weight, which can result in meaningful improvements in obesity-related comorbidities<sup>21,24,104</sup>.**

## Three approaches to treating obesity



**Lifestyle changes – healthy eating and physical activity**



**Pharmacotherapy**



**Bariatric surgery**



### Lifestyle changes

Healthy eating and physical activity must be part of any weight loss intervention, but these lifestyle changes are not always enough to maintain weight loss<sup>24</sup>. In some cases, multiple treatments are necessary. These treatment options include weight loss medications – to be initiated concurrently with lifestyle changes – and bariatric surgery in the case of obesity with severe complications<sup>24</sup>.



### Pharmacotherapy

Pharmacological treatment should be considered as part of a comprehensive disease management strategy<sup>105</sup>. Pharmacotherapy can help patients to maintain compliance, reduce obesity-related health risks and improve quality of life<sup>105</sup>. It can also help to prevent the development of obesity comorbidities (eg type 2 diabetes)<sup>105</sup>. However, it must be noted that, in general, few pharmacological treatment options are available at present for clinical prescription, and even less so among countries in the region<sup>106</sup>.

The Canadian Adult Obesity Clinical Practice Guidelines<sup>21</sup> recommend adjunctive pharmacotherapy for weight loss and weight loss maintenance for individuals with a BMI of  $\geq 30$  or a BMI of  $\geq 27$  with adiposity-related complications, to support medical nutrition therapy, physical activity and psychological interventions<sup>21</sup>. Options include liraglutide 3.0 mg, the naltrexone–bupropion combination and orlistat<sup>21</sup>. Pharmacotherapy can help achieve greater weight loss than behavioural changes alone and is important in the prevention of weight regain<sup>21</sup>. There is also a role for pharmacotherapy after bariatric surgery, as 10–20% of all patients will regain the weight lost as a result of the surgery<sup>107</sup>.



### Bariatric surgery

Bariatric surgery can be malabsorptive or restrictive, with each type requiring different lifestyle changes<sup>108</sup>. It is the third-line and most efficient intervention for obesity management and is a common treatment for morbid obesity<sup>109</sup>. The Canadian Adult Obesity Clinical Practice Guidelines<sup>21</sup> recommend that bariatric surgery may be considered for people with a BMI of  $\geq 40$  or a BMI of  $\geq 35$  with at least one obesity-related disease<sup>21</sup>.

The decision regarding the type of surgery should be made in collaboration with a multidisciplinary team, balancing the patient's expectations, medical condition and expected benefits against the risks of the surgery<sup>21</sup>. In many places, however, patients face the challenge of a long waiting list, which can delay surgery for an extended period.

## Obesity in Bahrain

In general, bariatric surgery is safe and effective, with an average weight loss of 28.9% one year after surgery. As a treatment, it has been shown to have a profound effect on the improvement of diabetes and other comorbid conditions such as hypertension and dyslipidaemia<sup>110</sup>. This has impelled such operations to be considered as 'metabolic surgery' used expressly to treat type 2 diabetes, including among patients with a BMI of < 35<sup>111</sup>. Metabolic/bariatric operations yield type 2 diabetes remission in many cases<sup>111</sup>.

However, bariatric surgery can cause new clinical problems and is associated with specific diagnostic, preventive and therapeutic needs<sup>109</sup>. Food intolerance (with vomiting as the most common complaint) and disordered eating behaviours, including bingeing, grazing and stress eating, have been reported post-surgery in patients in Bahrain. These side effects have affected weight loss outcomes<sup>112</sup>. A study from Bahrain found that the majority of patients who underwent bariatric surgery five years previously had obesity on reassessment<sup>113</sup>. Therefore, multidisciplinary long-term follow-up is recommended after bariatric surgery, and the provision of an adequate follow-up programme is mandatory for bariatric centres<sup>109</sup>.

## Treatment and care of people with obesity in Bahrain

Bahrain has a good primary healthcare system that is efficient in the risk assessment and diagnosis of obesity. It also has a good tertiary system with specialists for disease management, and a multidisciplinary approach is in place. Bariatric surgery is available in one public hospital. Furthermore, with the implementation of national health insurance and the accompanying National Electronic Medical Record (NEMR), data can be easily tracked and shared at a national level regarding the prevalence and trends of obesity in the country<sup>114</sup>.

