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Integrative Approach to Weight Loss: The Impact of *Yogasana* Practice and Diet in Obesity

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ABSTRACT

This case report explores the weight loss journey of a 26-year-old female achieved through an integrative approach combining *Yoga*, intermittent fasting, and diet correction. Starting with a BMI of 28.4 kg/m² and weight of 71 kg, the patient underwent a 10-month program designed to improve physical fitness and metabolic health. The intervention resulted in measurable improvements, including an 18.17% reduction in weight, a 17.96% decrease in BMI, and a 15.38% improvement in HbA1c levels. The study demonstrates the effectiveness of a multidisciplinary approach in managing obesity and associated metabolic conditions.

Key words: *Obesity, Yogasana, Intermittent fasting, Integrative approach, Diet correction*

INTRODUCTION

Obesity is a growing public health concern worldwide, associated with a range of comorbidities, including cardiovascular diseases, diabetes, and metabolic syndrome. The global prevalence of obesity has nearly tripled since 1975, making it a major focus of modern healthcare interventions. While hundreds, if not thousands, of weight-loss strategies, diets, potions, and devices have been offered to the overweight public, the multi-factorial aetiology of overweight challenges practitioners, researchers, and the overweight themselves to identify permanent, effective strategies for weight loss and maintenance. The percentage of individuals who lose weight and successfully maintain the loss has been estimated to be as small as 1 to 3 per cent.[1] *Yoga*, a centuries-old practice rooted in holistic wellness, has gained significant attention for its role in weight management. Studies show that *Yoga* not only improves physical fitness but also reduces stress, which is a contributing factor to obesity through mechanisms related to overeating and poor metabolic control. Specific *Yoga* practices such as *Surya Namaskar* have been associated with improving body composition and metabolic health, enhancing fat loss and insulin sensitivity.[2] Intermittent fasting, particularly the 16:8 regimen, has also emerged as an effective dietary approach to weight management. This method promotes weight loss by inducing caloric restriction and improving metabolic flexibility, allowing the body to utilise fat as a primary energy source during fasting windows. Several studies suggest that intermittent fasting can improve insulin sensitivity, reduce body fat percentage, and lower blood pressure in individuals with obesity.[3] The case highlights the importance of a multidisciplinary lifestyle intervention in achieving sustainable weight loss and improved metabolic health.

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CASE PRESENTATION

A 26-year-old female doctor from Maharashtra, who was struggling with weight management and has been

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trying to lose around 10 kilograms for the last 4-5 years. She had tried various weight loss methods, including going to the gym for 2-3 months, but did not observe notable progress and thus refrained from going. She had trouble making good nutritional choices and led a high-stress life. Her quality of life is affected by her weight and contributes to a sense of poor self-esteem, and loss of enthusiasm exacerbated by a long history of failed attempts at long-term weight loss. She had a normal weight and after puberty hit, she started gaining weight, and meanwhile, she been administered steroids for long periods to cope with dengue's effects. And that contributed to her weight gain.

Medical History: Long-standing obesity, family history of obesity, hypothyroidism and diabetes.

Clinical Findings

The patient weighed 71 kg at the initial assessment, with a BMI of 28.4 kg/m². Blood pressure was measured at 124/82 mmHg, and the waist-to-hip ratio was calculated as 0.86. Additional measurements included a neck circumference of 15 inches and a thigh girth of 24.5 inches. Blood glucose levels were recorded as HbA1c 5.2%, fasting blood sugar at 86 mg/dl, and postprandial at 110 mg/dl thyroid levels measuring as T3, Total, Serum – 125 ng/dL; and T4, Total, Serum - 7 mcg/dL; TSH – 1 mU/L

Initial Visit: 25 May 2023 - Presented with Obesity

Rationale

The integrative approach in this study is particularly noteworthy due to its innovative structure. Traditionally, *Yogasana* interventions do not incorporate specific sets and repetitions of *Yogasana.* However, this study introduces a novel aspect by utilizing defined sets and repetitions tailored to the participant, marking a significant departure from the usual practice of prescribing a fixed *Yogasana* protocol throughout the intervention. Moreover, the diet was designed not only with a calorie-deficit focus but also by considering the *Ayurvedic* properties of food, such as *Guru* (heavy) and *Laghu* (light). While keeping caloric intake within limits, the dietary plan respected these properties to support the overall health of participant. A controlled calorie intake ensured the diet did not exceed the body's energy requirements. Additionally, while intermittent fasting typically allows flexibility in food choices during the 8-hour window, this study imposed structured food restrictions. This approach ensured that the dietary regimen complemented the therapeutic goals of the intervention, combining traditional wisdom with modern nutritional science.

