Herbal Drugs used in the Treatment of Obesity

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ABSTRACT

Obesity has emerged as a significant global health concern, presenting substantial challenges to public health and healthcare systems around the world. There's a rising interest in exploring alternative methods for addressing obesity, such as the use of herbal medications. This review provides a comprehensive overview of herbal drugs commonly employed in obesity management. It includes a systematic search of pertinent databases to identify studies investigating the efficacy and safety of herbal remedies for obesity. The review summarizes the pharmacological properties, anti-obesity effects, and potential adverse effects of Thea sinensis, Coffea arabica, Hibiscus sabdariffa, and other herbal remedies. Additionally, it delves into the potential synergistic effects of combining herbal treatments and underscores the importance of standardization, quality control, and safety considerations when using herbal drugs to manage obesity. In conclusion, herbal drugs present promising opportunities for developing innovative therapeutic approaches to obesity. Nonetheless, further research is required to fully grasp their potential and ensure their safe and effective utilization in clinical settings.

Keywords: Obesity, Epidemiology, Phytochemicals, Theasenesis, Coffea arabica, Hibiscus sabdariffa, constituents.

INTRODUCTION

Obesity is recognized as a condition characterized by an increase in both the size and number of fat cells in the body. Its classification is based on anatomical considerations, taking into account factors such as the quantity and distribution of adipocytes, as well as the characteristics of localized fat deposits. Additionally, obesity is widely acknowledged as a significant risk factor for various health issues, including diabetes, gallbladder disease, cardiovascular ailments, hypertension, sleep apnea, osteoarthritis, and certain types of cancer. Given that cardiovascular disease is a leading cause of mortality in the United States and other countries, efforts to address obesity should primarily focus on reducing the associated cardiovascular risks.

Epidemiology

With close to 60% of U.S. adults currently falling under the categories of overweight or obese, it stands as one of the most prevalent chronic medical issues encountered by primary care physicians. These individuals are more prone to harboring silent health issues like hypertension, increased lipid profile, and Non insulin dependent Diabetes Mellitus, alongside various other complaints necessitating medical intervention. Although the U.S. Preventive Services Task Force advises regular height and weight assessments, combined with counseling on physical activity and balanced diets, research shows that fewer than fifty percent of obese adults report receiving weight loss guidance from healthcare professionals. Furthermore, analysis of physician office visits during 1995–96 revealed that obesity was documented in merely 8.6% of patient encounters, significantly lower than the prevailing prevalence rates.[1]

Several factors contribute to the improper identification and mistreatment of obesity, including inadequate reimbursement, time constraints during consultations, insufficient training in counselling, and low confidence in the
ability to induce behavioural changes in patients. This chapter is divided into two segments to address these issues: the first offers a broad overview of the challenges and considerations pertinent to managing overweight and obese patients within the primary care setting, while the second furnishes a pragmatic delineation of the evaluation and treatment procedures for obesity, which should ideally form an integral part of patient care protocols incorporated into the care of all patients.[2]

