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Comparison of Gomaya Mashi and Rodhradi Gana Udvartana followed by Bhaspa Swedana in Sthoulya (Obesity)

Research Article

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Abstract

The World Health Organization (WHO) describes Obesity as a condition characterized by excessive deposition of body fat to the point where it adversely affects health. Body mass index (BMI) values within 25 and 29.9 kg/m^2 and below 30 kg/m^2 are two measures of the positive energy imbalance that leads to obesity. In 2000, World Health Organization identified Obesity as the most clearly evident yet most ignored public health problem worldwide. The World Health Organization ranks obesity as the second most dangerous disease in the world. The worldwide impact of Obesity is recorded to be 4 million obesity-related deaths and 40 million disability-adjusted life years among adults globally in 2015. Family history, frequent overeating patterns, and lack of physical activity are all significant risk factors. When treating *Sthula* (obese patients), *Ruksha Udvartana* is mentioned, which involves using a dry powder of herbs without oil is used. Therefore, for the current study, it was decided to choose the *Rodhradigana Udvartana* followed by *Bhaspaswedana* and *Gomaya Mashi Udvartana* followed by *Bhaspaswedana* as a comparative study. The purpose of the current study is to document and examine this process for statistical interpretation. Aim: Evaluation of Comparative efficacy of *Rodhradi Gana Udvartana with Bhaspaswedana and Gomaya* Mashi *Udvartana with Bhaspawedana* in the management of *Sthoulya* (obesity). Material and Methods: Data related to the disease as well as the drug was collected from Samhitas, other classical Ayurvedic literature, and various modern science books. Subjects visited to outdoor and indoor *Panchakarma* department and from the specialty camps were registered for the present study. Result: Significant improvement was observed in both groups and during comparison, more results were found in the Gomaya Mashi group (Group B). Conclusion: *Udvartana* with *Gomaya Mashi* followed by *Bhaspasweda* is more effective than *Udvartana* with *Rodhradi Gana* followed by *Bhaspasweda* in the management of *Sthoulya* (Overweight) and is an economical alternative without adverse effects.

Keywords: Obesity, *Sthoulya*, *Udvartana, Gomaya Mashi, Bhaspaswedana, Rodhradi Gana*.

Introduction

The World Health Organization (WHO) describes Obesity as a condition characterized by excessive deposition of body fat to the point where it adversely affects health (1). Body mass index (BMI) values within 25 and 29.9 kg/m^2 and below 30 kg/m^2 are two measures of the positive energy imbalance that leads to obesity (2). In 2000, World Health Organization identified Obesity as the most clearly evident yet most ignored public health problem worldwide (3). The World Health Organization ranks obesity as the second most dangerous disease in the world (4). In both developed and developing countries, Obesity has emerged as a significant public health challenge due to its causative connections with various chronic noncommunicable diseases, such as Cancer, Cardiovascular disorders, and Type 2 Diabetes (5). Numerous studies have revealed that obesity is a well-known main risk factor for various non-communicable diseases and health conditions including stroke, dyslipidemia, hypertension, coronary heart disease, several cancers, and type 2 diabetes (6). According to World Health Organization in 2016, over 1.9 billion persons aged 18 years and above were classified as overweight or obese (7).

The worldwide impact of Obesity is recorded to be 4 million obesity-related deaths and 40 million disability-adjusted life years among adults globally in 2015 (8). In the Urban region of Maharashtra, the prevalence of Obesity is 6.6% and 2.2%, and in rural regions prevalence of Obesity is 3.4% and 0.6%. As compared to rural regions, urban regions have a higher frequency of Obesity. Family history, frequent overeating patterns, and lack of physical activity are all significant risk factors (9).

