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Review Article

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Steps toward behavioural weight loss and maintenance: a daily practice

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ABSTRACT

Obesity is an increased fat accumulation to the levels that affect health and wellbeing. Body mass index (BMI) categorizes people as normal, overweight or obese depending on arithmetic equations. Obesity is a global epidemiological problem, affecting more than 30% of the world population. The main hazard is that the obesity prevalence still escalating. Human behavior plays a major role in the causes of obesity. In addition, other factors are also contributing to bodyweight increase such as, genetic, endocrine and metabolic factors. Nevertheless, obesity can be controlled and ideal weight can be achieved. Some measures and practices were suggested in this mini-review through which a one-day human life cycle was set up as a model that can be followed to ensure proper weight and maintain it thereafter. These measures include regular sleep/wake-up pattern, strict timing of meals, practicing exercise, drinking at least 2.5 liters of water and early going to bed. However, the fundamental mechanisms of weight loss and increase were not addressed in this mini-review.

Keywords: Weight loss, Maintenance, Obesity, Overweight

INTRODUCTION

Definition and prevalence

WHO defines obesity as an excessive accumulation of body fat that may affect people's health. This description is based on the BMI. Similarly, according to WHO, BMI is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²) as overweight BMI $\geq\!\!25$ and obesity BMI $\geq\!\!30.^2$

Globally, obesity is considered the most common metabolic ailment with high prevalence. According to WHO, more than one billion people are considered overweight among them more than 30% are obese. This figure gives alarms to governments and health intuitions because of its continuous increase.³ However, the prevalence varies among countries, for instance, 19%,

16%, 5.9%, 0.6% prevalences have been found in the USA, Saudi Arabia, Singapore and Tanzania respectively in years between 1998-2000. This picture may relate the economic status with obesity, the richer the country the higher the prevalence of obesity. However, it seems that food habits may play a role in obesity.⁴

Determinants of the obesity

There are several reasons and factors implicated in obesity as a major health problem worldwide. According to a recent study by Phelan and colleagues, the causes of obesity can be broadly divided into two possible reasons and their contributing factors, which are listed in Table 1.5

The investigators concluded that overeating and lack of exercise were the most contributing factors of obesity among behavioral causes whereas genetic and psychological factors were among non-behavioral factors were showed the highest probabilities of obesity.

Table 1: Causes of obesity.

Metabolism-related consequences	Other complications
Elevated blood pressure	Gall bladder diseases
Cardiovascular diseases (CVD)	Locomotor system and joint problems
Dyslipidemia	Obesity-related kidney disease
Uric acid overproduction	Cancer
Type 2 diabetes	Respiratory diseases and apnea

Table 2: Major health problems consequent obesity.

Human behavior causes	Non-behavioral causes	
Inactive lifestyle	Genetic factors	
High amount intake	Endocrine disorder	
Weak willpower	Psychological factors	
Lack of nutritional awareness	Food craving	
High-fat food	M-4-1-1:- 1:-4	
Frequent eating	Metabolic disturbance	

Risk and health consequences of obesity

The importance of obesity emerges from its effects on almost all organs and tissues including the brain. Table 2 summarizes the major health problems consequent obesity.³

From the above-mentioned report, obesity can lead to life-threatening diseases such as cancer and CVD. In addition, all other complications may affect the quality of human life. Therefore, this mini-review focused on the possible ways for reducing and maintaining body weight.

DISCUSSION

Steps toward bodyweight reduction

A 24-hour life cycle of a human can be considered as a model to show step-by-step what should be done to achieve proper body weight and maintain it. One-day model practice illustration (Figure 1).

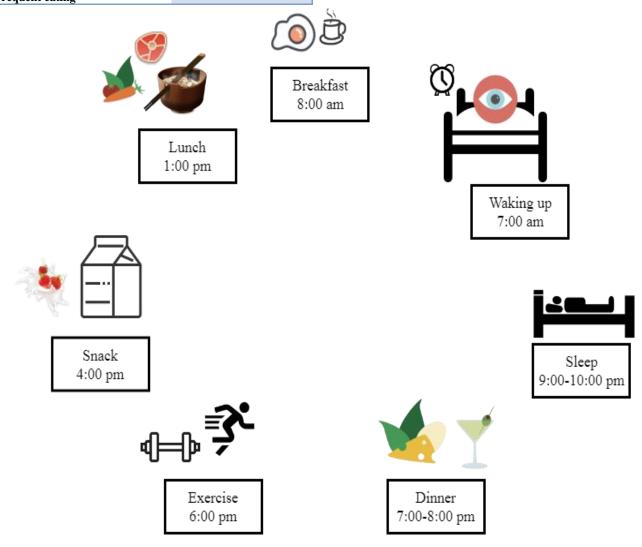


Figure 1: One-day model practice for weight loss.

Sleep-wake up and a few minutes later

Several studies were reviewed. The following points and advice were recommended.

