

## A Review on the Therapeutic Potential of "Millets" in the Management of "Sthaulya (Obesity): An Ayurvedic Perspective

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### ABSTRACT

Obesity is a global problem that shortens life expectancy and may result in partial disability. A diet with fewer meals results in insufficient energy and food intake. Even though there are many treatment options for obesity, it is rapidly rising to the top of the list of non-communicable diseases that impact most people during their working years. The battle against the obesity pandemic heavily relies on diet and lifestyle. India grows a vast range of crops, including millets like Yava, Jwar, Bajra, Chana, and Makka, which are eaten to stay healthy and avoid obesity. Ayurvedic scholars and traces of modern dietetics with an emphasis on obesity..

**Keywords:** Ayurveda, Millets, Obesity, Sthoulya, Therapeutic Potential, Prevention.

### INTRODUCTION

Ayurveda combines the art and science of living. It teaches vital information about life itself in addition to being an ancient Indian medicinal science. Ayurveda is unique in that it emphasizes the importance of social, mental, physical, and spiritual well-being. A Santarpanjanya Vyadhi is Sthaulya.<sup>1</sup> Two In recent years, obesity has become a pandemic. Modern eating habits and lifestyles are often blamed for its rise. Obesity increases the risk of many non-communicable diseases, such as diabetes, heart disease, cancer, and hypertension.<sup>2</sup> Lack of exercise, poor eating habits, a dysfunctional lifestyle, addictions, and a competitive perspective on the material world have all been linked to numerous health morbidities. The most common one is obesity. The five health recommendations for diet and exercise eating breakfast, eating fruit and vegetables, drinking milk or yoghurt, exercising moderately to vigorously, and limiting television viewing are not followed by most teenagers. Abdominal obesity was associated with binge-watching television and male gender.<sup>3</sup>

Apatarpana Chikitsa (depleting therapy), which involves dietary changes, exercise, Panchakarma treatments, and the use of Medohara medications, is the focus of Ayurvedic treatment for Sthaulya. The natural qualities of millets directly counteract the pathological features of obesity, making them an appropriate nutritional component.

Concept of Sthaulya in Ayurveda: The prefix "Sthu" with the suffix "Ach," which denotes thick, solid, strong, enormous, or bulky, is where the word "Sthoola" originates. They move more strangely and lose their desire as a result of the excessive deposition of Meda and Mamsa Dhatu in their bodies, especially in the regions surrounding their buttocks, tummies, and breasts (Utsaha). "Atisthula" is the name of this personality type. The 29th Adhyaya of the Charaka Sutra refers to the state (Bhava) of Sthula as "Sthaulya." The name "Sthula" describes a person whose body is big and bulky due to prolonged growth, especially in the Udaradi (Abdominal) area. <sup>4</sup>

Ati Madhura Ahara (excessive sweet foods), Ati Snigdha Ahara (fat-rich foods), Guru Ahara (heavy-to-digest foods), excessive dairy consumption, sedentary lifestyles, day sleep (Divaswapna), psychological comfort and lack of stress, genetic predisposition (Beeja Dosha), and overnutrition are the main causes of Sthoulya.

**Cause of obesity:**<sup>5,6,7</sup>

Although obesity involves a variety of hereditary or extrinsic causes, it is currently categorized as a metabolic disease due to changes in modern living. Ayurveda states that consuming too many fatty and sugary meals, relaxing all day, and not exercising are the main causes of obesity. Obesity is caused by a number of reasons, including-

