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Herbal Agents for Weight Loss and Anti-Obesity: A Review of Traditional Iranian Medicine

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A B S T R A C T

Objective: Obesity and the accumulation of fat in the abdominal and flank regions are major public health challenges. Beyond aesthetic concerns, they significantly increase the risk of chronic metabolic and cardiovascular diseases. Traditional Iranian medicine (TIM) offers a natural and complementary approach to obesity management through a diverse array of medicinal plants. This review aims to identify and summarize the most prominent and frequently used herbal remedies for controlling and treating abdominal and flank obesity in classical TIM sources.

Methods: This study was conducted as a literature review of classical TIM manuscripts and authoritative herbal medicine references focused on obesity management. Complementary searches were performed in recognized scientific databases, including ISC, SID, PubMed, Google Scholar, and Magiran, using Persian and English keywords related to "medicinal plants," "obesity", and "abdominal and flank fat." Relevant articles and online sources were gathered and analyzed to provide a comprehensive overview of effective herbal interventions.

Results: The findings reveal that a wide variety of medicinal plants demonstrate significant effects on weight reduction and obesity control. Zingiberaceae such as ginger, turmeric, and cardamom; Lamiaceae like thyme, savory, and rosemary; and Apiaceae including celery, ajwain, cumin, and fennel were found to enhance metabolism and reduce fat accumulation. Asteraceae species such as chamomile and yarrow improve digestion and regulate blood sugar, while legumes including peanuts, soy, and fenugreek contribute to appetite suppression. Additionally, Rosaceae plants like apple, rose, and damask rose provide antioxidant compounds, and other plants such as mustard, khakshir, saffron, barberry, black seed, garlic, and lemon balm also demonstrate anti-obesity effects through diverse mechanisms.

Conclusion: This review highlights that TIM offers a broad spectrum of medicinal plants effective in weight reduction and obesity management. Proposed mechanisms include increased basal metabolism, inhibition of fat absorption, and improved gastrointestinal function. Nonetheless, definitive evidence regarding their efficacy and safety requires well-designed, large-scale clinical trials.

Keywords: Obesity, abdominal fat, medicinal plants, treatment, traditional medicine, Iran

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Introduction

Obesity, defined as the abnormal and excessive accumulation of body fat, has emerged as a major public health concern over recent decades [1]. Common indicators for assessing obesity include body mass index (BMI), waist circumference, and waist-to-hip ratio, with abdominal and visceral obesity carrying particular clinical significance [2]. The body mass index (BMI) serves as a measure for assessing an individual's weight relative to their height and is commonly employed to determine their weight status. According to standard definitions, a BMI ranging from 25 to 29.9 indicates overweight, while a BMI of 30 or higher signifies obesity [2].

Overweight and fat accumulation are hallmark features of obesity, typically measured by BMI; values equal to or exceeding 30 are considered obese. When obesity is present, identifying underlying causes and consulting a nutrition specialist is advised [3].

In addition to cosmetic implications, obesity increases the risk of chronic metabolic and cardiovascular disorders such as type 2 diabetes, hypertension, dyslipidemia, and coronary artery disease, and may also elevate the likelihood of certain cancers, musculoskeletal disorders, and reduced quality of life [4]. The etiology of obesity is multifactorial, encompassing genetic predispositions, sedentary lifestyle, high-calorie diets, hormonal imbalances, gut microbiota disturbances, and psychosocial factors [4,5]. Epidemiological studies indicate a sharp global rise in obesity, with abdominal obesity becoming increasingly prevalent among adults and even children and adolescents [5,6]. From a pathophysiological perspective, visceral fat accumulation triggers low-grade chronic inflammation, insulin resistance, disrupted adipokine secretion, and increased oxidative stress, all of which contribute to obesity-related complications [6,7].

While various pharmacological interventions exist including appetite suppressants, lipase inhibitors, and metabolic modulators these drugs often carry notable side effects such as gastrointestinal disturbances, cardiovascular risk elevation, and psychological complications, limiting their long-term use [8-10].