Table 1: Examples of the plants used in treatment of obesity

<table>
<thead>
<tr>
<th>Herbal plants</th>
<th>Family</th>
<th>Parts used</th>
<th>Chemical constituents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Camellia sinensis</strong></td>
<td>Theaceae</td>
<td>Leaves</td>
<td>Caffeine, polyphenols like catechins and flavonoids, alkaloids such as caffeine, theobromine, and theophylline.</td>
<td></td>
</tr>
<tr>
<td><strong>Coffea Arabica</strong></td>
<td>Malvaceae</td>
<td>Leaves</td>
<td>Caffeine, tannin, fixed oil, carbohydrates, and proteins are components found in the substance.</td>
<td></td>
</tr>
<tr>
<td><strong>Hibiscus Sabdariffa</strong></td>
<td>Rubiaceae</td>
<td>Flower</td>
<td>Delphinidin, p-Coumaric acid, DPPH, Myricetin, Neochlorogenic acid.</td>
<td></td>
</tr>
<tr>
<td><strong>Panax Ginseng</strong></td>
<td>Araliaceae</td>
<td>Leaves</td>
<td>Ginseng saponins, ginseng oils, and phytosterols.</td>
<td></td>
</tr>
<tr>
<td><strong>Caralluma Fimbriata</strong></td>
<td>Apocynaceae</td>
<td>Flower</td>
<td>Pregnane glycosides, flavone glycosides, megastigmage glycosides.</td>
<td></td>
</tr>
<tr>
<td><strong>Tripterygium Wildfordii</strong></td>
<td>Celastraceae</td>
<td>Roots, Leaves</td>
<td>Diterpenes, triterpenes, glycosides, and alkaloids.</td>
<td></td>
</tr>
<tr>
<td><strong>Emblica officinalis</strong></td>
<td>Euphorbiaceae</td>
<td>Fruit</td>
<td>Tannins, along with gallic acid, ellagic acid, and chebulinic acid.</td>
<td></td>
</tr>
<tr>
<td><strong>Bacopa monnieri</strong></td>
<td>Scrophulariae</td>
<td>Leave, Stem</td>
<td>Bacoside-A and bacoside-B.</td>
<td></td>
</tr>
<tr>
<td><strong>Trigonella foenum- graecum</strong></td>
<td>Fabaceae</td>
<td>Seeds</td>
<td>Carbohydrates, proteins, lipids, alkaloids, flavonoids, dietary fibers, saponins, steroidal saponins.</td>
<td></td>
</tr>
</tbody>
</table>

| **Zingiber officinale** | Zingiberaceae | Roots | 6-gingerol, 8-gingerol, and 10-gingerol. |   |
| **Camunium cyminum**   | Apiaceae       | Seeds  | The monoterpenes beta-pinene, p-cymene, and gamma-terpinene, along with terpenoid aldehydes. |   |
| **Ephedra sinica**     | Ephedraceae    | Stem   | vicenin-1, and vicenin-2, along with tannins and benzyl-methylamine. |   |
| **Hemidesmus indicus** | Apocynaceae    | Roots  | Hexatriacontane, its octacosanoate, α-amyrin, β-amyrin, its acetate, and sito-sterol. |   |
| **Gymnema sylvestere** | Apocynaceae    | Leaves | Gymnemic acid, tartaric acid, gurmarin, calcium oxalate, glucose, stigmasterol, betaine. |   |
| **Hoodia gordonii**    | Asclepiadaceae | Succulent | Steroid, glycosides, fatty acids. |   |
| **Withania somnifera** | Solanaceae     | Roots, Stem | Alkaloids, steroids, saponins, phenolics, flavonoids, phytophenols, and glycosides. |   |
| **Allium sativum**     | Liliaceae      | Bulb    | Potassium, calcium, magnesium, phosphorus, iron, manganese, selenium, vanadium, copper, and zinc. |   |
| **Cinnamomum zeylanicum** | Lauraceae | Bark    | Cinnamaldehyde, cinnamate, cinnamic acid, and various essential oils. |   |
| **Curcuma longa**      | Zingiberaceae  | Stem    | Germacrone, curcuminoïd, curcumin, and volatile oils. |   |
| **Capsicum annuum**    | Solanaceae     | Fruit   | capsaicin, 6,7-dihydrocapsaicin, nordihydro- capsaicin, homodihydro-capsaicin, and homo-capsaicin. |   |
Herbal drugs used to treat obesity

Natural plant products are extensively utilized in healthcare and as dietary supplements. They have been part of human history since the dawn of civilization, making them nearly as ancient as life itself.[3] Recently, there has been a growing interest in dietary chemicals as potential therapeutic agents for promoting health and combating obesity. Plant products have been a rich source for discovering new drugs due to their chemical diversity and ability to influence various biological targets. They are commonly used in complementary and alternative medicine systems. The presence of multiple chemical combinations in plant-based medicines can lead to synergistic effects by targeting multiple molecular pathways, providing advantages over treatments based on single constituents.[4-6]

