Maternal and Child Health Nurse
BMI education resource

Section 1: The importance of BMI

Print version
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Section 1: The importance of BMI

Overweight and obesity have dramatically increased across all age groups, including preschool aged children. In 2003, the Australian National Health and Medical Research Council (NHMRC) released guidelines on children's BMI. These make it possible to classify healthy weight and overweight in children from the age of 2 upwards.

The areas addressed in this section are:
- Prevalence of overweight and obesity and the associated health and social risks.
- An introduction to BMI, outlining how to calculate it, the importance of BMI and its limitations.

Did you know?
- Based on a survey completed by 175 Maternal and Child Health Nurses in February 2006, 83% of these practitioners reported they did not calculate BMI in their clinical practice.

Why weight is important!

- Having a healthy body weight is important to all people, and especially children, to optimise their health outcomes.
- Overweight and obesity are associated with greater health risks, even in young children.
- Low weight is occasionally an indicator for poor health or sickness. However, most “thin” children are healthy. In general, being overweight/obese poses a greater threat to long-term health than being “underweight”.
- Being a healthy weight helps children have a better self-esteem and confidence, improves participation in sport and active play and improves sleep.

Health professionals can play an important role in helping to promote a healthy weight in children.

The CD ROM contains a video clip showing Kay Gibbons, a senior dietitian at the Royal Children's Hospital, Melbourne, explaining the importance of managing childhood overweight and obesity to a parent.

To view this video clip, go to the “Resources” section of the CD ROM, click on the Video button and then click the video link title “Importance of managing childhood overweight and obesity”.

Take a moment – reflect
- During your interactions with parents, do you currently promote the importance of a healthy weight in young children?
Health and social risks
Overweight and obesity strictly mean having an excess of adipose tissue (body fat). We need a certain amount of body fat for the normal, healthy functioning of the body. However, an excess of body fat is detrimental to our health.

Childhood overweight and obesity can have immediate effects, though most young overweight children seem healthy. Traditionally it was thought that young overweight children would “grow out of it” or that it was just “puppy fat”, but this is not now generally the case. Unless weight is managed effectively, we know that most overweight children become overweight adults, and this can result in long term health problems.

The following table summarises some of the short and long term health and social risks that have been found to result from overweight and obesity.

<table>
<thead>
<tr>
<th>Obesity problems during childhood</th>
<th>Social factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health</strong></td>
<td><strong>Social factors</strong></td>
</tr>
<tr>
<td>• High blood fat levels</td>
<td>• Decreased self esteem</td>
</tr>
<tr>
<td>• Increased blood pressure</td>
<td>• Decreased quality of life</td>
</tr>
<tr>
<td>• Insulin resistance</td>
<td>• Social marginalisation</td>
</tr>
<tr>
<td>• Impaired glucose tolerance</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long term health risks if childhood overweight and obesity persists through to adulthood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased risk of:</td>
</tr>
<tr>
<td>• Diabetes</td>
</tr>
<tr>
<td>• Coronary heart disease</td>
</tr>
<tr>
<td>• Stroke</td>
</tr>
<tr>
<td>• Osteoarthritis</td>
</tr>
<tr>
<td>• High blood pressure</td>
</tr>
<tr>
<td>• Non-alcoholic fatty liver disease</td>
</tr>
<tr>
<td>• Some cancers (e.g. breast, colon, prostate)</td>
</tr>
<tr>
<td>• Infertility</td>
</tr>
<tr>
<td>• Social and employment problems</td>
</tr>
</tbody>
</table>

Take a moment – reflect
Do you think that a parent thinks about the:
• Health risks for their own child in the short term?
• Health risks for their own child in the long term?
• Social impact on their own child?
Childhood overweight statistics

Childhood overweight and obesity are increasing in prevalence every year. In 2004, 15% of Australian 4-5 year olds could be classified as being overweight and 6% obese (The Longitudinal Study of Australian Children, Annual Report, 2004). Victoria is very close to this national average.

These numbers have more than doubled in the past 10 years. In older children, obesity rates are currently rising by about 1.5% every year. So far, overweight and obesity have affected advantaged and disadvantaged children fairly equally. Evidence suggests that the rise in obesity from now on may be greater among disadvantaged children.

Take a moment – reflect

- Does an awareness of the increase in overweight make you want to do something about it?
- Do you think that we are good at identifying children as overweight / obese, or are we becoming more used to children of this size?

Terminology for overweight

A wide variety of terms and phrases are used to describe overweight. Internationally there tends always to be two categories describing overweight status. The most widely accepted and recognised clinical terms are “overweight” and “obese”. The term “overweight” is self explanatory, whilst the term “obese” is used when someone is very overweight. There are clear criteria to determine whether an individual is overweight or obese and these terms should only be used after applying these criteria.

In Australia and many other countries worldwide “overweight” and “obese” are the accepted clinical classifications for children. In the USA, overweight children are classified as “at risk of overweight” and obese children as “overweight.” The International Obesity Task Force (IOTF) has developed a new approach to defining childhood overweight and obesity to make it consistent with the adult definition (Cole et al, BMJ 2000). However, it takes time for these definitions to become fully integrated worldwide.

As well as clinical terms, numerous colloquial terms describe overweight. Some of these are more acceptable than others. Clinical and colloquial terms that parents may find more or less acceptable are discussed in Section 5: How to discuss BMI with parents.
Take a moment – reflect
- Have you previously used the word obese when talking to a parent?
  - If yes, what was their reaction?
  - If yes, did you use it only for the most obese child/children?
- What are some of the problems that may be associated with giving a child the label “obese”?