In recent decades, the rising prevalence of obesity and associated metabolic disorders has prompted governments, health organizations, and medical professionals to emphasize prevention and management through balanced diet and active lifestyle interventions [11–13]. Effective strategies include daily physical activity 20–30 minutes of walking, swimming, or cycling), consumption of nutrient-dense foods such as fruits, vegetables, whole grains, and low-fat proteins, and limiting high-calorie, high-fat foods [14–16].

Beyond modern interventions, traditional medical systems have historically contributed to the prevention and management of obesity. In particular, Traditional Iranian Medicine (TIM) has long emphasized a holistic approach, combining lifestyle modification, dietary regulation, and natural remedies to maintain metabolic health and manage body weight [17–19]. Classical Iranian texts contain detailed recommendations for herbs and dietary practices aimed at controlling abdominal and flank fat, improving digestion, and regulating overall metabolism [20–22].

Medicinal plants, as a central pillar of TIM, may influence weight and visceral fat through mechanisms such as appetite suppression, enhanced lipolysis, thermogenesis stimulation, and modulation of fat and glucose metabolism [20,21]. Despite the growing interest in the use of medicinal plants for obesity management, the rich knowledge of Traditional Iranian Medicine (TIM) has been comparatively underexplored. Classical TIM texts offer guidance on controlling abdominal and flank fat, yet the underlying mechanisms and clinical potential of these remedies remain scientifically unelucidated. This systematic review aims to identify and analyze the key medicinal plants of TIM and to examine their mechanisms of action. Given the rising prevalence of obesity and the limitations of conventional pharmacotherapy, systematically investigating and documenting the anti-obesity effects of medicinal plants from the TIM perspective holds both scientific and clinical significance. The present review identifies and analyzes the most important and widely used herbal remedies for managing abdominal and flank obesity in classical Iranian sources

Methodology

This study was conducted as a systematic review of classical sources of Traditional Iranian Medicine (TIM) and reference texts on medicinal plants relevant to obesity management. In the first stage, traditional sources were examined to extract medicinal plants mentioned for reducing weight and abdominal and flank fat.

To complement traditional knowledge and align it with modern scientific evidence, an extensive search was conducted across reputable databases, including ISC, SID, PubMed, Google Scholar, and Magiran. Both Persian and English keywords related to "medicinal plants," "obesity," "weight loss," and "abdominal/flank fat" were employed.

Inclusion and Exclusion Criteria

Inclusion criteria:

Articles and sources addressing medicinal plants associated with weight reduction and abdominal/flank fat, possessing adequate scientific quality, available in full text, and published in Persian or English.

Exclusion criteria:

Incomplete sources, studies unrelated to the study objectives, publications of low scientific quality, or sources without accessible full texts were excluded from review.

The collected data were subsequently categorized and analyzed to provide a comprehensive overview of effective herbal interventions for weight and abdominal fat reduction.

Results

Reviewing classical TIM texts and Iranian medicinal plants reveals that herbs such as ginger, thyme, apple, peanut, celery, ajwain, soy, green tea, turmeric, black pepper, cinnamon, sumac, garlic, rose, fenugreek, senna, black cumin, cumin, cardamom, chamomile, black seed, rosemary, fennel, frankincense, dandelion, coriander, peppermint, chicory, licorice, nettle, barberry, saffron, jujube, yarrow, mustard, borage, khakshir, lavender, bitter orange, milk thistle, flaxseed, coconut, bitter orange, parsley, cabbage, pumpkin, lettuce, damask rose, alfalfa, sage, and lemon balm have been traditionally used for weight reduction and anti-obesity purposes. Detailed botanical, pharmacological, and ecological information is summarized in Tables 1 and 2.