Some drugs which possess antiobesity effect are as follows:

Thea Senesis

Tea tree, scientifically known as Camellia sinensis, is a plant belonging to the Theaceae family, typically found as a bush or small tree in tropical and subtropical regions worldwide. The predominant cultivar in Southeast Asia is Camellia sinensis, while in India and Sri Lanka, it's Camellia sinensis assamica. Varieties of tea are distinguished by their processing methods whether through fermentation with bacteria or oxidation and their resultant taste, color, aroma, and biological properties. These variations include white, green, matcha, black, oolong, and other types of tea.[7-8]

The polyphenols found in green tea have shown effectiveness in combating chronic inflammatory conditions affecting the liver, gastrointestinal tract, and neurodegenerative diseases. This anti-inflammatory capability is attributed to their influence on the gastrointestinal microbes, which plays a crucial role in immune responses.[9-10]

The balanced presence of tea molecules has been found to alleviate anxiety and stress. Research has established a connection between the consumption of green tea and the memory function of older men.[11] Interestingly, while this association was observed in older men, there was no discernible impact on the memory of older women.[12]

Catechins present in tea exhibit anti-tumor properties by inhibiting cell proliferation, inducing apoptosis (cell death) and autophagy, and decreasing the viability of cancer cells.[13] Additionally, they have the potential to augment the therapeutic efficacy of medications used to treat tumor-related diseases while mitigating their associated adverse effects.[14-16]

Active Constituents of Thea Senesis

Caffeine: Tea, like coffee, contains caffeine, though typically in lower amounts. Caffeine functions as a stimulant for the central nervous system, enhancing alertness and reducing fatigue. However, the caffeine levels in tea are generally lower than those in coffee, resulting in a milder stimulant effect.

Polyphenols: Tea boasts a wealth of polyphenolic compounds, encompassing flavonoids and catechins, renowned for their antioxidant prowess. These polyphenols actively combat free radicals, thereby mitigating oxidative stress and inflammation within the body. Notably, catechins, including epigallocatechingallate (EGCG), have garnered attention for their potential to support cardiovascular health and aid in cancer prevention.

Theanine: Abundant in green and black teas, theanine is an amino acid that contributes to tea's distinct flavor profile and purported relaxation properties. Research indicates its potential to alleviate stress and anxiety, foster relaxation without inducing drowsiness, and even enhance cognitive function.

Catechins: Predominantly found in green tea, catechins are a subclass of flavonoids celebrated for their antioxidant attributes. These compounds have been extensively investigated for their anti-inflammatory, anticancer, and cardioprotective properties of particular note is EGCG, the primary catechin in green tea, renowned for its robust antioxidant activity and associated health benefits.

Theaflavins and Thearubigins: These compounds are exclusive to black tea, emerging during the oxidation process inherent in black tea fermentation. Theaflavins and thearubigins contribute significantly to black tea's color, aroma, and flavor profile. While possessing antioxidant properties, ongoing research aims to elucidate their specific health impacts.

Together, these active constituents underscore the multifaceted appeal and potential health benefits associated with tea consumption.
Anti Obesity Effects of Thea Senesis

Numerous studies have confirmed that tea and its constituents possess the capacity to decrease fat accumulation and body weight in humans.\[^{16-23}\]

The observed effect was attributed to the presence of polyphenols.\[^{24}\] Existing evidence suggests that epigallocatechin and caffeine, both derived from tea leaves, operate through distinct mechanisms, yet their combined action synergistically contributes to weight loss.\[^{25-26}\] They impact the neuroendocrine metabolic regulators controlling appetite, resulting in decreased food intake.