Potential gaps in the system relate to out-of-pocket payments for medications to treat obesity, a shortage of dieticians available to work with patients on obesity prevention and management and to support patients following bariatric surgery, and a tendency for patients who have had bariatric surgery to fail to comply with medical advice and subsequently regain weight. A multipronged approach that includes pharmacotherapy has been proposed. The National Guidelines for the Management and Treatment of Obesity in the Kingdom of Bahrain, which have recently been finalised, are expected to be released in March 2021.

## Modern pharmacological treatment of patients with obesity<sup>115</sup>

Adapted from May M, Schindler C, Engeli S. Modern pharmacological treatment of obese patients. *Ther Adv Endocrinol Metab*. 2020

Several drugs have been developed specifically to reduce body weight; some of these have gained marketing authorisation during the last five years, while others are still in development.

Of course, not every person living with obesity needs pharmacological treatment for weight loss. Exercise, diet and behaviour modification should always be the cornerstones of anti-obesity treatment. However, many affected patients do not lose weight, or fail to maintain weight loss, with that approach. There is consensus that anti-obesity drug treatment may be considered for individuals who fail to respond to lifestyle interventions after six months of treatment, and have a BMI of > 30, or > 27 with weight-associated comorbidities. However, weight reduction should not be the main treatment goal.

Improvement in obesity-associated comorbidities such as hyperglycaemia and hypertension are at least of equal importance. Furthermore, expectations with regard to weight loss efficacy are often very unrealistic. Patients and healthcare providers should realise that the efficacy of available anti-obesity drugs is often limited to a 5–10% reduction in body weight over a one-year period. Drug-induced weight loss typically does not occur for more than six to eight months. Obesity is a chronic disease and requires long-term treatment. Unfortunately, many patients and healthcare providers still do not act according to this concept.

No one would suggest discontinuing antidiabetic medication when haemoglobin A1c (HbA<sub>1c</sub>) is improved after starting a new medication.

# Action underway in Bahrain

*A 50% tax increase on carbonated high-calorie drinks and a 100% tax increase on energy drinks have been implemented in Bahrain.*



## Bahrain National Health Survey 2018<sup>33</sup>

The Ministry of Health (MOH) and the Information & eGovernment Authority jointly conducted a National Health Survey (NHS) during the period from August 2017 to April 2019 to track the health and risk factors, as well as lifestyle

practices, of Bahrain residents (Bahraini and non-Bahraini). The aim of the survey was to provide reliable, realistic and comparable health data for the government, health providers and stakeholders to measure progress and determine where to focus resources so that health outcomes can be improved and the community can become healthier.

## Mobile unit to tackle obesity among children<sup>16</sup>

In 2015, the first mobile unit dedicated to combating obesity in children was unveiled in Bahrain, whereby nursing students teach primary school pupils about healthy lifestyle through games. The unit, a converted truck, is run by the Royal College of Surgeons in Ireland

(RCSI) and has been used to conduct health examinations and educate young people about the risks of obesity.

## Nutrition clinics<sup>17</sup>

The first nutrition clinic was established in 2007 due to the high number of patients with obesity locally. The clinic has achieved significant success in reducing obesity and limiting the risk of complications due to the condition. The clinic is open to adults between the ages of 20 and 60, as well as adolescents from the age of 12. Services offered at the clinic include assistance in creating a healthy food plan, nutritional counselling and encouragement in adopting healthy eating habits.

## Walking challenge

Following the success of the original programme in 2019, the Bahrain Diabetes Society has launched its second 'walking challenge'. The purpose of the challenge is to raise awareness about the benefits of exercise as part of a healthy lifestyle. Participants commit for a period of three months to a 30-minute walk, five days a week. To encourage participation, there is a weekly group walking activity in one of the healthy shopping centres or walking tracks.



Walking challenge by the Bahrain Diabetic Society  
© deveritt/iStock



# An individualised approach to obesity management

© Dreamstime

**Obesity is a complex, chronic disease with many contributing factors that challenge primary care and obesity medicine specialists alike. To achieve sustainable weight loss, long-term intervention is often required<sup>24</sup>. However, without access to properly trained specialist providers, most people who have obesity will not be able to reach and maintain a healthy long-term weight goal<sup>31</sup>.**

According to the principles of chronic disease management, healthcare professionals need to work collaboratively with patients to determine appropriate therapeutic strategies that address overweight and obesity, specifically considering a patient's disease status in addition to their individual needs, preferences and attitudes regarding treatment.