Table 1: Medicinal and Edible Plants Effective in Weight and Fat Reduction: Common Name, Persian Name, Scientific Name, Family, and Therapeutic Effects

Common Name	Persian Name	Scientific Name	Family	Therapeutic Effect	Ref.
Ginger	Zanjabil	*Zingiber officinale Roscoe*	Zingiberaceae	Weight reduction, anti-inflammatory, metabolism booster	[23]
Thyme	Avishan	*Thymus vulgaris L.*	Lamiaceae	Weight loss, digestive aid, antibacterial	[23,24]
Apple	Sib	*Malus domestica Borkh.*	Rosaceae	Fat reduction, appetite suppressant, antioxidant	[24]
Peanut	Badamzamini	*Arachis hypogaea L.*	Fabaceae	Weight control, source of protein and healthy fats	[23,24]
Celery	Karafs	*Apium graveolens L.*	Apiaceae	Diuretic, body fat reduction	[24,5]
Bunium persicum	Zenian	*Bunium persicum (Boiss.) B.Fedtsch*	Apiaceae	Metabolism enhancer, anti-obesity	[25]
Soy	Soya	*Glycine max (L.) Merr.*	Fabaceae	Blood fat reduction, anti-obesity	[25]
Green tea	Chayesabz	*Camellia sinensis (L.) Kuntze*	Theaceae	Fat burning, anti-obesity	[25,26]
Turmeric	Zardchobeh	*Curcuma longa L.*	Zingiberaceae	Anti-inflammatory, metabolism booster	[26,27]
Black pepper	Felfelsiah	*Piper nigrum L.*	Piperaceae	Metabolism enhancer, fat-burning	[26,27]
Cinnamon	Darchin	*Cinnamomum verum J.Presl*	Lauraceae	Blood sugar regulation, weight loss	[26]
Sumac	Somagh	*Rhus coriaria L.*	Anacardiaceae	Fat reduction, antioxidant	[26,27]
Garlic	Sir	*Allium sativum L.*	Amaryllidaceae	Fat reduction, anti-inflammatory	[26-28]

Rose	Golsorkh	*Rosa damascena Mill.*	Rosaceae	Anti-obesity, calming effect	[27,28]
Fenugreek	Shanbalileh	*Trigonella foenum-graecum L.*	Fabaceae	Fat reduction, blood sugar control	[27,28]
Senna	Sena	*Senna alexandrina Mill.*	Fabaceae	Laxative, temporary weight reduction	[27,28]
Black cumin	Ziresiah	*Nigella sativa L.*	Ranunculaceae	Fat reduction, appetite control	[27,28]
Cumin	Ziresabz	*Cuminum cyminum L.*	Apiaceae	Anti-obesity, digestive aid	[27,29]
Cardamom	Hel	*Elettaria cardamomum (L.) Maton*	Zingiberaceae	Metabolism enhancer, digestive aid	[28]
Chamomile	Babouneh	*Matricaria chamomilla L.*	Asteraceae	Calming, digestive aid	[28,29]
Black seed	Siahdaneh	*Nigella sativa L.*	Ranunculaceae	Fat reduction, anti-inflammatory	[28]
Fennel	Razianeh	*Foeniculum vulgare Mill.*	Apiaceae	Digestive aid, anti-obesity	[28,29]
Rosemary	Rozmari	*Rosmarinus officinalis L.*	Lamiaceae	Metabolism booster, antioxidant	[29]
Frankincense	Kondor	*Boswellia serrata Roxb.*	Burseraceae	Anti-inflammatory, fat reduction	[29]
Dandelion	Ghasedak	*Taraxacum officinale F.H. Wigg*	Asteraceae	Diuretic, weight loss	[29]
Coriander	Geshniz	*Coriandrum sativum L.*	Apiaceae	Weight loss	[29]
Peppermint	Naenadfelfeli	*Mentha piperita L.*	Lamiaceae	Digestive aid, appetite suppressant	[28,29]
Chicory	Kasni	*Cichorium intybus L.*	Asteraceae	Diuretic, lipid-lowering	[28,29]
Licorice	Shirinbayan	*Glycyrrhiza glabra L.*	Fabaceae	Anti-inflammatory, weight control	[30]