In India, the prevalence of Obesity is influenced by factors like sex, age, socio-economic status, geographical environment, etc. ICMR-INDIAB study in 2015 revealed that the prevalence rates of Obesity and central Obesity range from 11.8% to 31.3% and 16.9%-36.3% respectively. Abdominal Obesity is one of the significant risk factors for cardiovascular disease in India. Raising awareness about Obesity and its negative health effects can play an important role in its

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prevention. Governmental organizations should actively promote the advantages of a healthy way of life, including nutritious eating habits and regular physical activity (10). Obesity is most commonly seen in middle age but can manifest at any life stage. Typically women are more susceptible than men (11). There is currently a "double burden" of disease in numerous low and middle-income nations. In addition, these countries continue to deal with challenges related to infectious diseases and malnutrition, these nations also experience a rapid increase in noncommunicable disease risk factors like Obesity and Overweight, especially in urban areas (12). Modern science has developed various treatment approaches for Obesity, including Physical exercise, diet, drug therapy, and surgery. However, they have certain drawbacks, including mental and neurological adverse effects. They result in faecal urgency, fatty/oily stool, and an imbalance of fat-soluble vitamins (13). Therefore, it is necessary to find simple yet efficient therapy options in alternative science i.e. Ayurveda.

According to *Ayurveda*, Obesity can be correlated with *Sthoulya. Sthoulya* falls under the category of *Santarpanottha Vyadhi*, resulting from the predominance of *kapha* and *Medovaha Srotasa dushti*. It involves excessive and abnormal accumulation of *Meda Dhatu* in the body (14). According to *Acharya Charak Atisthula* is one among *Astonindita Purush* (15). *Udara, Stana*, and *Sphik* get enlarged when there is excessive accumulation of *Mamsa* and *Meda* in the body. This improperly formed *Medo Dhatu* leads to low energy and decreased in enthusiasm in the persons, referred to as *Atisthla* (16).

The contributing factors (*Hetu*) for *Sthoulya* are sleeping during the day, lack of physical exercise, and excessive intake of *Kapha and Meda* Prakopaka Aahar. Moreover, *Beejaswabhava* (Hereditary) may be the cause (17). All of these *Hetus* disrupt *Agni*, which causes the body to produce *Ama* (undigested food). *Strotorodha* and *Medodhatvagni Mandya* are caused by this *Ama*. This *Strotorodha* leads to obstruction in *Vata* which stimulates *Agni* (digestive fire) in the *Koshtha,* which results in *Atikshudha* (excessive hunger). *Medodhatvagnimandya* disrupts the nourishment of subsequent *Dhatus*, leading to excessive production of *Vikrut Medo Dhatu*, this excessive accumulation of *Meda* results in *Sthoulya***.** This excessive *Medas* block all the channels that continuously supply nutrients to other tissues, leading to improper formation of new tissues and cause accumulation of *Meda* in the body (18). The person affected by *Sthoulya* may experience *Trishnadhikya* (excessive thirst), *Nidradhikya* (excessive sleep), *Kshudrashwas* (dyspnoea on exertion), *Krathana* (sudden obstruction to respiration), *Saad* (tiredness), *Moha* (delusion), *Atikshudha*, *Sweda Daurgandha* (bad smell of the body), *Alpayu* (decreased life expectancy), *Alpamaithuna* (decrease sexual potency). These symptoms are characteristic of *Sthoulya* (19).

India is a country rich in traditions that have strong ties to ancient science directly connecting social rituals with scientific explanation. In Indian culture, the cow is revered as a God called '*Gaumata'* because of its nourishing characteristics similar to the mother (20). *Panchgavya* refers to cow-derived milk, urine, dung, ghee, and curd which has significant medicinal value. The *Panchgavya* therapy has shown remarkable efficacy in treating various diseases including obesity, dietary and GIT disorders, asthma, flu, allergies, cardiovascular disorder, nephrotic disorders, RA, leucoderma, healing of wounds, leucorrhoea, hepatitis, TB, ulcer, chemical intoxication, other bacterial, fungal and viral infections. Additionally, the treatment has shown promise in treating serious pathological conditions such as cancer, AIDS, and diabetes (21).

Based on previous clinical evidence, various herbal drugs can be used for *Udvartana.* However, this study introduces novel efforts to study the comparative efficacy of *Udvartana* with *Gomaya Mashi* i.e. cow dung ash powder (Animal product) and herbal powder in the management of Obesity.

