



## Sustainable Prevention and Management of Excessive Weight in Overweight and Obese Population

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### Abstract

This review defines overweight, obesity, weight loss and discusses conditions required to achieve effective and sustainable healthy weight. Body mass index was used as a critical tool in determining the need to lose weight as being overweight or obese are valid reasons to lose weight. Overweight and Obesity conditions relevance to health were highlighted. Dietary and non dietary approach to losing weight sustainably and healthily were also enumerated in the chapter. World Health Organization reports of 1998, 2003, 2015 and 2018 constituted the scientific basis of losing weight and maintaining healthy weight and its significance to health especially as overweight and obesity conditions are implicated in the development of Diabetes, Cardiovascular diseases and some types of cancer in humans. Consequently future research and development efforts should be geared towards developing novel food products such as healthy beverage, snacks and meal from available food crops in each country globally to prevent excessive weight gain that could lead to becoming overweight or obese and thus limiting the need to having to lose weight. There must be a food policy in place that is in favor of production of health based food products. There should be nutrition program to create awareness about the health implication of being overweight or obese, regular exercises/physical exercises should also be encouraged through various media for maximum impact among the populace.

**Keywords:** Overweight; Obesity; Weight Loss; Sustainable; Dietary; Non Dietary; Research

### What is weight loss?

Weight loss occurs when energy expended is greater than energy intake. Weight loss maintenance according to Wing and Hill [1] is the deliberate act of losing about 10% of body weight and sustaining it for about 1 year.

In order to lose weight there should be less energy intake and burning up more energy. This means that the food intake needs to be reduced and the level of physical activities must increase significantly. It has been shown that losing weight steadily and gradually is the safest way of losing weight and the weight is much more likely to stay off than if you lose it quickly.

The Body Mass Index is a useful measure but it is only a guide as it has been found to have limitations especially suitable only for adults above 18years old, not useful for pregnant women and professional adult athletes and that BMI values differ slightly with gender and race.

### Body mass index

Body Mass Index (BMI) – It is generally calculated as the ratio of weight and height.

$$\text{BMI} = \text{weight (kg)} / \text{height}^2 (\text{m}^2)$$

### Overweight and obesity

They are both defined as abnormal or excessive fat accumulation that presents a risk to health. Overweight and obesity are major risk factors for a number of chronic diseases such as Diabetes, cardio vascular diseases and cancer [2]. Excess abdominal fat has been reported to be as great a risk factor for disease as is excess body fat [3].

Obesity has reached epidemic proportions globally with more than 1 billion adults overweight with at least 300 million of them clinically obese and is a major contribution to the global burden of chronic disease and disability [3].

Obesity is a complex problem in developing countries often co existing with undernutrition with serious social and psychological dimensions affecting virtually all age groups.

Increased consumption of energy dense nutrient poor foods with high levels of sugar and saturated fats combined with little or low physical activity are major contributions to overweight and obesity [4].

Obesity can be classified according to the World Health Organization (WHO) as shown in Table 1 below:

Classification of obesity		
	BMI (kg/m <sup>2</sup> )	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5-24.9	Average
Overweight	>25	
Pre-obese	25.0-29.9	Increased
Obese class I	30.0-34.9	Moderate
Obese Class II	35.0-39.9	Severe
Obese Class III	>40.0	Very severe

**Table 1:**

Source: World Health Organization (2000).

A higher BMI ie higher than the normal range given above is associated with the risk of stroke, hypertension, lower high density lipoprotein HDL cholesterol level, high blood pressure and high total cholesterol level [5].

### Why weight Loss?

Weight loss is important for a healthier lifestyle. Weight reduction prevents the risk of diabetes, heart disease and hypertension. Unchecked weight accumulation impairs quality of life and presents several medical conditions. For instance for overweight and obese type 2 diabetes management weight loss is essential for decreased blood pressure, fasting blood glucose concentration decline and improved glycemic control [6].

### Healthy weight loss and methods to achieve weight loss

Weight loss can be achieved by gradually increasing fibre intake which thus reduces cholesterol, enhances healthy bowels and fills the stomach quickly which is therefore beneficial in calorie reduction. Foods rich in fibre should therefore be included in everyday meal in order to achieve healthy weight loss. Fibre rich foods include fruits and vegetables [7].

Protein rich food sources such as beans, fish, cheese, yoghurt and lean meat also aids in healthy weight loss because they exert satiety for a long period of time thus restricting excessive food consumption. Thus slight increase in dietary protein and carbohydrate reduction aids weight loss management [8]. According to Gardner [9], low fat diet was not as effective as low carbohydrate and high protein diet in the control of weight loss amongst individuals, however, it is important to understand that one dietary approach is not sufficient to exclusively judge as the ultimate strategy for weight loss management without consideration of medical predisposition. For instance, an insulin resistant individual will successfully lose weight on a low carbohydrate diet than on a low fat diet. Thus combining other strategies will be more effective in sustaining healthy weight loss such as dieting plus exercise [10,11].