The irregular sleep-wake system had been linked to disorganized eating patterns and hence body weight increased. Therefore, in time sleep and wake to contribute to weight loss. Quality of sleep and early waking up was shown to have an impact on body weight. A recent study highlighted that people sleeping 7-8 hours did not complain of any metabolic disturbances related to obesity. Sleeping at least 7 hours regularly played an important role in weight loss. 6.7 Short sleep hours have been linked to obesity due to elevated cortisol and low glucose tolerance, which, in turn, leads to fat accumulation. 8

The breakfast

Some investigators highlighted the importance of breakfast for bodyweight loss seekers and what kind of food to eat.⁹

Skipping breakfast, per contra, has a negative impact on body weight. Accordingly, regular breakfast intake had a positive effect on reducing body weight and even keeping it maintained for the long term. A study about the effect of breakfast on body weight indicated that a great reduction in BMI by 61% accompanied by a reduction in body fat and waist circumference.¹⁰ An important observation positively related satiety to protein-rich food intake, fiber and water content.¹¹ Therefore, options for ideal breakfast can include some but not all coffee, egg, cereal rich in fiber, milk, soup and rice.¹²

The lunch

Timing of meals effectively induced weight loss, late lunch eaters suffered to lose weight. ¹³ Therefore, the time one ate his lunch should keep it in mind to prevent weight gain. Fruits, vegetables and whole grains were found to be important sources of nutrients to maintain body weight and prevent weight gain. In addition, according to WHO recommendation protein, such as meat, fish and dairy products should account for 10-15% of energy intake. ¹⁴ A lunch containing fruitage, considerable servings of miscellaneous vegetables and whole grains and meat or fish as a source of protein (10%) was recommended.

Snacks

Body weight gain had been associated with a lack of snacking between meals and skipping breakfast.⁶ In contrast, other studies showed that snacks were associated with weight gain.¹⁵ Nevertheless, low-calorie protein-contained snacks were recommended such as dairy

products. ¹⁶ However, salty and high-fat snacks should be avoided. ¹⁷

The dinner

Leptin, a hormone that regulated satiety and hunger in humans by providing information to the brain when the stomach was empty was found to be at a high level when individuals were sleeping. ¹⁸ Consequently, eating dinner helps to keep leptin levels in check. High-calorie breakfast compared to dinner was positively linked to weight management. ¹⁹ Hence, it is advisable to eat a low-carbohydrate dinner early in the evening.

Water intake

Daily water intake was varied depending on temperature and climate. However, WHO recommended a 2.5 liter/day minimum for 70 kg humans.²⁰ A recent report linked increased water drinking and weight loss, which was thought to be due to the upregulation of atrial natriuretic peptide (ANP). ANP was responsible for activating proteins that boost fat catabolism.²¹

Exercise practice

As mentioned above, diet monitoring was a good practice to lose weight. However, increasing energy expenditure by exercise reduced body fat and promoted body composition, which was an advantage over diet restriction exclusively.22 Regular exercise was associated with weight loss despite the time of exercise.²³ Exercise accompanied with diet control enhanced muscle mass preservation.²⁴ Reducing the body fat will rationally increase the mass of the muscles proportionally or quantitatively.6 Therefore, to promote body shape, exercise should be performed regularly. Exercise training categorized into two main types: aerobic (walking, jogging or cycling) and resistance exercise such as weightlifting.²⁵ Cycling for 30-45 min three times a week significantly improved cardiorespiratory fitness and reduced body fat percentage.²⁴ Therefore, 30-45 min aerobic exercise thrice a week was recommended.

In addition to the effects of aerobic and resistance exercise alone or combined on body weight reduction, glycemic control of type 2 diabetes, enhanced physical fitness, improved mood. According to published data, resistance repetitions (rep) can increase gradually from 9 to 35 rep for a specific training, e.g., leg press, bench press, arm curl and squat on medium percentage. 25,26 Therefore, to maximize weight loss, an individual started with resistance training and then went to aerobic training. To prevent visceral fat accumulation following weight loss, exercise training was recommended. 27

Sleeping time

Circadian rhythm was represented by the sleep/wake cycle which was evident of internal timing system related to hormonal, biochemical and genetic factors. The main clock located in the hypothalamus of the brain was considered a master clock. This master clock was regulated by circadian oscillations in a single neuron. Environmental stimuli such as light can reset the circadian clock. Hormonal stimuli, such as cortisol can do the same.²⁸ This clock affected the metabolism of the liver by regulating the rhythm of enzyme transcription.²⁹ Therefore, sleeping at the right time for a reasonable duration effectively improved food metabolism.

Metabolism and endocrine disturbances, such as, reduced glucose and insulin metabolism, elevated cortisol level, increased ghrelin and decreased leptin have been linked to sleep restriction which increased hunger and appetite leading to obesity. Early sleep and early wake habit were scientifically proved to have effects on memory, academic performance.30 In addition, short-period sleep had been linked to weight gain. Melatonin, a hormone that regulated sleep and wakefulness its secretion started at 9:00 PM and stopped at 7:30 AM. So, for these benefits early go to bed and early rise is golden advice. A mouse experiment revealed that nocturnal feeding resulted in weight gain, disturbed the metabolic regulatory system and changed in genes involved in metabolism.³¹ Hence, early sleep prevented obesity and regulateed food metabolism.

Other valuable tips

Accepting one's body weight and confessing the problem, contributed to a positive outcome.³² To achieve effective weight loss, enroll in moderate to high intensity rather than low-intensity exercise.³³

Smartphone applications to monitor physical activity and calories intake such as, my fitness pal was found to help in weight loss and maintenance thereafter.³⁴ Pedometer's bracelets were also linked to encouraging people to exercise and increasing their self-confidence.³⁵

The frequency and timing of meals were associated with weight control because regular meal intake prevented metabolic disturbance and its attributes such as obesity and diabetes.³⁶ However, every now and then attributes, such as intermittent fasting for about 16 hour improved metabolic indicators.³⁷

Therefore, regular meal intake with days of restrictions was recommended.

CONCLUSION

This mini-review focuses on providing ideal daily practice and behaviors through which people can lose weight and maintain it thereafter rather than the

mechanism by which weight loss or gain occurred. Early go to bed and early rise, breakfast rich in protein and low in fibers, lunch full of protein, vegetables and wholegrain, low-calorie dairy products-based snacks, early light dinner, 30-45 min exercise are recommended to achieve weight loss and maintain it. In addition, continuous hydration by drinking water of at least 2.5 liters is distributed throughout the day.

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