An understanding of BMI

What is BMI?
BMI stands for Body Mass Index, which represents a relationship between height and weight.

The BMI is calculated by dividing the weight in kilograms by the height in metres squared.

\[ \text{BMI (kg/m}^2\) = \frac{\text{Weight (kg)}}{\text{Height (m)}^2} \]

The BMI is currently the easiest and most commonly used measure of overweight and obesity. It relies upon accurate weight and height measurements.

Did you know?
Based on a survey completed by 175 Maternal and Child Health Nurses in February 2006:
- 62% of the respondents said they didn’t know the formula for BMI.
- 22% of the respondents could supply the correct formula.
- 16% of the respondents supplied an incorrect formula.
What does the BMI mean?
The BMI is a “surrogate” marker of adiposity. This means that BMI provides an indication of the amount of body fat, but it is not a direct measure of body fatness.

The significance of knowing about the amount of body fat is related to understanding the long-term health risks.

In adults there are clear BMI ranges which indicate amount of body fat and its associated health risks.

<table>
<thead>
<tr>
<th>BMI ranges</th>
<th>Weight status category</th>
<th>Indication of the amount of body fat</th>
<th>Level of health risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 18.5</td>
<td>Underweight</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>18.5 – 25</td>
<td>Healthy weight</td>
<td>Just right</td>
<td>Lowest</td>
</tr>
<tr>
<td>25 – 30</td>
<td>Overweight</td>
<td>Raised</td>
<td>Increased</td>
</tr>
<tr>
<td>30 – 40</td>
<td>Obese</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Above 40</td>
<td>Very obese</td>
<td>Very high</td>
<td>Very high</td>
</tr>
</tbody>
</table>

It is important to note the “BMI cut-off points” for adults are different from children. In children the BMI cut off points are also linked to later health risks, though not so clearly.

BMI in children
The BMI provides an indication of the correct weight for height, based on the relationship between BMI, body fat and health risk. Body composition changes throughout life, with the greatest change being in childhood. This is partly because normal growth increases the weight of all tissues such as bones, muscles, blood and fat. Also, the amount of body fat required for optimum health changes with age and between sexes. This means that the cut-offs defining healthy weight and overweight for children change with age, as the child grows. This is why it is best to plot children’s BMI on percentile charts.

In recent years, gender specific BMI charts have been developed for children. The BMI charts for children take into account the changes that naturally occur in body composition during childhood, but still have ranges that indicate a healthy or less healthy weight. The ranges given for children aim to mirror the categories and health risks represented by the adult BMI cut-off points. To understand if a child is overweight or obese, the BMI figure needs to be plotted on the appropriate BMI percentile chart.

<table>
<thead>
<tr>
<th>BMI Percentile range</th>
<th>Weight status category</th>
<th>Amount of body fat</th>
<th>Level of future health risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than the 5th percentile</td>
<td>Healthy weight / Underweight</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>5th percentile up to the 85th percentile</td>
<td>Healthy weight</td>
<td>Just right</td>
<td>Lowest</td>
</tr>
<tr>
<td>85th to less than the 95th percentile</td>
<td>Overweight</td>
<td>Raised</td>
<td>Raised</td>
</tr>
<tr>
<td>Equal to or greater than the 95th percentile</td>
<td>Obese</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Information on how to use BMI charts for children is provided in Section 3: Calculating and plotting BMI. You can also see examples of BMI percentile charts on page 21.
Limitations of BMI for young children
The BMI does not actually calculate body fat or measure body composition. Therefore, it is possible to misclassify individual children. For example, a very muscular or heavy-boned (stocky) child might have a BMI that suggests overweight, when in actual fact their body fat levels are correct for optimal health. This may be the case for many Polynesian children. Conversely, light-boned children may carry excess body fat but still fall in the “healthy weight” category. This may be the case for children of Asian or Indian subcontinent descent. Misclassification does not happen frequently, and is more likely to occur as a result of weighing and measuring errors. However, measuring and responding to BMI sometimes requires clinical judgement.

Children go through various growth spurts, which tend to happen at relatively defined ages. On an individual basis, a child may get taller before “filling out” or get heavier before they grow tall. If an individual BMI is calculated, varying growth spurts can make interpretation difficult. Ideally, serial BMI measurements are more useful, although this is not always possible.

Despite these limitations, BMI is a well-validated and very useful tool to help identify children’s weight status. Regarding weight, BMI is the best tool we can use currently in clinical practice. The National Health and Medical Research Council (NHMRC) recommends that measuring BMI should become part of routine monitoring for all children.

Why calculate BMI?
It has been shown that assessing by eye is a very unreliable way to determine whether or not a child is overweight. The BMI provides concrete evidence to health professionals and parents of a child’s weight status.

If you have an internet connection, visit the link below to the American Centre for Disease Control and Prevention (CDC) website. This website shows how difficult it is to judge whether a child is overweight or obese.

It is even more difficult to judge a child’s weight category if they are fully dressed. In addition, you may be surprised at the seemingly “normal” size of the overweight and even the obese children, who might not particularly stand out in a group of similar aged children.


Note: The Australian classification for obese, overweight or normal healthy weight varies slightly from the American classification. By the Australian classifications:

- Child 1 on the CDD website would be obese,
- Child 2 on the CDD website normal or healthy weight, and
- Child 3 on the CDD website would be overweight.

It is essential to measure and plot the BMI to gain an accurate assessment of a child’s weight status. A single BMI measurement provides an indication of the child’s weight status at that time point, whereas serial measurements provide information on the changes in weight status over time. Serial measurements are preferable, but not always possible.