**However, care provided by a properly trained clinician who either specialises in obesity medicine or has extensive training in the use of anti-obesity medication and treatment plan options is still not readily available in most areas.**

Recent advances in lifestyle management and pharmacotherapy interventions have provided clinicians with more and better options to reduce morbidity and improve quality of life for adults with obesity<sup>26</sup>. Many resources and tools have become available to help individuals with weight loss efforts, including a wide range of diet options, activity monitors, social networks and structured weight loss programmes<sup>118-120</sup>. A valuable tool for measuring the quality of life of patients with obesity – which has been validated with a cohort of patients in Bahrain – is the six-factor model of the SF-36 questionnaire that can be used in healthcare decision-making<sup>121</sup>.

Additional barriers to treatment include the general lack of awareness within the medical community that obesity is indeed a disease and the popular public belief that obesity is the result of a lifestyle choice<sup>31</sup>.

### **The role of the healthcare professional**

Both the patient and the healthcare provider play a role in the health of the patient<sup>122</sup>. Support from healthcare professionals can help patients achieve clinically significant and maintained weight loss<sup>123</sup>. Patients with obesity may delay visiting a healthcare provider for routine medical care or certain health tests – cervical smears, breast or pelvic examinations – because they feel shame or embarrassment about their weight. These feelings, along with fear of being blamed for their weight problems or hearing hurtful comments, make people living with obesity less likely to initiate a conversation with their healthcare provider about weight loss<sup>122,124</sup>. Because it is difficult for patients to initiate certain conversations, physician-initiated discussions can motivate patients to lose weight and change their behaviour<sup>123,125</sup>.

**To support individuals living with obesity in Bahrain in their efforts to make healthy lifestyle choices, physicians and pharmacists may need further guidance and education on obesity, nutrition and diet<sup>126</sup>.**

It is also crucial to recognise that different groups in society may respond differently to the challenges presented by obesity. Older patients, for example, who may have a greater number of comorbidities, might not necessarily seek support from healthcare professionals for weight loss. However, given the greater prevalence of comorbidities, older patients may require more appropriate, attentive obesity management from healthcare professionals.

## The importance of overcoming weight stigma as a barrier to care

### *What is weight stigma?*

Weight stigma refers to the set of negative attitudes and behaviours – verbal commentaries, subtle insults, teasing or even physical assault – that are directed at an individual based solely on their weight and size.

### *How does it affect the management of obesity?*

Obesity bias or stigma may make a person living with obesity more reluctant to seek care. A non-judgemental, stigma-free environment is necessary for an effective assessment of a patient living with obesity<sup>21</sup>. However, research has found that some healthcare professionals may have negative attitudes towards people with obesity and that they spend less time in a consultation with these patients than their slimmer counterparts<sup>127</sup>.

### *What can be done to avoid weight stigma in a clinical setting?*

There may also be a lack of recognition among healthcare professionals of obesity as a chronic condition requiring long-term management and societal solutions. It will take a holistic approach to address these barriers and challenges in order to improve the medical management of obesity<sup>128</sup>. A positive, supportive dialogue between clinicians and their patients will increase the effectiveness of care.







## A vision of a community free from the burden of avoidable NCDs<sup>16</sup>

The government in Bahrain is aiming to reduce the burden of morbidity, mortality and disability due to NCDs through an effective multisectoral collaboration at national level, to reach the highest attainable standards of health and productivity in all age group categories, in order to achieve well-being, social and economical development and quality of life.

Its strategic approach involves:

**Primary prevention of NCDs** with the goals of halting obesity and lowering the risk of diabetes, increasing levels physical activity, reducing smoking, and salt and fat intake, and increasing vegetable consumption among the population. This is to be achieved by:

- Raising awareness about the risk factors for NCDs
- Promoting healthy nutrition and physical activity among different groups in society
- Establishing legislation and policies to reduce risk factors.