Nettle	Gazaneh	*Urtica dioica L.*	Urticaceae	Diuretic, lipid-lowering	[30]
Barberry	Zereshk	*Berberis vulgaris L.*	Berberidaceae	Lipid-lowering, anti-inflammatory	[30,31]
Saffron	Zafaran	*Crocus sativus L.*	Iridaceae	Appetite suppressant, anti-obesity	[30]
Jujube	Anab	*Ziziphus jujuba Mill.*	Rhamnaceae	Lipid-lowering, sedative	[31]
Yarrow	Boumadaran	*Achillea millefolium L.*	Asteraceae	Diuretic, anti-obesity	[31]
Mustard	Khardal	*Brassica juncea (L.) Czern.*	Brassicaceae	Metabolism enhancer, anti-obesity	[31]
Plantain	Barhang	*Plantago major L.*	Plantaginaceae	Fat absorption reduction, laxative	[31]
Descurainia sophia	Khakeshir	*Descurainia sophia (L.) Webb ex Prantl*	Brassicaceae	Anti-obesity, laxative	[31]
Lavender	Ostokhodous	*Lavandula angustifolia Mill.*	Lamiaceae	Sedative, anti-obesity	[31]
Bitter Orange	Baharnaranj	*Citrus aurantium L.*	Rutaceae	Metabolism enhancer, anti-obesity	[31]
Milk Thistle	Kharmaryam	*Silybum marianum (L.) Gaertn.*	Asteraceae	Liver protection, lipid-lowering	[30,31]
Flax	Katan	*Linum usitatissimum L.*	Linaceae	Lipid-lowering, high fiber	[30,31]
Coconut	Nargil	*Cocos nucifera L.*	Arecaceae	Healthy fat, energy source	[31]
Bitter Orange	Portaghaltalkh	*Citrus aurantium L.*	Rutaceae	Appetite suppressant, metabolism enhancer	[31]
Parsley	Jafari	*Petroselinum crispum (Mill.) Nym. ex A.W.Hill*	Apiaceae	Diuretic, digestive aid	[31]

Cabbage	Kalam	*Brassica oleracea L.*	Brassicaceae	Lipid-lowering, high fiber	[31]
Pumpkin	Kadou	*Cucurbita pepo L.*	Cucurbitaceae	Weight reduction, high fiber	[31]
Lettuce	Kahou	*Lactuca sativa L.*	Asteraceae	Appetite suppressant, sedative	[31,32]
Damask Rose	Golmohammadi	*Rosa damascena Mill.*	Rosaceae	Sedative, anti-obesity	[31,32]
Alfalfa	Jounjeh	*Medicago sativa L.*	Fabaceae	Lipid-lowering, high fiber	[31,32]
Sage	Maryamgoli	*Salvia officinalis L.*	Lamiaceae	Anti-obesity, digestive aid	[32]
Lime	Behlimou	*Citrus aurantiifolia (Christm.) Swingle*	Rutaceae	Diuretic, lipid-lowering	[32]

The highest prevalence was observed in the Apiaceae and Fabaceae families, highlighting the significance of medicinal plants and legumes in weight management and overall health.

The Asteraceae and Lamiaceae families were also prominently represented, reflecting their medicinal properties and widespread use in both traditional and modern herbal practices.

Table 2: Overview of Morphology, Habitat, and Environmental Adaptation of Anti-Obesity Medicinal Plants

Scientific Name	Morphological / Type	Ecological / Habitat	Physiological / Life Cycle	Ecological / Environmental Adaptation
Zingiber officinale Roscoe	Rhizomatous plant	Tropical and humid regions	Perennial	Resistant to humidity, prefers fertile soil
Thymus vulgaris L.	Short herbaceous plant	Mediterranean regions	Perennial	Drought-tolerant, adapts to poor soils
Malus domestica Borkh.	Fruit tree	Temperate regions	Perennial	Winter-hardy, requires high sunlight
Arachis hypogaea L.	Annual seed-bearing plant	Warm and semi-warm regions	Annual	Tolerates sandy soils, needs high temperature
Apium graveolens L.	Herbaceous plant	Marshy, moist soils	Biennial	Requires sufficient water, fertile soil
Bunium persicum (Boiss.) B.Fedtsch	Perennial herb	Dry and semi-arid regions	Perennial	Drought-resistant, prefers light soil
Glycine max (L.) Merr.	Climbing herbaceous plant	Temperate and warm regions	Annual	Requires fertile soil and suitable temperature
Camellia sinensis (L.) Kuntze	Evergreen shrub	Humid and mountainous regions	Perennial	Tolerates acidic soils, high humidity
Curcuma longa L.	Rhizomatous plant	Tropical and humid regions	Perennial	Shade-tolerant, prefers moist soil
Piper nigrum L.	Climbing plant	Tropical humid regions	Perennial	Needs support for growth, high humidity
Cinnamomum verum J.Presl	Evergreen tree	Tropical regions	Perennial	Humidity-tolerant, prefers acidic soils