METHODOLOGY

This case report involved a 10-month intervention aimed at achieving weight loss and improving metabolic health through a multidisciplinary approach that combined *Yoga*, intermittent fasting, and dietary modifications.

Study Design

The subject of this case study is a 26-year-old female with a BMI of 28.4 kg/m² and a history of challenging weight loss attempts. The intervention was personalized to her needs, considering her medical history, which included obesity, hypothyroidism, and a family history of diabetes.

Intervention Protocol

The intervention comprised three main components:

A) *Yoga* Routine: The patient followed a structured 45-minute *Yoga* regimen, performed six days a week. Each day targeted different muscle groups and included core strengthening, forward and backward bending, and flexibility exercises. The seventh day was designated for rest and fasting.

Table 1: Details of *Yoga* intervention in a week

SN	Day	*Yoga* Routine
1.	**Monday**	Jumping Jacks – 25 repetitions X 2 sets *Ashtanga Suryanamaskar* type B X 3 sets **Forward Bending** - *Hastapadasana* – 40 sec. X 3 sets - *Shashankasana* (baby pose) – 45 sec. X 3 sets - *Paschimottanasana* – 25 sec. X 3 sets

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		- *Janushirshasana* – Right. & Left. each - 30 sec. X 3 sets - *Karnapidasana* - 25 sec. X 2 sets 2 hand hold Plank - 25 sec. X 3 sets Ragdoll pose - 40 sec. X 2 sets
2.	**Tuesday**	Jumping Jacks 30 X 2 Alternate toe touch - 30 on each side *Ashtanga Suryanamaskar* type B X 3 **Backward Bending** - *Urdhva Hastottanasana* – 25 sec. X 4 - *Ardhachakrasana* – 30 sec. X 3 - *Ushtrasana* – 30 sec. X 2 - *Kapotasana* - 15 sec. X 2 - *Parshvakonasana* - 30 sec. X 2 Side Plank, Right & left - 15 sec. X 2 Sit-ups - 5 X 2
3.	**Wednesday**	Jumping Jacks – 30 X 2 Alternate toe touch - 30 X 2 *Ashtanga Suryanamaskar* type B – X 3 **Side Bending** - *Ardhakatichakrasana* Rt. & Lt. – 25sec. X 3 on each side. - Trunk Twists - 20 sec. X 10 on each side - *Marichayasana* - 20 sec. X 2 on each side - Thigh Squats - 15 X 2 Pushups - 5 X 2 Sitting trunk Twists 20 on each side
4.	**Thursday**	Jumping Jacks – 30 X 2 Alternate toe touch - 30 X 2 *Ashtanga Suryanamaskar* type B – X 3 **Core Strengthening** - *Uttanpadasana* 45^0 (degree) – 15 sec. X 2 - *Sarvangasana* – 30 sec. X 2 - *Halasana* – 20 sec. X 2 - *Matsyasana* - 20 sec. X 2 - *Virasana* & *Virbhadrasana* Right & left on each side - 35 sec. X 4 Supine trunk twists - 30 X 2
		Supine trunk twists (type 2) - 40 sec. X 2 on each side
5.	**Friday**	Jumping Jacks – 30 X 2 Alternate toe touch - 30 X 2 *Ashtanga Suryanamaskar* type B – X 3 **Prone Postures** - *Naukasana* – 20 sec. X 2 - *Shalabhasana* – 15 sec. X 3 - *Bhujangasana* – 40 sec. X 2 - *Marjar Mudra* (Cat Pose) - 60 sec. X 3 - *Gau Mudra* (Cow Pose) - *Navasana* - 20 sec. X 2
6.	**Saturday**	Jumping Jacks – 30 X 2 Alternate toe touch - 30 X 2 *Ashtanga Suryanamaskar* type B – X 3 **Core exercises** - *Purvottanasana* – 25 sec. X 2 - *Parvatasana* – 45 sec. X 2 - *Ashwasanchalana* Right & Left each – 45 sec. X 2 - *Virbhadrasana* - 45 sec. X 2 - Pushups – 5 X 2 *Purna Chakrasana* - 20 sec. X 3

Though *Yogasana* Practice was mandatory, taking proper rest during menstruation was advised. *Yogasana* was supposed to be paused for 3-4 days during menstrual flow while maintaining a consistent diet throughout the intervention period.