Studies on the consumption of low glycemic index (GI) foods and high protein diet helped in weight loss while a low GI and low protein diet increased weight gain. Low GI foods consumption does not supercede other dietary approach however it is of much benefit to type 2 diabetes patients in weight loss management. Another dietary approach, low carbohydrate diets which include the consumption of nutrient dense carbohydrate such as whole grains and reducing refined carbohydrate. This approach in weight loss management combined with low-fat diets was effective in weight loss management with controlled food and portion size monitoring [12].

High protein diet is beneficial to control appetite, increase energy expenditure, reduces energy intake due to increased satiety and improve body composition. A meta-analysis conducted by Santeso, *et al.* [13] showed that higher protein diet aided weight loss and waist circumference reduction [14]. The protein requirement per individual differs when embarking on weight loss using higher protein intake especially amongst the overweight, obese and elderly people. It is dependent on the weight of the individual and not a generalized requirement. The recommended protein intake per day for men is 64g per day while for women is 45g per day however, a higher protein intake of 1.2-1.6 per kg of body weight per day will be required if weight loss should be achieved in reference to their body weight. In the Australian population, the major sources of protein are derived from dairy products, meats, processed meat, pastries, poultry and bread products however, high protein food sources include chicken, white fish, tofu, eggs, nuts, milk, lean meat, legumes, cheese and tuna. Thus proper distribution of protein in the daily meal will further boost weight management compared to just one particular meal [14]. The total wellbeing diet's new protein balance eating plans recommends at least 25g of protein per meal

with increased protein intake at breakfast which helps to control craving and appetite all through the day and thus increase fat loss [14].

Furthermore, the Dietary approaches to Stop Hypertension (DASH) diet sustained over a period of time showed effective weight loss most especially because the diet involves the consumption of more low-fat dairy, fruits and vegetables, consumption of whole grains and lesser meat intake. American Dietetic Association (ADA) states that achieving a negative energy balance is effective in weight loss management. The DASH diet however, is a veritable approach in achieving a negative energy balance thus its effect on weight loss management. Achieving weight loss will reduce the incidence of diabetes; reduce blood pressure as well as other cardiovascular comorbidities [15].

Consumption of low calorie and low fat diets, eating breakfast regularly, regular eating pattern, regular exercise of about 1 hour per day and weight monitoring were strategies used to maintain weight loss according to Montesi., *et al* [16]. Other strategies include; drinking more water which aids weight loss. Consuming protein foods first helps to achieve satiety faster. Avoid skipping breakfast and other meals to prevent extreme hunger which can lead to poor food choices and binge eating. Avoid empty calorie foods (foods high in sugar, fat and salt but low in nutrients) such as candies, beer, pastries, fried foods and chocolate. Also there is a need to reduce the consumption of foods and drinks high in sugar, fat and salt and eat more fruits and vegetables at least 5 portions of varieties per day. Consume unsaturated oils. Additionally chewing of gum helps to distract one from food cravings temptation. Deep fried foods should be avoided, instead, grilled, baked or steamed meals can be consumed. Also reduction in portion sizes of meals is another effective way to lose weight. Therefore, the amount of food to be consumed should be accessed in comparison to the activity level of individuals. Eating slower can also help to lose weight because the slower an individual eats, the lesser the food consumed because the brain will send signals to the stomach of satiety. Conscious efforts to weigh meals before consumption equally help in healthy weight loss [1,6].

For post-partum weight loss, the consumption of calorie restricted diets helped in weight reduction however, dieting reduces maternal free fat mass while, dieting plus exercise was more effective because it enhances cardiovascular fitness and preserves free fat mass while exercise alone had little effect on free fat mass and weight loss [17].

### Keeping a food diary

Filling out a Food Diary has been found to be very useful in the control of weight management and weight loss. The Food diary will ultimately identify diet changes that need to be done as well as eating patterns that need to be adjusted or corrected.

A typical Food Diary usually contains the days of the week, meal/time of the day it was taken as well as what food/drink that was consumed. It will also have a section on Food groups taken and possible comments about how the consumer feels at the time of having the meal/drink and where the consumer was at the time of eating the meal or having the drink. The advantage of using the Food Diary approach is that a determined individual can easily use it and monitor the outcome of the food diary to his advantage for effective weight management and weight loss. Consequently this approach requires the individual involved in weight management and weight loss to set SMART goals to achieve his overall objective of losing weight using a healthy dietary approach. Skipping meals is however bad for weight loss. A gradual weight loss of 0.5 to 1Kg per week have been found to occur using this approach.

### Portion size

The American National guidelines have recommended that for sustainable weight loss a reduction in calorie intake of about 500-600Kcal per day should be combined with increasing physical activity levels.

To lose weight it has been documented that an average man can eat or drink 1800Kcal a day while the average woman can eat or drink 1500Kcal a day to lose weight. Also it has been recommended that the calorie intake by the individual that wants to lose weight healthily should include all food consumed with drinks and should be based on the food groups from the EATWELL PLATE. Examples of healthy food products include whole grain breakfast cereals such as porridge with low fat milk or yoghurt, toast with boiled, scrambled eggs or with baked beans, tinned tomatoes, edible mushroom, bowl of mixed fresh fruit with Yoghurt etc Water and low fat milk are the best drink choices. Water quenches thirst with no calories.

