Abstract.

Obesity is when a person is carrying too much body fat for his or her height and sex. A person is considered obese if he or she has a Body Mass Index (BMI) that is 30 or more. Obesity can happen when a person eats more calories than is burnt off over a period of time. Medical researches have associated some health risk factors with individual’s body mass index (BMI). Obesity is a major risk factor for diseases of the cardiovascular system, this include coronary heart disease such as hypertension, congestive heart failure, high levels of blood lipids, atherosclerosis, strokes, osteoarthritis and varicose veins. The rate at which calories from food and drink are burnt off is referred to as metabolic rate. This is often faster during growth spurts and puberty, but reaches a fairly steady rate by adulthood. Metabolic rate can be increased if the individual engages in active physical exercise. People who are very active generally have a higher metabolic rate than those who are inactive because they burn off calories faster through energetic activities. If the amount of calories provided by the daily food intake is more than the calories that is burnt off, the body will store the extra energy as fat leading to overweight and obesity.

Introduction.

Obesity has been defined with different terms but it is essentially a bodily condition marked with excessive deposition and storage of fat (Amosun, 1994). Obesity characterized by an excess accumulation of fat is detrimental to good health and well-being. Over half of the fat in the body is deposited under the skin (Pi-Sunyer, 1998). About 11% of body weight in men and 18% in women is subcutaneous fat. Some researchers have suggested that using the sum of skinfolds from different areas will better reflect total body fat (Durnin and Womersley, 1984).

Obesity has been linked with various health disorders. Studies have been carried out to establish the beneficial effects of exercise and weight reduction on alleviating some of these health disorders (Bouliame, Hunter, viel, Physick-Sheard and Julian, 1993; Swan and Howley, 1994). Obesity is a health hazard in most developed countries of the world. Obesity is defined as a chronic disease characterized by an excessively high amount of body fat in relation to lean body mass (Hoeger and Hoeger, 1999). McGlynn (1999) defined it as the condition of a man who has over 20 percent body fat, or of a woman who has over 30 percent body fat. It is also defined as the above average amount of fat contained in the body. The average amount depends upon the lipid content of each fat cell and on the total number of fat cells (Fox and Mathews, 1981). Fat (adiposities) probably increase in number.
from childhood up to adolescence. Lack of exercise, coupled with overeating, has been implicated in the formation of such adiposities (Tipton, 1999).

Obesity can result from any one factor or a combination of many factors. It has been linked to both physiological and psychological trauma, hormonal imbalance and alterations in homeostatic balance. Environmental factors such as cultural habits, inadequate physical activity and improper diets all contribute to excessive weight gain (McGlynn, 1999). Obesity is a major risk factor for diseases of the cardiovascular system, this include coronary heart disease such as hypertension, congestive heart failure, high levels of blood lipids, atherosclerosis, strokes, osteoarthritis and varicose veins (http://www.americanheart.org). Recent research has also identified a possible link between obesity and cancer of the colon, rectum, the prostate, gall bladder, breast, uterus and ovaries (Hoeger and Hoeger, 1999; McArdle, Katch and Katch, 2000). People who are obese are also at social and economic disadvantage. Hockey, (1993) reported that the obese have to pay higher insurance premiums because of their inherent reduced life expectancy.

Weight control.

Obesity is an extremely difficult problem to solve. Its solution takes realistic goal setting, patience, counseling and positive reinforcement (http://www.cdc.gov/nchs/products/pubs/pubd/obese/obses99htm). Realistic goal setting involves evaluation of the body composition, setting a target body weight, short-term and long-term goals. Target body weight means the amount of weight to be lost in a week or in a year. Factors such as enthusiasm, maturation, mental state, eating habits/patterns and socialization must be considered when treating obesity (McGlynn, 1999). According to Hockey (1993), the balance between food intake and energy expenditure is very important in weight control. McArdle, Katch and Katch (1996) also stated that if the total caloric intake ingested as food exceeds the daily energy expenditure, the excess calories will be stored as lipid in the adipose tissue.

Energy balance and weight control

A person is said to be in a state of energy balance when he or she is able to maintain a constant weight (Prentice, 1999). That is, the number of calories consumed in food equals the number used in the three energy requiring processes which are basal metabolism, physical activity, and thermic effect of food. Under this condition, the bodyweight should remain constant and should neither increase nor decrease by any appreciable amount (Hockey, 1993). A positive energy balance exists when the caloric intake is greater than caloric expenditure. The extra calories will be stored and the person gains weight (Fox and Mathews, 1981).

