

## Chapter 5

# The Mechanistic Approach to Tackle Obesity Using Traditional Herbal Plants

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### ABSTRACT

*Obesity is a medical metabolic condition where a person accumulates excess body fat that might affect their health. Obesity is a prevalent global health problem linked with other life-threatening chronic diseases like cardiovascular, certain types of cancer, diabetes, renal, cerebrovascular, bone, and muscle-related diseases. According to the World Health Organization (WHO), obesity is the fifth foremost cause of global deaths. Many allopathic drugs and surgical treatments for managing obesity are available in the market. However, these conventional methods have adverse side effects and chances of recurrence. For more than 2,000 years, herbal medicines have been used for the treatment of many diseases efficiently. This chapter addresses the current progress in the effectiveness of several herbal medications used for the treatment of obesity without causing side effects. The possible effects and mechanisms of using these herbaceous plants in the treatment of obese and overweight humans and animals are covered extensively.*

### INTRODUCTION

The obese and overweight population is growing around the world. It is affecting people of all age groups and sex. Obesity leads to many chronic diseases, which is rising morbidity and mortality all across the globe. The increase in fat accumulation can be because of more fat absorption, increased lipogenesis, reduced lipolysis, or any combination of these three processes. The primary treatment for overweight and obese people is increasing exercise and decreasing the number of calories per meal. But this method is very time consuming and challenging to adhere mostly for unmotivated individuals. Hence, numerous methods for eliminating obesity are being used all over the world. Several medicines are being produced, and many are still undergoing research. These medicines are worked on, keeping four main actions of energy balance in mind, including appetite suppressants, fat absorption (i.e., Orlistat), stimulators of

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thermogenesis, and fat mobilization stimulators. Some of these are allopathic medications (Padwal and Majumdar 2007), different types of aesthetic surgeries (Fried et al. 2007), and various kinds of nutrient specific diets (Yannakoulia, Poulimeneas, Mamalaki & Anastasiou 2019) which are used to cure obesity. But most of the synthetic medicines used for treating obesity have several adverse side effects (Al-Tahami et al. 2017). Quite the same happens with the surgeries where weight maintenance becomes a problem, especially after surgeries like liposuction (Liposuction - Mayo Clinic, 2020). Other bariatric surgeries have strict restrictions on several types of food, deficiencies of vitamins and minerals, and scars as a consequence of operation (Fried et al. 2007). Due to problems in pharmacotherapy and years of significant concern with the modern medicinal system and also difficulties in sustaining lifestyle modification, additional attention has been paid to herbal medicine as a practical, healthy and inexpensive alternative for reducing body weight and body fat (Ranjbar, Jouyandeh, Abdollahi and Systematic 2013). Isolated compounds extracted from herbal plants and their parts (Karri et al. 2019) have become popular as the raw material for the production of obesity treatments (Amin and Nagy 2009).

Although numerous research have been conducted worldwide to study the treatment and management of obesity, it remains a challenging issue (Cheng, 2006). This chapter focusses on prevalence, influencing factors, cause, risk, and treatments of obesity. Different strategies to tackle the epidemics of obesity will include non-medical and medical approaches. Positive and negative effects of using the allopathic and in-depth study of efficacy, safety, effectiveness, and potential mechanism of herbal medicine are discussed in this chapter.

## **OBESITY**

WHO measures obesity by using the Body mass index(BMI) scale. An individual with BMI between 25-29.9 is scaled to be overweight and equal to or above 30 is considered obese. This index is for both male and female adults (Obesity and overweight, 2020). Obesity can be characterized as excessive increased adipose tissue to the extent that it can cause adverse health effects in the human body.

The leading cause of obesity is an imbalance in energy between calories consumed (Verma, 2014) and burned. This imbalance can be due to many factors, including inherited gene, hormonal imbalance, side effects of medicines taken for some other diseases, etc. as suggested by the authors Darbre (2017), Verhaegen (2017).

According to WHO, obesity is related to cardiovascular diseases, hypertension, diabetes mellitus, gallbladder disease, cancer, endocrine and metabolic disturbances, osteoarthritis, Gout, pulmonary diseases, as well as psychological issues, including social bias, prejudice, discrimination, and overeating (Obesity and overweight, 2020). Obesity is now one of the most prevalent health problems in all populations and age groups globally, resulting in substantial mortality and morbidity increases (Fleming and Robinson, 2013).

Researcher like Harvey & Ogden (2014) claim that in reducing obesity, at least about 5% or more weight loss should be viewed as a healing agent. Studies have shown that weight loss of 5% to 10% can make people vulnerable to some diseases such as type 2 diabetes mellitus, cardiovascular disorders can minimize and reduce other complications linked to obesity (Harvey and Ogden 2014).

Obesity can be caused by the following factors and can have many health risks, as summarized in Figure.1. Furthermore, the prevalence of obesity and its treatment and their limitations are also discussed in this chapter.

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