B) Intermittent Fasting: The patient was given a fasting regimen. She could eat two large meals during the day and a small meal during two other periods. She followed a 16-hour fast, starting from 7:00 PM and ending at 11:00 AM the next day, and from 11:00 AM to 7:00 PM she was allowed to eat around three meals. On rest days from *Yoga*, a full-day fast was observed, with only one large meal consumed in the evening,

C) Dietary Modifications: The patient was directed to restrict her intake of processed foods, soda, and sugary snacks in the short and long term. The changes were implemented gradually, and she was supported significantly during the process.

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A calorie deficit diet was implemented, with the daily calorie requirement estimated at **1775 calories** (based on 25 calories per kg of body weight). To create a calorie deficit, the intake was set at 1400 calories, resulting in a **total deficit of 375 calories**. A calorie deficit forces the body to rely on stored fat as an energy source. This is because the body must compensate for the shortfall in calories needed for daily functions (known as Total Energy Expenditure, or TEE). Studies have shown that when a calorie deficit is achieved, the body begins to mobilize fat stores; leading to reductions in body fat mass.[4] Calorie intake was tracked using the Android app **Healthymefy**, where patient logged her daily food consumption. The app provided an approximate breakdown of calories for each food component and kept a record of the total daily intake. Over the intervention period, the average calorie intake recorded was **1376 calories**. Regarding the nutritional components of food, particular attention was given to balancing the intake of carbohydrates, fats, proteins, and fibre. The focus was primarily on reducing carbohydrate and fat consumption, as these are often linked to weight gain. As a result, greater emphasis was placed on increasing the intake of protein and fibre, which are essential for promoting satiety, supporting muscle maintenance, and improving digestion. The table below lists various food items that can be traced back to Ayurveda treatises, specifically mentioned in *Sthaulya Pathya Aahara*.[5] In addition to these items, there are also several other foods that, upon consumption, may lead to slow digestion in the gut or can be considered *Guru* (heavy) in nature.

Table 2: Dietary Intervention

SN	Category	Foods to include	Foods to avoid or to be taken less frequently. Viz. once in 15 - 30 days.	Other tips
1.	Rice	*Basmati, Lashkari Kolam, Kalimucch*	*Indrayani, Malavani, Ambemohor*	Preferably rice to be taken in 1st meal, avoid in the evening meal.
2.	*Daal*/Lentils	*Moong, Tuvar, Masoor*	*Chana, Urad, Rajma, Soyabean*	
3.	Whole Grains	non-sprouted *Matki, Moong*	Sprouted *Chana*, Peas, *Matki, Mung*.	
4.	*Chapati/Roti /Bhakar*	*Bajra, Jowar + Sattu, Nachani, Paratha, moong Chilla*,	Wheat, *Maida, Rawa*	Wheat roti is allowed in the 1st meal not in the later meal.
5.	Leafy vegetables	Radish, *Laal Math, Tandulaja,*	*Palak, Methi, Shepu.*	
6.	Fruit vegetables	Brinjal, bitter gourd, flower, cabbage, lady fingers, pumpkin	Tomato, Potato, Brinjals (large),	
7.	Fruits	Grapes, Pomegranate, *Amsul*, Seasonal fruits	Nonseasonal fruits,	Can have any fruit, but it should not be considered a whole meal. The portion of fruits should be limited, and they should not be consumed before or after a large meal. Fruits should be consumed exclusively when there

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				is a sensation of hunger.
8.	Dairy Products	Milk approx. 250 ml/day, Ghee, buttermilk.	Curd, cheese, butter, paneer,	
9.	Meat/non-veg	Eggs, seafood, mutton, Chicken legs	Chicken breast	Meat-based dishes are to be taken as the first meal only.
10.	Miscellaneous	Chutneys, *Rayta, Koshimbir,*	Sauces, Mayonnaise, packed – ready-to-eat food items such as – pasta, noodles, and chips. Overprocessed food items – chips, burgers, pizza, Street foods, Desserts.	If the patient enjoys sweets, they can be eaten before a meal, rather than after as a dessert. Fast food can be consumed once a month, but not one after the other for an entire month, avoid hotelling and stale food as much as possible.
11.	Salads	Radish, Carrot, beetroot, cucumber, cabbage		A small portion of salad is considerate
12.	Snacks	*Shira* and *Upma* are made out of *Rawa* (Suji), plain *dosa*, *moong chilla*, Scrambled eggs, boiled eggs, *Paratha*, *Makhana, Laddus,* and *Karanji*.	Chips, *Farsan*, Waffles, Donuts, Cakes, Pastries, softies, ice-creams	Snacks are supposed to be taken in fewer portions and not to be considered a large meal.
13.	Beverages	Tea/coffee once a day, lemonade juice, whole fruit juice.	Cold drinks, alcohol-based drinks, soda-based drinks protein shakes, smoothies, and milkshakes.	Smoothies and milk-based shakes are to be avoided at all possible times.