- 1) **An unhealthy lifestyle:** Physical inactivity is a major factor in the rise of obesity. Addiction to alcohol, the internet, the workplace, coercion, or aging can all lead to physical inactivity. Long periods of sitting in comfortable chairs are common among businesses, government employees, and most white-collar workers. As a result, obesity is becoming more common.
- 2) **A psychological component:** Emotional illnesses may be brought on by stress from the social and psychological environment. Numerous commonplace irritations, including fighting, arguing, family gatherings, marriages, deaths, long-distance travel, navigating heavy traffic, etc., can cause stress. Weight growth is either directly or indirectly caused by these factors.
- 3) **Diet:** Obesity has become increasingly common in recent decades, which may be more related to overeating than to physiological needs, a tendency to eat fast, and increased intake of high-fat meals and sugar-filled beverages. According to Ayurveda, the two main causes of sthoulya roga are ati sampurana (consuming too much food in a single meal) and adhyashana (consuming food frequently before digesting a previous meal).
- 4) **Gender and Age:** People in their middle years are more likely to be fat, but obesity can occur at any stage of life. Adolescent and middle-aged females suffer more than males due to hormonal changes during puberty, menstruation, pregnancy, menopause, and hormonal deficits of the thyroid, pituitary, and ovarian glands. Although obesity is a global problem, certain racial groups such as South Germans, Africans, Dutch, South Italians, and Ceylonese are more prone to it than others.
- 5) **Social and economic standing:** The body stores more fat than it should because to overeating and lower energy expenditure. People from higher socioeconomic classes are often seen to want more luxurious and sedentary lifestyles. Obesity is therefore much more prevalent among them.
- 6) **Drug induced:** Anti-epileptic, corticosteroid, oral contraceptive pill, antidepressant, hypoglycemic antihypertensive medication, etc., long-term use causes fat.

**Etiology of sthoulya (Obesity) in Ayurveda:**

The causes of sthoulya (obesity) are described in great detail in our ancient Ayurvedic writings. These include achintanam (not thinking much), divaswapna (sleeping during the day), harshanityam (always being happy), shleshmaj aahar-vihar sevana (diet and lifestyle that increases fatty tissues), atisampurana (consuming too much food that is difficult to digest), aayavaya (not having sex), avyayama (not exercising), and beejaswabha (hereditary).<sup>8</sup>

**Clinical features:**

The following conditions are known as "Ashta Doshas" in Ayurvedic literature, and an obese person always fits into one of them. These include Javoparodha, who has trouble moving, Krichravayava, who has trouble having sex, Dargandhya, who smells horrible, Atisweda, who perspires excessively, Atikshuda, who is overly hungry, and Atitrishna, who thirsts excessively. Ayushohrasha (shortening of life span) is the most difficult of these. Klaibya (impotence), Budhimoha (mental hallucinations), and Pramiliika (dropsy) are a few notable consequences of obesity.

**Management of Obesity-**

Ayurveda encourages a holistic approach to properly treat any ailment. The three previously mentioned elements spiritual, psychological, and physical are prioritized in the treatment of illness. Reducing food intake and increasing energy expenditure are the cornerstones of treating obesity. Ayurvedic treatment is currently recognized as the best option for people suffering from the sthoulya cure (obesity).<sup>9</sup>

**Millets: Historical Background and Nutritional Importance**

Among the earliest cereal grains that humans have ever cultivated are millets. They are described in ancient agricultural and nutritional practices and have been consumed for thousands of years in India. Because of their remarkable nutrient richness, millets are frequently referred to as "nutri-cereals."

Pearl millet (*Pennisetum glaucum*), Finger millet (*Eleusine coracana*), Foxtail millet (*Setaria italica*), Barnyard millet (*Echinochloa frumentacea*), Kodo millet (*Paspalum scrobiculatum*), Little millet (*Panicum sumatrense*), Proso millet (*Panicum miliaceum*), and Sorghum (*Sorghum bicolor*) are the main millets.

In contrast to refined wheat and polished rice, millets keep their bran layer, which is rich in phytonutrients, vitamins, minerals, and dietary fiber. They are especially helpful in the fight against obesity and related metabolic disorders because of their high nutritional value.

**Important millets that are used to treat obesity:**

**1. Yava (Barley)**

**Botanical name-***Hordeum Vulgare*

**Family-**Poaceae

Yava has added Sushruta in Mudgadi Varga and Sukadhanya Varga in Caraka Samhita. Yava is mentioned by Caraka in Swedopaga Mahakashaya, Chardinigrahana, and Shramahara. According to Ayurveda, Yava's pharmacodynamics include Ruksha (dry), Sheeta Virya (cold in potency), Laghu (light in digestion), Madhura (sweet), and Kashaya (astringent taste). It also aggravates Vata and causes more feces. Additionally, it strengthens the body and relieves Kaphaja diseases.<sup>10</sup> When combined with Amalaki Churna, it is most commonly known as Stanyavardhaka, Medohara (aids in fat reduction). According to the National Health and Nutrition Examination Survey, barley's potassium, calcium, and magnesium content can help decrease blood pressure naturally. Barley's high fiber content helps lower blood cholesterol, lower the risk of heart disease, and aid in weight loss for those who are obese.<sup>11</sup>