The World Health Organization [2] has proposed a set of global recommendations on diet for reducing energy imbalance and maintaining a healthy body weight and these recommendations include: sufficient daily consumption of fruits and vegetables (greater than or equal to 400g) and restricted consumption of free sugars (less than or equal to 10% or ideally, less than 5% of total daily energy intake), fat (less than 30% of total daily energy intake from total fats, less than 10% total daily energy intake from saturated fats and salt (less than 5g daily).

### Hunger management in relation to weight loss

There is a need to make time for meal and snacks during the day and the individual interested in losing weight healthily needs to take a break during work and activity so as to prevent skipping meals and snacking on less healthy food products. Food products/meal high in dietary fiber can be chose such as vegetables, fruits, beans and lentils and whole grain products.

### Apetite management

The individual that wants to lose weight should actually be sure that he is hungry and therefore needs to eat. It is not good to eat because of how one feels eg being upset, lonely, bored, stressed or tired. Also try not to eat while watching television or working on computer or while reading as during these period it is easy to overeat as one may not be paying enough attention to the quantity of food consumed.

### Physical activity levels in relation to weight loss

Activity is an important component of a healthy lifestyle.

The individual interested in losing weight have been advised to aim for at least 150minutes of activity each week. Physical activity have been reported to have some health benefit effects such as stronger bones and muscles, less muscle loss during weight loss, being more fit and flexible, better quality of life, lower risk of heart disease and less stress. It has also been suggested that to lose weight and keep it off an individual interested in losing weight may need to be active for more than 250minutes per week [18]. The World Health Organization has however recommended that adults should have a minimum of 150minutes of moderate-intensity or 75minutes of vigorous intensity aerobic physical activity per week and muscle –strengthening activities for at least 2 days per week. For children and young people aged 5 to 17years, the World Health Organization [2] recommends at least 60 minutes of moderate to vigorous intensity physical activity daily.

Individuals are therefore required to choose activities that they like and fit into their schedule such as walking, swimming etc to be physically active daily.

### Traditional methods

The use of natural methods for weight loss management has been adopted because it is cheaper and reliable compared to conventional drugs or surgery. Some of the anti-obesity medicinal remedies include the use of jasmine tea, green tea, oolong tea, ginseng, flax seed, turmeric, garlic, seaweed, chitosan and cinnamon. These traditional medicines were reported to inhibit lipase activ-

ity in the pancreas, decrease appetite and boost lipid metabolism. The use of these traditional remedies constituted some side effects which may be due to the interaction of phytochemicals present in the plants [19].

### Non dietary approach to weight loss

Moderate activities such as swimming, biking, cycling, jogging, calisthenics and brisk walking enhance weight loss especially for those who are overweight and obese. Exercise helps to improve health and wellbeing thus reducing cardiovascular risk [10]. For long term weight loss sustenance about 60 minutes moderate activity like walking and about 35 minutes of vigorous activity is required daily. For less active individuals, physical activity must be introduced gradually for instance 10 minutes daily and then later increased [6].

Bariatric surgery is recommended when other weight loss methods have failed. Bariatric surgery involves three methods, the first is the gastric banding method whereby a silicon band is used on the upper stomach to restrict food intake and reduce the capacity of the stomach thus causing satiety. The second method is the gastric bypass, this procedure involves the division of the upper stomach and joining it to the jejunum thus food bypass the stomach. This method thus limits the stomach size. The third method is the sleeve gastrectomy. After bariatric surgery some precautions must be adhered to for long term management such as consumption of vegetables, avoidance of fluids about 30 minutes before, during and after meals, avoiding the use of straws to prevent air intake, continuous intake of vitamin supplements and avoidance of pregnancy by women for about 18 months [20,21].

Drugs approved by Food and Drug Administration (FDA) for obesity management has been used for weight loss some of such drugs include Orlistat, Liraglutide and Naltrexone-bupropion. The use of these drugs is however based on medical prescription [22]. The use of supplements has been adapted for weight loss management. These supplements contain fibres, minerals, herbs and are in form of capsules and liquids. However, the use of supplement is not advisable because of side effects that may arise from its usage.

Lifestyle modifications for weight loss include increased physical activity, calorie restricted diet and improving behavioural skills that will be effective for managing eating and physical activity patterns such as avoiding the use of lifts and using the stairs to enhance fitness [6,23].

## Conclusion

Low calorie diet help in rapid weight loss. It must be done with caution when dealing with patients with health issues in order to prevent the onset of other medical complications. The effects of physical activity and dieting have been investigated as the most recommended method of healthy weight loss. Future research in weight loss involving a dietary approach need to focus more in the areas of development of healthy meals, snacks and beverages that possess not only nutritional properties but can also have some anti obesity properties when ingested for a given period of time without any safety and toxicological concerns for different age categories as well as for pregnant and lactating mothers using indigenous food crops available in each country for possible ease of acceptability of the developed products by the populace and sustainable pilot and commercial production of those food products.

This should then be followed by massive awareness and publicity of such developed food products to the consuming populace as well as the nutrition and health promoting bodies/organizations at local and international levels and different platforms.

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