Assessment Tools

Objective and subjective parameters were assessed at baseline and during follow-ups:

Objective Parameters

These included weight, BMI, waist-to-hip ratio, neck circumference, thigh girth, and HbA1c levels, which were recorded at regular intervals to track progress.

Subjective Parameters

Quality of life and self-esteem were measured using the WHO Quality of Life (WHOQOL)[6] scale and Rosenberg Self-Esteem scale[7], respectively. These scales were administered as self-report questionnaires, and scores were recorded to evaluate improvements in mental well-being and perceived quality of life.

Follow-up and Data Collection

Follow-ups were conducted initially every 15 days and then monthly. During each follow-up, objective parameters were recorded, and subjective scales were re-administered. The patient also provided feedback on her experience with the intervention. A total of 15 follow-ups were conducted throughout the duration.

Statistical Analysis

Descriptive analysis was used to compare baseline and follow-up data, focusing on percentage changes in weight, BMI, waist-to-hip ratio, and HbA1c. Trends

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over time were visually presented to highlight the patient's progress.

Follow-up and Outcomes:

Clinical Course: Regular follow-ups indicated gradual weight loss and improved metabolic health.

Outcomes: BMI reduced to 23.3 Kg/m², HbA1c reduced to 4.4%, Waist Hip ratio reduced to 0.78, weight reduced to 58.1 kg, amounting to 12.9kg lost over a 10-month intervention period.

Table 3: Follow-up outcomes over an intervention period

SN	Date	Weight (In Kgs)	Waist-to-hip ratio	Neck circum.	Thigh Girth	BMI (Kg/m²)	HbA1c
1.	01/06/23	71	0.860	15”	24.5	28.4	5.2%
2.	25/06/23	70.1	0.855	14.96”	24.3	28.1	
3.	12/07/23	68.5	0.850	14.93”	24.1	27.4	
4.	30/07/23	66.9	0.843	14.89”	23.86	26.8	
5.	13/08/23	65.8	0.837	14.86”	23.59	26.4	5.2%
6.	03/09/23	65	0.834	14.82”	23.27	26.0	
7.	17/09/23	64.2	0.829	14.79”	23	25.7	
8.	24/09/23	63.2	0.826	14.72”	22.81	25.3	
9.	30/09/23	63	0.821	14.71”	22.76	25.2	4.9%
10.	10/10/23	62.2	0.814	14.68”	22.54	24.9	
11.	09/11/23	61.4	0.809	14.63”	22.32	24.6	
12.	10/12/23	60.6	0.802	14.56”	22.12	24.3	4.63%
13.	12/01/24	59.3	0.794	14.50”	21.93	23.8	
14.	01/02/24	58.4	0.788	14.42”	21.74	23.4	4.4%
15.	10/02/24	58.1	0.781	14.30”	21.68	23.3	

OBSERVATIONS AND RESULTS

A) Descriptive Analysis: Baseline vs. Follow-up

Table 4: Comparison of outcome with baseline findings.

SN	Parameter	Baseline	Follow-up (After 10 months)
1.	Weight (kg)	71 kg	58.1 kg
2.	BMI (kg/m²)	28.4	23.3
3.	Waist-to-Hip Ratio	0.86	0.781
4.	Neck circumference (inches)	15 inches	14.30 inches
5.	Thigh Girth (inches)	24.5 inches	21.68 inches
6.	HbA1c (%)	5.2%	4.4%