**Jwar (Great millet)**

**Botanical name-***Sorghum Vulgare*

**Family-** Poaceae

Jwar calms Vata and Kapha dosa and possesses attributes similar to Madhura and Kashaya in rasa, Laghu, and Sheeta Virya. Important elements like iron, calcium, potassium, and phosphorus can be found in jwar. It has good levels of riboflavin and thiamine. Additionally, millet has high levels of phytochemicals that have been shown to have the ability to reduce obesity. Jowar is said to also be beneficial to the heart. in addition to being obese.<sup>12</sup>

**Bajra (Pearl millet) -**

**Botanical name-***Pennisetum glaucum*

**Family-** Poaceae

Bajra calms Vata and Kapha Dosha and possesses attributes similar to Madhura in Rasa, Ruksha, and Usna Virya.<sup>13</sup> Its reduced glycemic index compared to wheat and rice is well known. Magnesium derived from millet can lessen the impact of heart attacks. Bajra contains niacin, which reduces cholesterol. Pearl millet is mostly starchy since it has 73 grams of carbs for every 100 grams of bajra. It is an essential source of B complex vitamins, which are mostly present in the outer bran layer of grains.<sup>14</sup>

**Kodrava (Kodo millet) -**

**Botanical name-***Paspalum scrobiculatum*

**Family-** Poaceae

Kodrava has included *Sukadhanya Varga* in Caraka Samhita. It qualities like Madhura, Kashaya in Rasa, laghu, Ruksha, in Guna, Sheeta Virya , katu in Vipaka and pacifies Pitta and Kapha Dosha. It is beneficial for the treatment of obesity because of its lekhan karma. <sup>15</sup>

**Puranashali (Rice)-**

**Botanical name-***Oryza sativa*

**Family-** Poaceae

Puranashali has included in *Sukadhanya Varga* by Acharya Caraka in Caraka Samhita. It calms Pitta and Kapha Dosha and has attributes like Madhura in Rasa and Kasaya in anurasa, laghu, Ruksha, in Guna, Sheeta Virya, and Madhura in Vipaka. It can be used to treat obesity because of its lekhan karma. <sup>16</sup>

**Makka (Corn millet)-**

**Botanical name-***Zea mays*

**Family-** Poaceae

Makka has included *Sukadhanya Varga* in Caraka Samhita. It calms Pitta and Kapha Dosha and has attributes such as Madhura in Rasa, laghu, Ruksha in Guna, Sheeta Virya, and katu in Vipaka. It is helpful in treating obesity because of its lekhan karma.<sup>17</sup>

**Shyamaka (Barnyard millet)-**

**Botanical name-***Echinochloa esulenta*

### Family- Poaceae

Shyamaka has included *Dhanyakvarga Varga* in Caraka Samhita. It calms Pitta and Kapha Dosha and possesses attributes like Madhura, Kashaya in Rasa, laghu, Ruksha in Guna, Sheeta Virya, and katu in Vipaka. It helps treat obesity because of its Sangrahi and Vishaghna karma. <sup>18</sup>

**Kulattha** (Horse gram) -

**Botanical name- Phaseolus radiates**

### Family- Fabaceae

Kulattha has included Shami Dhanya Varga in Caraka Samhita. It calms Kapha-Vatahara and possesses attributes like Kashaya in Rasa, Laghu, Sara in Guna, Ushna Virya, and Katu in Vipaka. It can help manage obesity because of its Vidahi, Swedasangrahaka, and Krimihara karma. <sup>19</sup>

**Mudga** (Green gram)-

**Botanical name- Phaseolus radiatus**

### Family- Fabaceae

Mudga has included Shami Dhanya Varga in Caraka Samhita. It calms Kaphahara and Pittahara and possesses attributes such as Madhura, Kashaya in Rasa, Laghu, Ruksha, Vishada in Guna, Sheeta Virya, and Madhur in Vipaka. It is beneficial for treating obesity because of its Grahi and Lekhan karma. <sup>20</sup>

**Adhaki** (Pigeonpea, red gram)-

**Botanical name- Cajanus cajan**

### Family- Fabaceae

Adhaki has included Shami Dhanya Varga in Caraka Samhita. It calms Kapha-Vatkara and has attributes like Madhura, Kashaya in Rasa, laghu, Ruksha in Guna, Sheeta Virya, and katu in Vipaka. It helps reduce obesity because of its ruksha guna and vatakara karma. <sup>21</sup>