Rhus coriaria L.	Shrub	Dry and semi-arid regions	Perennial	Drought-tolerant, adapts to poor soils
Allium sativum L.	Rhizomatous herb	Temperate regions	Perennial	Fertile soil, requires adequate sunlight
Rosa damascena Mill.	Flowering shrub	Temperate regions	Perennial	Drought and cold-tolerant
Trigonella foenum-graecum L.	Herbaceous plant	Dry and semi-arid regions	Annual	Drought-tolerant, prefers light soils
Senna alexandrina Mill.	Perennial herb	Tropical and semi-arid regions	Perennial	Resistant to poor soils and drought
Nigella sativa L.	Herbaceous plant	Dry and semi-arid regions	Annual	Drought-tolerant, light soil preference
Cuminum cyminum L.	Herbaceous plant	Dry and semi-arid regions	Annual	Drought-resistant, prefers light soil
Elettaria cardamomum (L.) Maton	Rhizomatous plant	Tropical humid regions	Perennial	Shade and humidity-dependent
Matricaria chamomilla L.	Herbaceous plant	Meadows, light soil	Annual	Tolerates poor soil, moderately drought-resistant
Foeniculum vulgare Mill.	Herbaceous plant	Dry and semi-arid regions	Biennial	Light soil-tolerant, full sun required
Rosmarinus officinalis L.	Woody herbaceous plant	Mediterranean regions	Perennial	Drought-tolerant, adapts to poor soils
Boswellia serrata Roxb.	Woody shrub	Warm and dry regions	Perennial	Drought-resistant, grows in poor soils
Taraxacum officinale F.H. Wigg	Herbaceous plant	Meadows, moist soil	Perennial	Light soil-tolerant, adaptable to variable moisture
Coriandrum sativum L.	Herbaceous plant	Light and moist soil	Annual	Full sun, fertile soil preferred

Mentha piperita L.	Creeping herbaceous plant	Moist regions	Perennial	Humidity-tolerant, fertile soil
Cichorium intybus L.	Herbaceous plant	Light soil, meadows	Perennial	Drought-tolerant, adapts to poor soils
Glycyrrhiza glabra L.	Rhizomatous plant	Dry and semi-arid regions	Perennial	Drought-resistant, light soil-tolerant
Urtica dioica L.	Herbaceous plant	Moist and alluvial soils	Perennial	Moisture-tolerant, nutrient-rich soils
Berberis vulgaris L.	Shrub	Dry and semi-arid regions	Perennial	Drought-tolerant, adapts to poor soils
Crocus sativus L.	Tuberous plant	Dry and temperate regions	Perennial	Drought-tolerant, light soil
Ziziphus jujuba Mill.	Tree	Dry and semi-arid regions	Perennial	Drought-resistant, adapts to poor soils
Achillea millefolium L.	Herbaceous plant	Meadows, light soils	Perennial	Drought-tolerant, poor soil-adapted
Brassica juncea (L.) Czern.	Herbaceous plant	Fertile soil	Annual	Full sun, requires sufficient water
Plantago major L.	Herbaceous plant	Moist and swampy soil	Perennial	Tolerates heavy soils and moisture
Descurainia sophia (L.) Webb ex Prantl	Herbaceous plant	Dry and semi-arid soils	Annual	Drought-resistant, light soil
Lavandula angustifolia Mill.	Woody herbaceous plant	Mediterranean regions	Perennial	Drought-tolerant, poor soil-adapted
Citrus aurantium L.	Citrus tree	Tropical and temperate regions	Perennial	Full sun, fertile soil required
Silybum marianum (L.) Gaertn.	Perennial herb	Dry and semi-arid soils	Perennial	Drought-tolerant, poor soil-adapted