They diminish the emulsification and absorption of lipids and proteins within the gastrointestinal system, leading to a decrease in calorie intake. Additionally, they exert influence on the gastrointestinal microbiota, particularly lactobacteria, crucial for digestion. For instance, these microorganisms produce short-chain fatty acids, which enhance lipid metabolism rates.\[^{22-23}\]

They impede the differentiation and proliferation of pre-adipocytes, decrease lipid production,\[^{23}\] facilitate lipolysis and lipid metabolism,\[^{22}\] induce the transformation of white adipose tissue into brown, enhancing its oxidation and energy expenditure through heat production,\[^{24-27}\] and encourage the excretion of lipids through feces.

Adverse Effects of Thea Senesis

Tea is generally regarded as safe for most individuals when enjoyed in moderate amounts. However, excessive intake or certain varieties of tea may potentially lead to adverse effects:

Caffeine Sensitivity: Tea contains caffeine, which in high doses can result in insomnia, restlessness, elevated heart rate, and anxiety. Some individuals may be more sensitive to caffeine, experiencing these effects even with moderate tea consumption.

Digestive Discomfort: Overconsumption of tea, particularly on an empty stomach, can cause gastrointestinal issues such as stomach upset, acid reflux, or, in some cases, ulcers. This is especially noteworthy with strong teas or those high in caffeine content.

Effect on Iron Absorption: Some constituents found in tea, such as tannins, may bind with iron present in food, which could lead to decreased absorption of iron within the body. This might pose a concern for individuals with iron deficiency anemia or those who primarily rely on plant-based sources of iron.

Allergy Concerns: While rare, certain individuals may experience allergic reactions to particular elements of tea, such as tea pollen or proteins within the leaves. Allergic manifestations can vary from mild symptoms such as itching and hives to more severe reactions like anaphylaxis.

Interactions with Medications: Certain compounds in tea, including catechins, might interfere with the absorption or efficacy of certain medications. This is particularly relevant for drugs like warfarin, where sudden variations in vitamin K intake (found in green tea) could impact medication levels.

Dental Health Concerns: Tea, particularly black tea, has the potential to stain teeth over time. Additionally, when consumed with sugar or honey, tea may contribute to tooth decay and cavities.

Considerations During Pregnancy: While moderate tea consumption is generally deemed safe during pregnancy, excessive intake, particularly of caffeinated teas, might be associated with an increased risk of miscarriage or low birth weight. Pregnant individuals are often advised to limit caffeine intake.

Urinary Effects: The diuretic effects of caffeine in tea might lead to an increase in urinary frequency or urgency for some individuals. This could potentially worsen urinary incontinence or bladder issues in susceptible individuals. It's essential to recognize that most of these adverse effects are associated with excessive consumption or individual sensitivities. For the majority of people, moderate tea consumption can be part of a balanced lifestyle and may even offer health benefits due to its antioxidant content and other bioactive compounds. As with any dietary choice, moderation and awareness of personal tolerance levels are key. If you have concerns or experience persistent adverse effects from consuming tea, consulting with a healthcare professional is advisable.

Coffea Arabica

Coffee originates from the seeds, often called beans, of the Coffea plant, primarily Coffea arabica and Coffea canephora (also known as Coffea robusta). These plants are members of the Rubiaceae family and are indigenous to tropical areas of Africa and Asia.
Active Constituents of Coffea Arabica

Coffee is well-known for its caffeine content, which is a natural alkaloid serving as a stimulant for the central nervous system. The mechanism of caffeine involves blocking adenosine receptors in the brain, thus counteracting the inhibitory effects of adenosine and enhancing alertness and wakefulness.

Chlorogenic Acids: These phenolic compounds are abundant in coffee beans and possess antioxidant properties. Chlorogenic acids contribute to the bitter taste of coffee and are believed to have various health benefits, including anti-inflammatory and cardioprotective effects.

Trigonelline: Formed during the roasting process, trigonelline is an alkaloid with potential antimicrobial properties. It is also a precursor to nicotinic acid (niacin), a B vitamin.