There are three ways to unbalance the energy balance in the direction of weight loss. This is referred to as negative energy balance.
1. Reduced caloric intake in such a way that it will be below the daily energy requirements.
2. Maintain normal caloric intake and increase energy expenditure through additional physical activity above the daily routine of activities.
3. Combine both methods by decreasing daily caloric intake and increasing daily energy expenditure (McArdle, Katch and Katch, 1999; Wilmore and Costill, 2005).

Dieting for weight control.
A reduction of the caloric intake below the daily energy requirement (i.e. dieting) has some inherent problems.

1. The weight supposedly is often regained and people may end up heavier after dieting than when they began to diet. This is because a reduction in caloric intake slows down metabolism, which is counterproductive to losing weight. The body has a built-in mechanism that drives the body to maintain a certain amount of body fat and when caloric intake is restricted, the body will attempt to compensate by “slowing down” metabolic processes to conserve the amount of body fat that is present (Hockey, 1993). This protective ‘slow down’ in resting metabolism will last as long as the person is on diet and may even remain low even after, thus making continuous weight loss difficult, if not impossible (McGlynn, 1999).

2. Weight loss on a low caloric diet is usually from muscle tissue and the less muscle tissue in the body, the lower the metabolic rate (McGlynn, 1999).

3. Dieting usually results in depression. For many people dieting is an anti-social event. They give up friends and meals and stop attending social functions so as not to overeat. This usually results in depression and anxiety which in turn sets the stage for overeating as the affected individual may turn back to food for comfort (Hockey.1993).

4. Most diets do not encourage behavioral modification. The variety of methods of dieting may produce significant weight loss. Sustained weight loss requires changes in diet and lifestyle which can be stressful at first because it disrupts old patterns and habits. However, in the long term, it is easier to maintain adherence to big changes because such changes take the individual out of his or her old habits and help the individual to form new ones.

A comprehensive programme for weight control recommends a diet that includes bean, legumes, fruits, grains and vegetables. Efforts must be made to avoid the following foods as much as possible - all oils, nuts, seeds, high-fat or low fat dairy products, meats (including chicken and fish) and simple sugar derivatives (McGlynn, 1999).

**Exercise for weight control.**

Exercise is an integral part of any weight loss programme but losing weight through exercise takes time just as it takes many years to put on a lot of extra weight (McGlynn, 1999). The effectiveness of regular exercise in achieving weight loss is linked to one's degree of obesity. Generally, persons who are obese lose weight and fat more readily with exercise than their counterparts of normal weight. When exercise is used for weight loss, factors such as frequency, intensity, duration and the specific form of exercise must be considered. Continuous, big muscle, aerobic activities having moderate to high caloric cost such as walking, running, rope skipping, stair stepping, cycling and swimming are ideal. Many recreational sports and games are also effective in reducing body fat (McArdle, Katch and Katch, 1996; Wilmore and Costill, 2005).

The more vigorous or exhausting the physical activity the greater the number of calories burned per minute. Activities like running and cross country skiing probably burn up the highest number of calories – up to 20 calories per minute. Swimming is also rated very high in caloric expenditure (McGlynn, 1999).

Exercise has the following effects on the body.

1. Aerobic exercise decreases percent body fat.
2. Cycling, running, and walking are equally effective in altering body composition.
3. Exercising three to four times a week produces significant changes in body composition.

4. Low-intensity aerobic exercise is better than high-intensity exercise for promoting fat loss.

5. High intensity (heavy weights with low repetitions) resistance training is effective in decreasing percentage body fat and increasing lean body mass (Prentice, 1999). A successful exercise programme requires commitment, and must be done on a regular basis to achieve specific objectives.

**Dieting and exercise for weight control.**

Exercise in combination with mild dietary restriction can be used to effectively unbalance the energy balance equation in the direction of weight loss. This combined approach is less likely to induce the feelings of intense hunger and psychological stress that occur when weight loss is attempted using caloric restriction exclusively. It also provides unique and significant health related benefits, and contributes to the long-term success of weight loss effort (McArdle, Katch and Katch, 1996). Weight loss without exercising can have a negative effect on body composition. Frequent intermittent dieting, alternating with weight gain, in the absence of exercise will result in a loss of lean body tissue and an increase in body fat content (Robins, Powers, and Burgess, 1999; McGlynn, 1999).