Linum usitatissimum L.	Herbaceous plant	Temperate and dry regions	Annual	Light soil-tolerant, drought-resistant
Cocos nucifera L.	Tree	Tropical humid regions	Perennial	Humidity-tolerant, coastal wind-adapted
Petroselinum crispum (Mill.) Nym. ex A.W.Hill	Herbaceous plant	Moist and fertile soil	Biennial	Full sun, adequate water
Brassica oleracea L.	Herbaceous plant	Fertile soil	Perennial	Full sun, sufficient water
Cucurbita pepo L.	Climbing herbaceous plant	Fertile soil	Annual	Moist soil, full sun required
Lactuca sativa L.	Herbaceous plant	Moist and fertile soil	Annual	Full sun, adequate water
Rosa × damascena Mill.	Flowering shrub	Fertile temperate soil	Perennial	Tolerates moderate drought, winter-cold
Medicago sativa L.	Herbaceous plant	Meadows, fertile soil	Perennial	Drought-tolerant, poor soil-adapted
Salvia officinalis L.	Woody herbaceous plant	Mediterranean regions	Perennial	Drought-tolerant, poor soil-adapted
Citrus aurantiifolia (Christm.) Swingle	Citrus tree	Tropical and temperate regions	Perennial	Moisture-tolerant, full sunlight

A schematic representation of plant families and medicinal plants effective against obesity, based on Table 1, is presented.

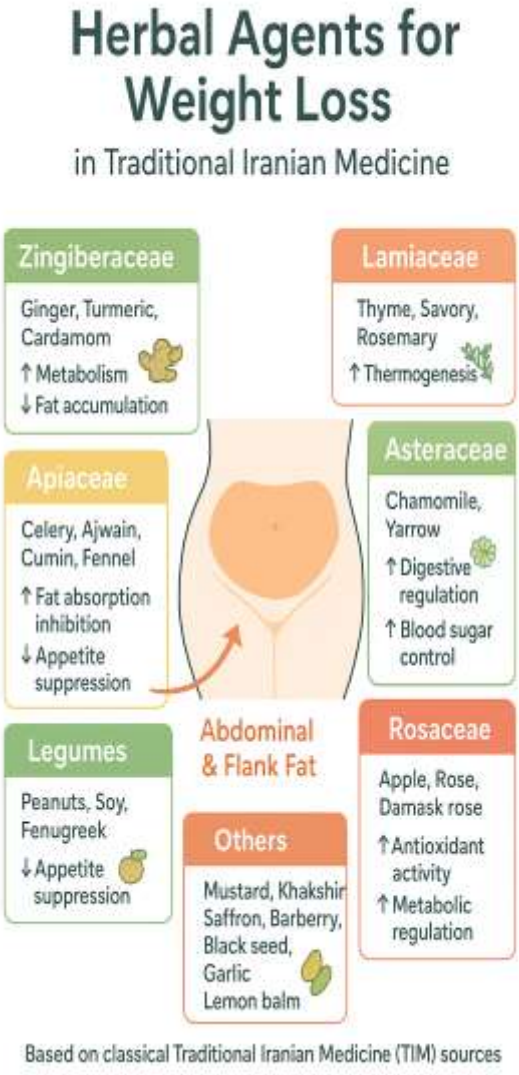

Figure 1: Schematic Representation of Plant Families and Medicinal Plants Effective Against Obesity Based on Table 1

A schematic representation of medicinal plants effective against obesity, categorized according to their mechanisms of action, is presented based on Table 1.