Cafestol and Kahweol, two chemicals present in the oily component of coffee, play a role in its aroma and taste profile. Despite their known association with elevating cholesterol levels, these compounds also demonstrate potential benefits such as anticancer and liver properties.

Antiobesity Effects of Coffea Arabica

It inhibits multiplication of adipocytes.[28]

It affects transcription factors and other proteins that participate in the production of lipids within these cells.[28-29]

By influencing the gastrointestinal microbes, which can also impact obesity.[30]

Thermogenic Properties: Coffee, containing caffeine, a natural stimulant, is recognized for its thermogenic effects, elevating thermogenesis and enhancing fat oxidation. Through this mechanism, caffeine boosts metabolic rate and energy expenditure, potentially aiding in calorie burning and facilitating weight loss.

Appetite Regulation: Caffeine, alongside other bioactive constituents in coffee, demonstrates appetite-suppressing properties by modulating satiety hormones and neural pathways involved in hunger regulation. This suppression of appetite may contribute to reduced food intake, supporting weight management efforts.

Metabolic Regulation: Abundant in coffee, chlorogenic acids, a class of polyphenolic compounds, have garnered attention for their potential to regulate glucose and lipid metabolism. By inhibiting fat absorption, promoting fat breakdown, and enhancing insulin sensitivity, chlorogenic acids offer promising prospects for weight management and metabolic health enhancement.

Gut Microbiota Modulation: Coffee polyphenols have been shown to influence the composition and activity of gut microbiota, essential players in energy metabolism and adiposity. Through fostering a balanced gut microbiome, coffee consumption may facilitate weight control and optimize metabolic function.

Enhancement of Physical Performance: The presence of caffeine in coffee has been associated with improved physical performance and endurance during exercise. By heightening energy levels and delaying the onset of fatigue, caffeine enables individuals to engage in more intense and prolonged physical activity, thereby supporting weight management goals and overall physical health.

Synergistic Effects: The combined action of caffeine and other bioactive compounds, such as chlorogenic acids and polyphenols, present in coffee may yield synergistic effects on weight management and metabolic health. These compounds may collaboratively enhance fat metabolism, suppress appetite, and ameliorate metabolic parameters, reinforcing the potential benefits of coffee consumption in promoting overall well-being.

Adverse Effects of Coffee

Ingesting caffeine in high amounts may lead to anxiety, insomnia, calcium loss from the body, and potentially increase the risk of fractures, particularly in individuals with osteoporosis.[29] Concerns regarding the potential negative impacts of caffeine on brain development and the development of reproductive organs in embryos and children have not been completely ruled out.[30] Some evidence suggests that caffeine and coffee consumption could adversely affect sperm quality and extend pregnancy duration.[31] Furthermore, cafestol and kahweol have been linked to elevated blood cholesterol levels.[32] Despite these findings,
comprehensive studies have not found any statistically significant associations between coffee or caffeine intake and the occurrence of health issues among adults, pregnant women, adolescents, and children.[33] Conversely, these studies have identified potential positive effects of coffee and caffeine consumption on health and longevity.

Calorie Intake from Additives: Many popular coffee beverages, such as flavored lattes, mochas, or frappuccinos, are often loaded with added sugars, syrups, whipped cream, and other high-calorie ingredients. Excessive consumption of these calorie-dense coffee drinks can significantly contribute to overall calorie intake and promote weight gain or hinder weight loss efforts.

Sweeteners and Creamers: Adding sugar, flavored syrups, or creamers to coffee can increase its calorie content and glycemic load. High intake of these added sugars and fats can lead to insulin resistance, weight gain, and obesity, especially when consumed regularly in large quantities.

High-Calorie Coffee Accompaniments: Pairing coffee with high-calorie snacks or pastries, such as muffins, doughnuts, or croissants, can further increase calorie intake and contribute to weight gain. These calorie-dense foods are often consumed alongside coffee, especially as part of morning routines or social gatherings.

