The Implications of Over and Under-Nutrition in Hospital

The problems of excessive weight, at one extreme, and of underweight at the other (the two sides of the malnutrition coin), are becoming more and more common. We, as nurses, being at the patient’s bedside for most of the time are the first to notice certain upcoming problems and are the first professionals to be addressed by the patients. We are also the patients’ advocates and the patients’ point of reference to and from other professionals.

Definitions

First of all, how are under or over-nutrition measured and defined? Under-weight results when a person’s calorific intake is lower than his/her metabolic demands for energy. Conversely over-weight results when a person’s calorific intake exceeds his/her metabolic demands for energy. Nowadays the trend is to use the Body Mass Index (BMI) as an indicator. It is a ratio based on weight and height of a person, and is calculated by dividing weight (in kilograms) by height squared (in metres). The ratio indicates the following:

<table>
<thead>
<tr>
<th>Body Mass Index</th>
<th>Lower Limit (kg/m²)</th>
<th>Higher Limit (kg/m²)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>Up to 19</td>
<td>---</td>
<td>Underweight</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>30</td>
<td>Overweight</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>35</td>
<td>Obese</td>
<td></td>
</tr>
<tr>
<td>35 and over</td>
<td>---</td>
<td>Very obese</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 – Body Mass Index.

These help the nurses to make a nursing diagnosis of a patient on his admission to hospital. When a patient is admitted to our hospital, the nurse is the first point of contact. If an elderly person is debilitated, with muscle wastage, shrunken eyes, dehydration and other signs of under-nutrition and dehydration, the nurse is the most adequate person to refer this to the doctors caring for the patient. This patient can be started on some kind of enteral nutrition by means of oral supplementation, or nasogastric tube feeding if necessary. An intravenous infusion may be necessary during the first days in hospital to restore the patient’s hydration.

On the other side of the coin, a patient may be admitted obese or overweight. He may be diabetic or have a high cholesterol level. This patient should also be referred (with the patient’s consent) to a dietitian (or a hospital nutritionist, if present) for weight reduction. This can take the form of a specific diet and/or of medication, such as is used to control raised blood cholesterol levels.

Under-Nutrition in hospital


- Difficulties with chewing, swallowing, digesting food, pain, nausea and lack of appetite.
- Nutrient loss can be accelerated by bleeding, diarrhoea, malabsorption disorders and other factors.
- Fever, infection, surgery, trauma, burns and some medications and benign or malignant tumours increase the amount of nutrients needed by patients.
- Severe sepsis, inflammatory disease and surgery switch on inflammatory mediators whose job is to mobilise muscle tissue to provide amino acids for an effective acute-phase response.

Numerous research studies have also documented the inability of many health care providers to identify nutritional deficit vulnerability and early and advanced under-nutrition (Ennis et al., 2001).
The consequences of malnutrition are:

- Reduced renal function
- Impaired wound healing
- Constipation, diarrhoea, pain
- Respiratory failure
- Skeletal muscle atrophy
- Increased length of stay
- Surgery stress, increased metabolic rate
- Reddish hair, atrophy of tongue papillae

Under-nutrition may be treated by enteral nutritional methods – oral supplementation, nasogastric or nasojejunal feeding, gastrostomy tube feeding (percutaneous endoscopic (P.E.G.) or surgical), or parenteral nutrition.

**Over-Nutrition in Hospital**

Experts agree obesity is rapidly rising in the Western World – at least 1/3 of Americans are obese. It is increasing in all ages, sexes, races with women and non-whites being the worst. Some percentages of obesity in people around the world (W.H.O., 2004) are:

- Western Europe: 10-25%
- U.S.: 20-30%
- Eastern Europe, Mediterranean, U.S. Afro-American Women: 40%
- Highest in the World: Melanesians, Micronesians, Polynesians (Island of Nauru: 70% or women and 65% of men).

The key to the problem lies in evermore widespread sedentary lifestyle and a diet over-rich in calories and fats, snacks, excessive TV viewing and short sleep duration. Children are not exempt. 1 out of every 4 children are obese, the main cause being that the metabolic rate of children 8-12 years of age, while watching TV, is lower than with children just doing nothing or resting.

The implications of obesity are:

- Insulin Resistance
- Diabetes Type II
- Hypertension
- Dyslipidemia
- Coronary Heart Disease
- Gout
- Osteoarthritis
- Gall Bladder Disease & Stones
- Cancers of Bowel, Breast, GU Tract
- Skin Diseases (especially fungal diseases)
- Sleep Apnea with chronic hypoxia.

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>Pre-menopause</th>
<th>Post-menopause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk</td>
<td>Risk</td>
</tr>
<tr>
<td>Thin</td>
<td>1x</td>
<td>1x</td>
</tr>
<tr>
<td>Overweight</td>
<td>2x</td>
<td>5x</td>
</tr>
<tr>
<td>Obese</td>
<td>3x</td>
<td>12x</td>
</tr>
</tbody>
</table>

Table 2 – Increase in breast cancer risk due to obesity.
Above average body weight

Figure 1 – Increased risk of death from cancer and obesity.

Psychological & social issues related to obesity are:
- Low self-esteem
- Increase in depression
- Difficulties in getting and holding a job
- Tendency towards social isolation
- Decreased attractiveness for the opposite sex.

Implications for healthcare workers

Healthcare workers need to know how to recognise under and over-nutrition. The nurses’ role is crucial in order to prevent the patients from suffering from the complications that may arise as a result of malnutrition (in its broad sense). Nurses act as catalysts that go between the patients and other healthcare workers. These, in turn, can do their utmost to treat the causative factors that precipitate malnutrition, ideally by formulating strategies that prevent the potential factors from becoming a reality. The government also has a role to play in this. Strategies can be formulated on an organizational or a national level, i.e. by companies, hospitals or entities, to prevent malnutrition. Schools are the first line of action towards preventing obesity. In the USA at present, former president Bill Clinton is one of the main participants in a campaign to fight childhood obesity. By educating our parents and their children we can fight the problem of malnutrition – incorrect nutrition within our Maltese population. We must create strategies to prevent under-nutrition, especially in our elderly population and find ways of diagnosing it as early as possible in our community setting. At the same time we must plan a strong framework that deals with this problem both in our hospitals and outside. We are the links and the key to all this! Let us put our efforts into this mission for our future and the future of our parents and offspring.