B) Percentage Change Calculation

- **Weight:** Percentage Weight Loss = (71−58.1/71) × 100 = 18.17%; the patient experienced an **18.17% weight loss** over 10 months.
- **BMI:** Percentage BMI Change = (28.4−23.3/28.4) × 100 = 17.96%, The BMI decreased by **17.96%**, indicating a significant reduction in obesity classification.
- **Waist to Hip Ratio:** Percentage Change in Waist to Hip Ratio = (0.86−0.781/0.86) × 100 = 9.19%, the waist-to-hip ratio decreased by **9.19%**, indicating reduced central obesity.
- **Neck Circumference:** Percentage Change in Neck Circumference = (15−14.3/15) × 100 = 4.67%; The Neck circumference decreased by **4.67%**.
- **Thigh Girth:** Percentage Change in Thigh Girth = (24.5−21.68/24.5) × 100 = 11.51%; the thigh girth was reduced by **11.51%**, indicating reduced fat mass in the lower body.
- **HbA1c:** Percentage Change in HbA1c = (5.2−4.4/5.2) × 100 = 15.38%; The HbA1c level lowered by **15.38%**, showing better blood sugar control.

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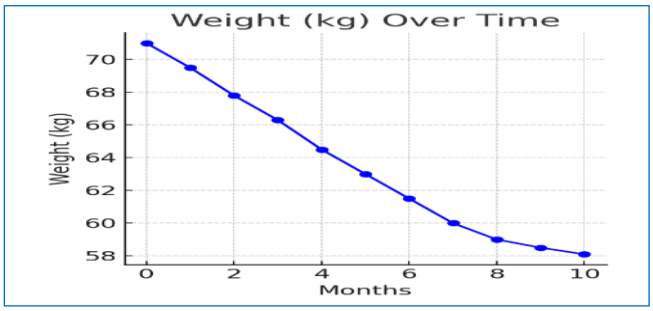
C) Trends Over Time

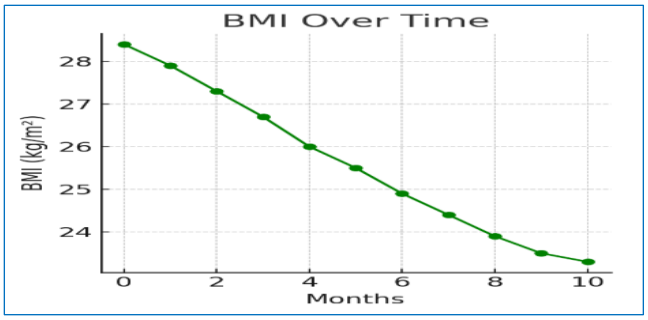
The patient's weight decreased steadily over the 10 months, showing consistent progress without plateaus. Similarly, the BMI, waist-to-hip ratio and other metrics followed a downward trend, indicating an overall improvement in the patient's health metrics.

Patient Perspective

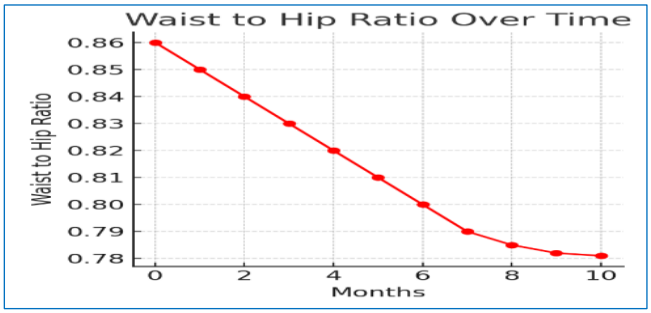
The patient reported improved quality of life, increased energy levels, and enthusiasm, satisfaction with the treatment. Overall, the intervention led to significant and sustained improvements in weight, BMI, body composition, and metabolic health, demonstrating the effectiveness of combining *Yoga* with intermittent fasting and a controlled diet for weight loss and obesity management.