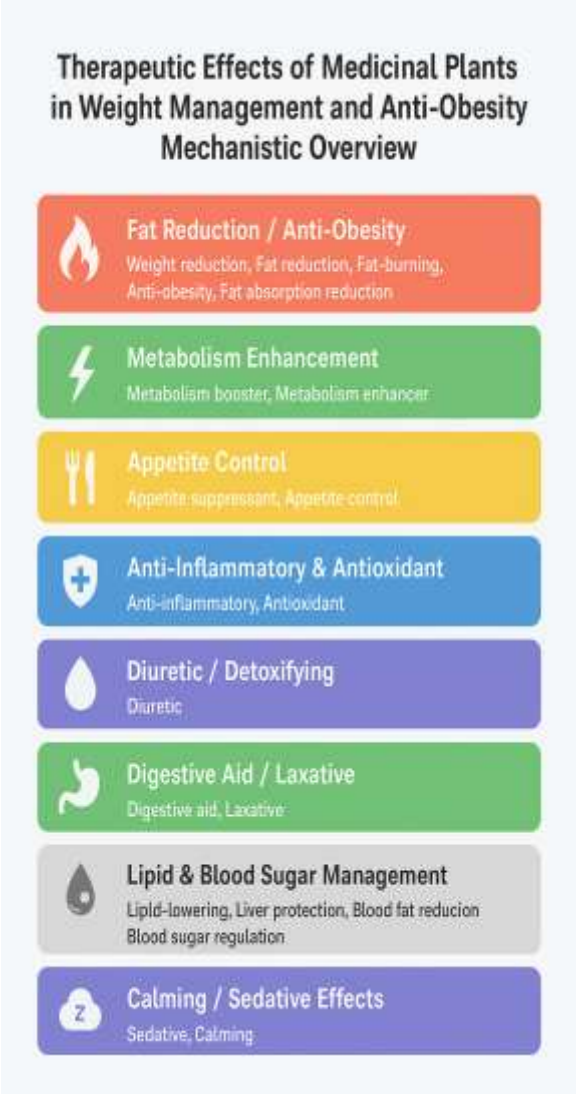

Figure 2: Schematic Overview of Medicinal Plants and Their Anti-Obesity Mechanisms

The majority of plants identified were herbaceous, highlighting an emphasis on short-statured and fast-growing species. Rhizomatous and perennial plants were also notably represented, reflecting the use of species with underground nutrient storage and high durability. Only a small number of tree, shrub, and citrus species were present, indicating a lesser reliance on tall plants within this collection. Specific growth forms, such as climbing, creeping, and tuberous plants, further illustrate the morphological diversity of medicinal and edible plants.

The greatest number of species originated from arid and semi-arid regions, as well as tropical and humid areas, indicating the adaptability of many medicinal plants to harsh environmental conditions and warm climates. Temperate and Mediterranean regions also contributed substantially, reflecting the plant diversity and the use of aromatic and medicinal species in these habitats. The presence of plants in humid regions, plains, and fertile soils underscores the importance of soil quality and moisture in the growth of herbaceous and medicinal plants.

Most of the plants (70%) are perennial, highlighting an emphasis on long-lived and sustainable species. Annual plants (22%) are primarily valued for their rapid growth cycles, seed production, or short-term medicinal use. Biennial plants (8%) are the least common, yet they play an important role in both agricultural and medicinal cycles.

Most of the plants are drought-tolerant and capable of growing in nutrient-poor soils, highlighting the importance of adaptation to harsh environmental conditions.

Discussion

Obesity and overweight represent some of the most pressing public health challenges in the contemporary world, with prevalence rates having risen dramatically over the past few decades. This condition not only affects physical appearance and overall quality of life but also significantly increases the risk of chronic metabolic disorders, including type 2 diabetes, hypertension, cardiovascular diseases, and certain forms of cancer. Overweight and obesity typically arise from a complex interplay of genetic predispositions, lifestyle factors, unbalanced diets, and physical inactivity. Addressing these conditions requires a multifaceted approach, encompassing dietary modifications, regular physical activity, environmental management, and, in some cases, complementary or pharmacological interventions.