**Chanadaal** (Bengal gram) -

**Botanical name- Cicer arietinum**

### Family- Fabaceae

Chanadaal has included Shami Dhanya Varga in Caraka Samhita. It calms Kaphakara, Pittahara, and Vatavardhak and has attributes such as Kashaya in Rasa, Laghu, Ruksha, in Guna, Sheeta Virya, and Katu in Vipaka. It is effective in treating obesity because of its vatavardhak karma Laghu, ruksha guna. <sup>22</sup>

### Millets' Nutritious Makeup in Relation to Obesity

Millets are abundant sources of: Magnesium, phosphorus, potassium, iron, calcium, zinc, complex carbohydrates, resistant starch, proteins, vital amino acids, polyphenols, flavonoids, antioxidants, and B-complex vitamins. Compared to polished rice, millets have a far higher fiber content. Fiber improves intestinal function, decreases calorie intake, increases fullness, and slows digestion. As a prebiotic, resistant starch enhances the makeup of the gut microbiota, which is becoming more widely acknowledged as a crucial component in the treatment of obesity.

### Therapeutic Potential of Individual Millets

| Millet                      | Therapeutic Potential in Obesity (Sthaulya) Management                                                                                                       |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pearl Millet (Bajra)</b> | Rich in protein and dietary fiber; increases satiety, reduces hunger, and improves lipid metabolism, thereby aiding weight management.                       |
| <b>Finger Millet (Ragi)</b> | Delays gastric emptying, possesses strong antioxidant activity, and is rich in calcium and polyphenols, which support weight reduction and metabolic health. |
| <b>Foxtail Millet</b>       | Enhances insulin sensitivity and glycemic control, helping to reduce metabolic disorders commonly associated with obesity.                                   |
| <b>Barnyard Millet</b>      | Has a very low glycemic index and high dietary fiber content, making it beneficial for individuals with obesity and diabetes.                                |
| <b>Kodo Millet</b>          | Contains significant amounts of dietary fiber and polyphenols that exhibit anti-obesity and lipid-lowering effects.                                          |
| <b>Little Millet</b>        | Promotes satiety, reduces overall calorie intake, supports digestive health, and contributes to body weight regulation.                                      |
| <b>Sorghum (Jowar)</b>      | Rich in resistant starch and bioactive phytochemicals that improve body composition and help reduce obesity.                                                 |

## Mechanisms of Anti-Obesity Action of Millets

Through a variety of physiological and biochemical processes, millets help regulate obesity. Their high fiber content reduces energy intake, inhibits overeating, and stimulates the release of hormones that control hunger. Complex carbs minimize fat formation by ensuring moderate glucose release and fewer insulin spikes. Polyphenols lower inflammatory cytokines linked to obesity and prevent adipogenesis. Antioxidants guard against metabolic malfunction brought on by oxidative stress. Resistant starch boosts fat oxidation, improves insulin sensitivity, and diversifies gut microbiota. According to Ayurveda, these results are associated with the acts of Deepana, Pachana, Lekhana, Medohara, and Kapha-Shamaka, which in turn treat the underlying pathology of Sthaulya.

## Combining Ayurveda with Contemporary Nutrition

Ayurveda places a strong emphasis on customized food planning based on Agni, Dosha, and medical conditions. Because millets are inherently Laghu, Ruksha, and Kapha-Medohara, they correspond very well with Ayurvedic prescriptions for obesity. These conventional ideas are supported by contemporary nutritional science, which shows their high fiber content, low glycemic index, and advantageous metabolic effects.

Therefore, millet-based dietary treatments are a great way to combine evidence-based nutritional research with traditional Ayurvedic knowledge. Sustainable obesity treatment and preventive healthcare can greatly benefit from such integration.

## Millets in Sthaulya (Obesity)

### Ancient Grain, Timeless Solution

In Ayurveda, Sthaulya (Obesity) is a condition of meda vriddhi (excess fat accumulation) caused by sedentary lifestyle, improper diet and kapha imbalance. Millets help restore balance, promote lekhana (scraping of excess fat) and support healthy weight management.