**Measurement of Body Fat**

The body mass index (BMI) is a good estimate of how much of the body is made up of fat. It relates the body weight to height. BMI can be calculated by dividing the weight (in kilograms) by the square of the height (in metres) (Siri, 1988; McArdle, Katch and Katch 2000). For example, if an individual weighs 70 kg and he is 1.75 metres tall, the BMI is calculated as follows:- $\frac{70}{1.75 \times 1.75} = 22.9$. Medical researches had associated some health risk factors with the individual’s BMI. ([http://www.americanheart.org](http://www.americanheart.org)).

<table>
<thead>
<tr>
<th>BMI</th>
<th>Classed As</th>
<th>Health Risk</th>
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<tbody>
<tr>
<td>Less than 18.5</td>
<td>Underweight</td>
<td>Some health risk</td>
</tr>
<tr>
<td>18.5 to 24.9</td>
<td>Ideal</td>
<td>Normal</td>
</tr>
<tr>
<td>25 to 29.9</td>
<td>Overweight</td>
<td>Moderate health risk</td>
</tr>
<tr>
<td>30 to 39.9</td>
<td>Obese</td>
<td>High health risk</td>
</tr>
<tr>
<td>40 and over</td>
<td>Very obese</td>
<td>Very high health risk</td>
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</table>

(McArdle, Katch and Katch 2000).

In addition, there is an increased health risk when the extra fat is mainly around the waist ('apple shaped'), rather than mainly on the hips and thighs ('pear shaped'). As a rule, a waist measurement of 102 cm or above for men and 88 cm or above for women is considered a significant health risk. In short, the heavier an individual is, the longer he is carrying the extra weight, and the more the fat is around the waist, the greater the individual’s health risk (Robins, Powers, and Burgess, 1999).
Guidelines for weight control.
1. Eat a nutritious breakfast within an hour of waking up. This raises the body's metabolism and makes energy available for the body. It also helps to control the cravings for snacks throughout the day.
2. Eat at least three planned meals spaced regularly throughout the day. This increase metabolism and more calories will be used up. Skipping meals or long lapses between meals can distort the feeling of hunger, which can make one to eat more calories than is needed at a time leading to an increase in the amount of stored fat in the body.
3. Evening meal should be taken as early as possible.
4. Drink water frequently throughout the day. This is necessary to maintain a normal fluid balance and for the body to metabolize fat efficiently.
5. Limit alcoholic beverages intake. Alcohol provides a considerable number of calories with no nutritional value. These calories are referred to as “empty calories”. Therefore, it is important that even moderate drinkers need to drink less if they are overweight or have excess fat.
6. Limit between meal snacks to low calorie, non-fat or low fat food.
7. Limit the intake of simple refined sugar.
8. Limit intake of sodium or salt. Excessive intake of sodium or salt is likely to create an imbalance in fluid balance and contribute to an increase in blood pressure (McArdle, Katch and Katch 2000).
9. Cut down on the amount of fat taken per day. Fat provides more than twice as many calories as protein or carbohydrate, and those people who eat more fat accumulate more fat in specific areas of the body.
10. Increase intake of dietary fibers such as vegetables and fruits.
11. Exercise regularly: Regular aerobic exercise is important. One needs to make a commitment to exercise continuously for at least 45minutes for a minimum of 5 days each week in any type of weight bearing activities such as walking, jogging, stair climbing and rope skipping. The performer should start out at a very low level until 45minutes of continuous work as comfortably as possible and then gradually increase the intensity as adaptation to exercise is being developed (McArdle, Katch and Katch 2000; Wilmore and Costill, 2005).

Conclusion.
Obese people or those who are overweight, have an increased risk of developing various health problems. A realistic aim for many people is to lose 5-10% of weight over three months. This is often about 5-10 kg (10 kg is about one and a half stone). Weight management and reduction through participation in physical exercises will greatly reduce the incidence of health risks. The best chance of losing weight, and keeping the weight off, is to be committed to a change in lifestyle. This includes eating a healthy diet and doing some regular physical activities.

REFERENCES.

Centers For Disease Control. Center For Health Statistics [2001].
Centers For Disease Control. Center For Health Statistics [2001].