Impact on Appetite Regulation: While some studies suggest that caffeine in coffee may temporarily suppress appetite and reduce food intake, others indicate that habitual caffeine consumption may lead to tolerance, diminishing its appetite-suppressing effects over time. Moreover, caffeine withdrawal symptoms, such as increased appetite and cravings, may prompt individuals to consume more calories, potentially contributing to weight gain.

Sleep Disturbance: Consuming excessive caffeine, especially later in the day, can disrupt sleep patterns and diminish sleep quality. Poor sleep is linked to hormonal disruptions, heightened appetite, cravings for high-calorie foods, and weight gain. Those who consume coffee in the late hours might experience more sleep disturbances and consequently face weight-related challenges.

Stress Response: High caffeine intake from coffee can activate the body's stress response system, leading to elevated cortisol levels. Chronic stress and elevated cortisol levels are associated with abdominal obesity and metabolic dysfunction. Prolonged activation of the stress response due to excessive coffee consumption may contribute to weight gain and obesity-related complications.

Insulin Sensitivity: Certain studies indicate that continual caffeine intake could potentially compromise insulin sensitivity, raising the likelihood of developing type 2 diabetes and metabolic syndrome. Those with impaired glucose metabolism or insulin resistance might be more vulnerable to coffee's negative metabolic impacts, particularly when consumed excessively or with additional sugars.

**Hibiscus Sabdariffa**

Hibiscus, scientifically known as *Hibiscus sabdariffa* and commonly referred to as Roselle, is a member of the Malvaceae family and is highly regarded for its pharmacognostic properties. Rich in various bioactive compounds like flavonoids, anthocyanins, polysaccharides, organic acids, and phenolic compounds, hibiscus is renowned for its diverse medicinal properties. Traditionally, it has been employed for its antioxidant, anti-inflammatory, hypotensive (blood pressure-lowering), hypolipidemic (cholesterol-lowering), and diuretic effects. Hibiscus preparations, commonly in the form of teas or extracts, have found utility in traditional medicine for managing a spectrum of conditions including hypertension, hyperlipidemia, obesity, diabetes, liver disorders, digestive issues, and respiratory infections.

**Active Constituents of Hibiscus Sabdariffa**

The primary active constituents responsible for the physiological effects of the calyx of Hibiscus are anthoyanins and polyphenols, including protocatechuic acid and quercetin. Progress has also been achieved in understanding the mechanisms of action. Key bioactive compounds found in the aqueous extract of *H. sabdariffa* include flavonoids (such as quercetin, luteolin, and its glycoside), chlorogenic acid, gossypetin, hibiscetin, phenols, certain phenolic acids, and anthocyanins like delphinidin-3-sambubioside and cyanidin-3-sambubioside.[35-36]

Bioactive compounds refer to substances synthesized by plants, possessing pharmacological
Numerous natural compounds have been recognized for their ability to influence weight loss, inhibit fat accumulation, and prevent diet-induced obesity. Consequently, these substances have been widely utilized for addressing abdominal obesity and overweight conditions.\[38-40\]

Certain researchers have identified polyphenols\[41-43\] and anthocyanins\[44-45\] as the primary active constituents in Hibiscus. Conversely, another group of authors in their findings suggested that other organic acids found in Hibiscus, such as hibiscus acid, di-methyl hibiscus acid, and hydroxyl-citric acid, were accountable for the observed beneficial effects.\[46\]

Anti Obesity Effects of Hibiscus Sabdariffa

Obesity, characterized by the buildup of surplus fat in the body, disrupted energy balance, and enhanced lipid synthesis, leads to an augmented mass of adipose tissue through adipogenesis, presenting significant health hazards. Its widespread occurrence has imposed a substantial economic strain on healthcare systems worldwide. Utilizing bioactive compounds presents one potential avenue for addressing the challenges associated with obesity.\[47\]