#### Why Millets Help in Sthaulya (Obesity)

- High in Dietary Fiber** – promotes satiety and reduces cravings
- Low Glycemic Index** – helps control blood sugar & insulin levels
- Light to Digest (Laghu)** – reduces ama (toxins) and improves metabolism
- Lekhana (Scraping) property** – helps reduce meda (excess fat)
- Rich in Antioxidants & Nutrients** – supports overall health and energy balance

#### Millets Beneficial in Sthaulya

| Bajra (Pearl Millet)                                                      | Jowar (Sorghum)                                                               | Ragi (Finger Millet)                                                  | Kodo Millet (Varagu)                                             | Foxtail Millet (Kangni)                                                   | Little Millet (Samai)                                                  |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|
| Ushna veerya, kaphahara, improves digestion and reduces fat accumulation. | High fiber, gluten-free, keeps you full longer and aids in weight management. | Rich in calcium & fiber, strengthens body and helps in fat reduction. | Easy to digest, helps in detoxification and supports metabolism. | Low calorie, high fiber, helps control appetite and supports weight loss. | Nutritious & light, helps in balancing kapha and reducing body weight. |

#### How to Include Millets in Diet

- Use millets instead of rice or wheat.
- Prepare light and balanced meals like millet khichdi, upma, dosa, roti or salads.
- Combine with vegetables, legumes and spices like ginger, cumin, turmeric for better digestion.
- Eat mindfully, avoid overeating and lead an active lifestyle.

#### Ayurvedic Perspective

Millets pacify kapha, improve agni (digestive fire), reduce ama and support lekhana (fat scraping) which is essential in the management of Sthaulya (Obesity).

#### Choose Millets, Choose Health

For a light body, active mind and balanced life.

"Let food be your medicine – Millets are nature's gift for a healthy, happy you."

## DISCUSSION-

Ayurvedic writings state that the body develops Kapha Bhuishtha Dosha vriddhi as a result of the union of Kapha and Meda Sadharmi Amarasa, which contain etiological components. This naturally leads to Agni vikruti, which in turn causes the production of Ama. By creating Medodhatwagni-mandya, this Ama has a direct impact on Meda Dhatu and causes Meda to develop and accumulate. Vata's Margavrodha arises from Medovaha Sroto Sanga, which is caused by vitiated Kapha and Meda. This vitiated Vata circulates throughout the body, but especially in the Koshta, and ultimately results in Jathragni Sandhukshana, which gives rise to Ahara's Shighra Jarana and

Kshudhaadhikya. *Because of Medodhatwagni Mandhya, the Medodhatwagni's ability to digest Medamasa is impaired, resulting in the development of Apakwa Meda, which cannot nourish the Utter Dhatu. The Ama Meda accumulates in Sarvanga, especially in the Sphig-Udar-Stana areas, leading to Sthaulya. According to Ayurveda, obesity can be prevented and treated with the help of Ahara, Vihara, Dinacharya, Ritucharya, Yoga, and Rasayana. For Sthaulya (Obesity), Indian millets are essential. Millets have laghu guna and lekhan karma, which help people lose extra body fat.*

## CONCLUSION-

Sthaulya is a complicated metabolic condition brought on by impeded Agni, Srotorodha, Meda Dhatu buildup, and disturbed Kapha Dosha. Long-term dietary and lifestyle changes are necessary for successful control. Millets' special blend of Ayurvedic and nutritional qualities makes them incredibly therapeutically promising. The pathophysiology of Sthaulya is immediately countered by its Laghu, Ruksha, Lekhana, Deepana, and Medohara characteristics, and their high dietary fiber, antioxidant, polyphenol, and resistant starch content promotes good weight control and metabolic regulation. Treatment is not as good as prevention. It is important to encourage people who are obese or at risk for obesity to follow a balanced diet and avoid foods high in calories and sugar. Long-term weight control and maintaining good health must be prioritized over rapid weight loss. As previously mentioned in the Charaka Samhita, Sushruta Samhita, and Vagbhata, cereals should be eaten daily in a certain amount to support health and prevent conditions like Medo roga (obesity). These millets mudga, kulattha, uddalaka, kodrava, syamaka, Yava, Jwar, bajra, chana, and makka are utilized to maintain health and fend against illness. Anyone who regularly engages in yoga, paranyam, and a balanced diet will prevent their healthy bodies from developing excess weight.

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