Alongside conventional strategies, natural and plant-based approaches, particularly herbal anti-obesity agents employed in traditional Iranian medicine, offer a potentially safe and effective adjunct for weight management and prevention. Evidence from several studies suggests that certain medicinal plants can influence metabolism and hormonal regulation, thereby promoting reductions in body weight and fat mass. For instance, research has shown that the consumption of plants such as fava bean, hibiscus, celery, soy, and cinnamon may support weight loss and metabolic improvement. These effects are mediated through mechanisms including appetite suppression, enhanced metabolic rate, improved carbohydrate and lipid absorption, leptin regulation, and mitigation of hypoglycemia. Such outcomes have been particularly corroborated in animal studies and, to some extent, in human trials, highlighting the considerable potential of these botanicals in managing obesity and related metabolic disorders [33].

Nonetheless, despite the popularity of herbal remedies and supplements like Garcinia cambogia, Hoodia gordonii, green and black tea, bitter orange, capsaicin-containing plants, psyllium, glucomannan, Cissus quadrangularis, Irvingia gabonensis, fenugreek, and yohimbine, clinical evidence supporting their efficacy remains limited. Most research to date has been restricted to animal experiments or small human cohorts, leaving the definitive assessment of both effectiveness and safety unresolved. Consequently, rigorous, large-scale, and controlled clinical trials are necessary to substantiate their use in weight reduction [34].

Specific medicinal plants including *Crocus sativus L., Zingiber officinale, Cinnamomum verum, Matricaria chamomilla, Aloe vera L., Anethum graveolens, Portulaca oleracea, Coriandrum sativum L., Trigonella foenum-graecum L., and Nigella sativa L.* have been associated with lipid-regulating properties that support weight reduction and combat obesity [35]. Other studies have highlighted plants such as Atrafil saghir, cinnamon, soy, celery, senna, hibiscus, black cumin, phytosterols, Orchis root, Colpura, fenugreek, and peanut as potential therapeutic agents for obesity management [36].

Historically, pharmacological interventions including phenolphthalein, ethylamphetamine, katyn, and clobenzorex were employed for weight reduction but are now banned in regions such as the United States, the European Union, and Ukraine due to severe adverse effects. Modern anti-obesity drugs, including orlistat, lorcaserin, phentermine, topiramate,

bupropion-naltrexone, liraglutide, sibutramine, rimonabant, and metformin, vary in efficacy, legal status, and side-effect profiles, with most requiring controlled administration under legal supervision. Ukraine, aligning with EU standards, ensures the quality and safety of these medications. The development of new therapeutics that combine high efficacy with improved patient tolerability remains a critical need in obesity management [37].

Ethnobotanical surveys in regions such as Bushehr, Sistan and Baluchestan, Hormozgan, Khuzestan, Fars, and Kerman have documented the use of a wide array of medicinal plants for lipid regulation and metabolic support. These include *Anethum graveolens L., Phoenix dactylifera L., Cichorium intybus L., Silybum marianum L. Gaerth., Sinapis arvensis L., Capparis spinosa L., Terminalia arjuna W. & A., Plantago psyllium* L., and others, reflecting a rich tradition of botanical approaches to metabolic health [38, 39].

Conclusion

This review underscores the diversity of medicinal plants highlighted in traditional Iranian medicine as potential anti-obesity agents. Through mechanisms such as metabolic enhancement, fat absorption reduction, appetite control, and improved gastrointestinal function, these botanicals may contribute meaningfully to weight and lipid management. While traditional knowledge and preliminary scientific studies are promising, definitive evidence regarding efficacy and safety requires extensive, controlled clinical trials. Integrating these herbal interventions with lifestyle modification and dietary adjustments offers a comprehensive and safe strategy for obesity prevention and treatment. Employing plant-based agents as adjuncts in weight management programs may also mitigate the adverse effects associated with synthetic drugs. Ultimately, rigorous scientific documentation and the promotion of traditional Iranian medical knowledge can facilitate the development of natural, effective solutions for combating obesity.

Statements and Declarations

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Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki.

Consent to participate

Informed consent was obtained from all individual participants included in the study.

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