**Secondary prevention**, entailing the early detection of disease and risk factors among high-risk groups.

**Improving the quality of the health services** provided for patients with NCDs and their complications.

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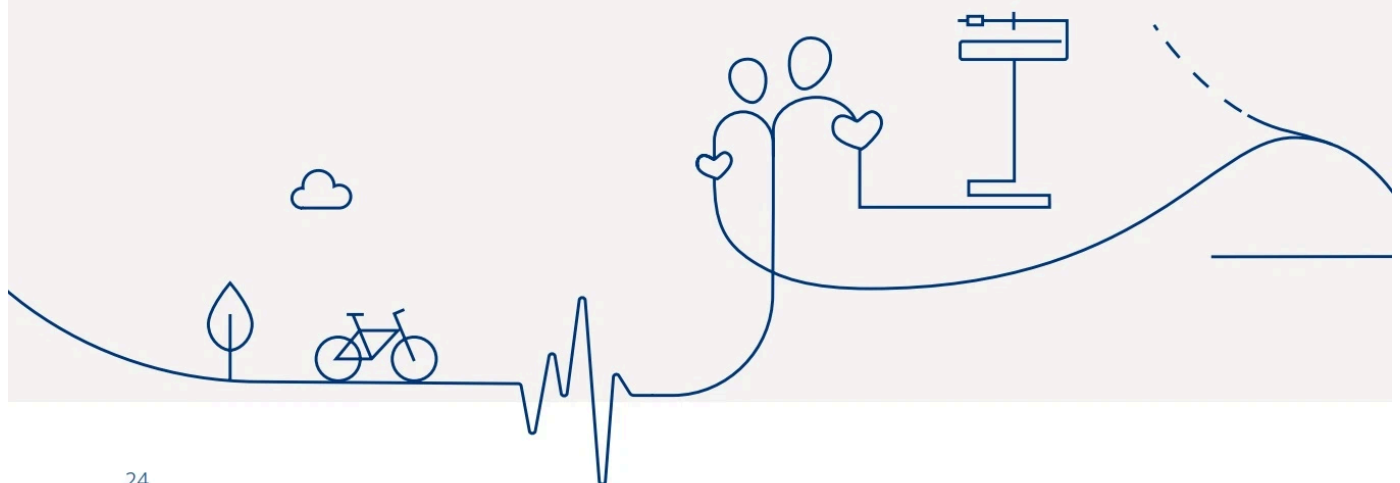
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# Glossary

**Adipose tissue** – another term for fatty tissue; it stores energy, and insulates and cushions the body.

**Arrhythmia** – abnormal heart rhythm.

**Bariatric surgery** – promotes weight loss by changing the digestive system's anatomy, limiting the amount of food that can be eaten and digested.

**Body mass index (BMI)** – a formula for determining obesity, whereby an individual's weight in kilograms is divided by the square of the individual's height in metres.

**Cardiovascular disease (CVD)** – any disease of the heart or blood vessels.

**Comorbidities** – the presence of two or more coexisting medical conditions or disease processes in addition to the initially diagnosed illness.

**Coronary artery disease (CAD)** – narrowing or blockage of the arteries and vessels that provide oxygen and nutrients to the heart. It is caused by an accumulation of fatty material on the inner linings of arteries. The resulting blockage restricts blood flow to the heart. When the blood flow is completely cut off, the result is a heart attack.

**Dyslipidaemia** – any disorder of lipid metabolism reflected in the blood or cholesterol or triglycerides (fats).

**Hypertension** – also known as high blood pressure. Hypertension is serious because people with the condition have a higher risk for heart disease and other medical problems.

**Osteoarthritis** – a chronic disease, also called degenerative joint disease, characterised by progressive degeneration of the cartilage of the joints, occurring mainly in older people.

**Non-communicable disease** or NCD – a non-infectious disease that cannot be passed from person to person. NCDs are also known as chronic conditions and tend to be of long duration. They are usually the result of a combination of genetic, physiological, environmental and behavioural factors.

**Stroke** – also called a cerebrovascular accident (CVA). A stroke is a serious life-threatening event that occurs when blood flow to an area of the brain is cut off. When this happens, oxygen-deprived brain cells begin to die, and the person affected needs urgent treatment.

**Type 2 diabetes** – a progressive condition characterised by high blood glucose levels caused by either a lack of insulin or the body's inability to use insulin efficiently.

## Obesity in Bahrain

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