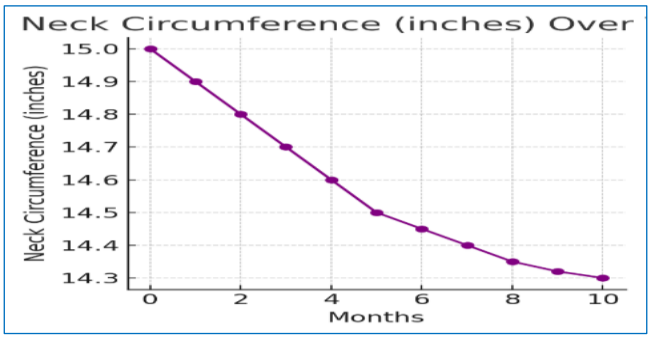
Graph 1: Weight (kg) over time



Graph 2: BMI over time

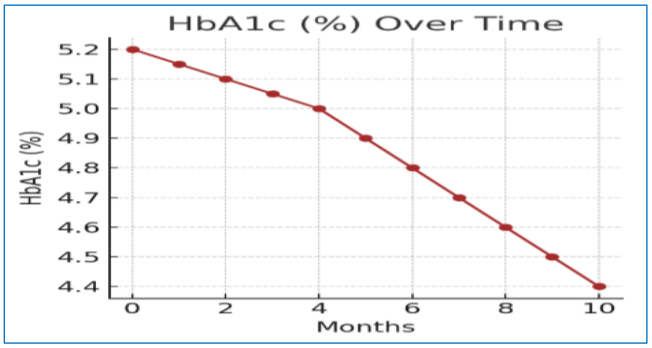


Graph 3: Waist to hip ratio over time



Graph 4: Neck circumference (inches) over time

Graph 5: Thigh girth (inches) over time



Graph 6: HbA1c (%) over time

DISCUSSION

Yoga and Weight Management

Yoga is recognised for its holistic benefits, including stress reduction, flexibility improvement, and weight management. Studies have demonstrated that regular *Yoga*, particularly postures like *Surya Namaskar*, enhances physical fitness and supports fat loss through increased energy expenditure.[8] *Yoga* improves metabolic function by lowering cortisol levels and activating the parasympathetic nervous system, which helps reduce stress-induced overeating and poor metabolic regulation. Research has shown that *Yoga* not only aids in body fat reduction but also improves

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insulin sensitivity, making it a useful intervention for managing obesity.[9]

Intermittent Fasting

Intermittent fasting (IF), especially the 16:8 regimen, has gained attention as an effective weight-loss strategy. This approach involves fasting for 16 hours daily and eating within an 8-hour window, which leads to improved metabolic flexibility and fat oxidation.[10] Studies have indicated that intermittent fasting enhances insulin sensitivity, reduces visceral fat, and decreases body fat percentage.[11] It also induces mild caloric restriction, which contributes to a reduction in body mass index (BMI) and improved lipid profiles.[12] Moreover, IF has been linked to better blood glucose control and reductions in HbA1c levels, especially in individuals with obesity.[13]

Dietary Corrections and Caloric Restriction

Dietary modification plays a crucial role in weight loss and the management of metabolic health. A well-structured, calorie-deficit diet has been shown to reduce body weight by limiting caloric intake while preserving lean muscle mass.[14] Caloric restriction shifts the body's metabolic state towards increased fat oxidation. When dietary intake does not meet energy demands, the body metabolizes triglycerides stored in fat cells, leading to a reduction in adipose tissue (body fat).[15] Emphasizing whole grains, lean proteins, and fibres while reducing refined carbohydrates and sugars is effective in lowering body fat percentage and improving insulin resistance.[16] Incorporating Ayurvedic dietary principles, which focus on the *Guru* (heavy) and *Laghu* (light) properties of foods, complements modern diet practices by promoting foods that aid digestion and prevent the build-up of *Kapha* (responsible for fat storage).[17] This holistic approach ensures balanced nutrition while maintaining caloric control.

Metabolic Health Indicators (Weight, BMI, Waist-to-Hip Ratio, and HbA1c)

The reduction in weight and BMI is widely regarded as a critical indicator of obesity management.[18] Lowering these metrics reduce the risk of associated comorbidities, such as Type 2 diabetes and cardiovascular diseases. The waist-to-hip ratio (WHR), an important measure of central obesity, is closely related to metabolic disorders.[19] Reducing WHR through lifestyle interventions is linked to improvements in insulin sensitivity and reduced risk of hypertension.

Informed Consent

The patient provided written consent for the publication of this case report.

CONCLUSION

This case report highlights the positive outcomes of an integrative weight-loss approach that combines yoga, intermittent fasting, and targeted dietary adjustments. Over ten months, the patient achieved measurable improvements in weight, BMI, waist-to-hip ratio, and HbA1c, alongside enhanced quality of life and self-esteem. By tailoring the Yoga regimen to support both physical strength and stress management, the intervention encouraged healthier habits and better metabolic regulation. Paired with a balanced diet and intermittent fasting, this approach demonstrates how traditional practices can effectively complement modern dietary strategies. Overall, this case illustrates the potential of a holistic, personalized approach to weight management, offering a promising alternative to conventional methods for achieving sustainable health and wellness.

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