We critically assessed the impact of Hibiscus extract (HSE) on various factors linked to obesity development, including its effects on body weight, lipid accumulation, cholesterol metabolism, plasma parameters, inhibitory action on pancreatic lipase, and impact on adipocyte differentiation/adipogenesis. It synthesized findings on the anti-obesity properties of Hibiscus bioactive compounds across cell, animal, and human studies. Toxicology data on Hibiscus consumption suggests that toxicity is dose-dependent and could lead to adverse effects with prolonged use. Studies indicate that bioactive compounds derived from Hibiscus are effective in treating obesity, evidenced by reduced body weight, inhibition of lipid accumulation, and suppression of adipogenesis via the PPARγ pathway and other transcriptional factors.\[47\]

Research studies indicate that hibiscus extracts hold promise in addressing obesity through diverse mechanisms. Its antioxidative properties play a pivotal role in counteracting oxidative stress, a significant contributor to obesity-related complications. Moreover, hibiscus extracts exhibit potential in regulating lipid metabolism by curbing lipid accumulation and facilitating fat breakdown. Additionally, their hypolipidemic effects aid in reducing cholesterol levels, thus bolstering endeavors in weight management. Furthermore, the consumption of hibiscus may contribute to appetite suppression and enhanced satiety, potentially curtailting calorie intake and bolstering efforts toward weight loss objectives. In summary, the anti-obesity attributes of Hibiscus sabdariffa present it as a promising natural intervention for addressing obesity and its associated health concerns.

Adverse Effects of Hibiscus Sabdariffa

Hibiscus sabdariffa is commonly considered safe when consumed in usual food portions.\[48\] When prepared as a tea, it may potentially provide advantages in managing hypertension. The fruit acids found in Hibiscus sabdariffa may have a mild laxative effect, whereas other plant compounds could aid in reducing high blood pressure, lowering blood sugar and lipid levels, reducing inflammation, and demonstrating antibiotic properties.\[48\] Hibiscus is commonly utilized for addressing conditions such as high blood pressure and high cholesterol, among others. However, there is limited scientific evidence to substantiate many of these purported benefits.\[48\] A review of clinical trials involving hibiscus revealed that none of the included studies reported significant side effects associated with its usage. However, another review has highlighted that much of the available data regarding hibiscus comes from animal studies, posing challenges in comprehending the full spectrum of potential side effects in humans.\[50\] While uncommon, the side effects most frequently associated with hibiscus include upset stomach, gas, and constipation. If you encounter any side effects, discontinue the use of hibiscus and seek advice from a healthcare professional.\[51\] Although allergies to hibiscus or other plants in the Malvaceae family, such as the marshmallow plant, are not severe in all cases, it's important to be cautious. Refrain from using hibiscus if you are aware of any existing allergy to plants in the Malvaceae family.\[49\] If you develop an allergic reaction while using hibiscus, discontinue its use immediately and consult with a healthcare provider.\[51\]
CONCLUSION
Herbal drugs have been traditionally used for the treatment of obesity due to their potential fat-reducing and appetite-suppressing effects. While some herbal drugs have shown promising results in reducing body weight and body mass index (BMI), their efficacy and safety have not been established through rigorously controlled clinical trials. It is important to note that herbal drugs may also interact with other medications and have potential side effects, which may be harmful for patients. Therefore, it is recommended that individuals with obesity seek advice from a qualified healthcare provider before using herbal drugs. A comprehensive weight loss plan that includes dietary modifications, physical activity, and behavioral therapy may be more effective in managing obesity in the long term. While tea, coffee, and hibiscus might offer some potential advantages, it is crucial to remember that they should not be relied upon as a definitive solution for obesity. Achieving successful weight management usually requires a comprehensive strategy, which includes maintaining a balanced diet and engaging in regular physical activity. If you're contemplating integrating dietary supplements or herbal beverages into your weight loss regimen, it's recommended to seek guidance from a qualified healthcare provider. They can offer personalized recommendations tailored to your individual needs and circumstances.

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Conflict of Interest
The authors and this content is in no conflict of interest with any other information or media.

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