In modern medicine, there are several obesity treatment options, including drugs like Sibutramine, Fenfluramine, and Dexfenfluramine which act as appetite suppressants and have side effects and are not recommended for use longer than 3 months. Purgative and diuretic medications are also used to manage obesity, but their effects are temporary and the patient regains weight after discontinuing the treatment. Some instruments like vibrators, are used for localized lipolytic action. The expensive Nutritional combinations (synthetic nutritional ingredients) also have side effects.

In contrast, *Ayurveda* offers promising treatments for obesity without any side effects. For example, Ayurvedic *Sodhana* procedures like *Virechana*, *Vaman*, *Lekhana Vasti*, and *Udvartan* (22) have shown potential for managing obesity. Among them, *Vaman, Virechan,* and *Lekhan Vasti* has their own limitations like pre and post-therapeutic procedures, which are time-consuming for the patient and some patients hesitate to undergo *Lekhan Vasti*. Hence, the standard treatment modality used in the management of *Sthoulya* (Obesity) is *Udvartana. Udvartana* and *Bhaspaswedana* are *Bahya Shodhana* techniques that help melt fat and eradicate vitiated *Dosha* through the skin. Both *Kaphhar* and *Medohar* properties belong to *Udvartana*. *Acharya Charaka* mentioned two types of *Udvartana*: *Snigdha Udvartana* and *Ruksha Udvartana*. When treating *Sthula* (obese patients), *Ruksha Udvartana* is mentioned, which involves using a dry powder of herbs without oil is used. Therefore, for the current study, it was decided to choose the *Rodhradigana Udvartana* followed by *Bhaspaswedana* and *Gomaya Mashi Udvartana* followed by *Bhaspaswedana* as a comparative study. The observation from a pilot study conducted at our hospital on the same over considerable samples shows a significant decrease in body weight within a short period of time, with no reported adverse effects. The purpose of the current study, entitled Comparative Evaluation of Efficacy of *Gomaya Mashi Udvartana* with *Bhaspaswedana* and *Rodhradigana Udvartana* with *Bhaspaswedana* in the management of *Sthoulya* (Obesity), was to document and examine this process for statistical interpretation.

Aims and Objectives

Aim

Evaluation of Comparative efficacy of *Rodhradi Gana Udvartana with Bhaspaswedana and Gomaya Mashi Udvartana with Bhaspaswedana* in the management of *Sthoulya* (obesity).

Objectives

To assess and compare the efficacy of *Rodhradi Gana Udvartana with Bhaspaswedana and Gomaya* Mashi *Udvartana with Bhaspaswedana* over Weight in Kg and B.M.I. in Obesity

To assess and compare the efficacy of *Rodhradi Gana Udvartana with Bhaspaswedana and Gomaya* Mashi *Udvartana with Bhaspaswedana* over anthropometric parameters or measurements e.g. Mid arm circumference, abdominal circumference, Mid-thigh circumference, Waist-Hip Ratio, and Skin fold thickness in Obesity.

To assess and compare the efficacy of *Rodhradi Gana Udvartana with Bhaspaswedana and Gomaya* Mashi *Udvartana with Bhaspaswedana* over biochemical parameters e.g. Serum Lipid Profile in Obesity.

Materials and methods

Material: Data related to the disease as well as the drug was collected from Samhitas, other classical Ayurvedic literature, and various modern science books.

Clinical source: Subjects visited outdoor and indoor *Panchakarma* department and from the speciality camps were registered for present study.

Methodology: Approval of Institutional Ethics Committee (Ref no MGACHRC/IEC/July-2020/61 on dated 28/07/2020. The study was started after CTRI registration- Reg.no. CTRI/2020/08/027376. The written informed consent form was received from each patient prior the commencement of the study, and the case proforma was also filled.

Study design: Randomized Single-blind Standard Controlled trial.

Study Type: Interventional-Study.
Sample Size: 60
Grouping: Group A (30 patients) and Group B (30 patients)

Inclusion criteria

- ICD Criteria for Obesity (23)
- Individuals of either sex between the age of 20 to 40 years.
- Subjects with B.M.I. >25-40 kg/m2
- Participants willing to take part in the study and sign the informed consent form.

Exclusion criteria

- Individuals with K/c/o Hypothyroidism, DM, Cardiovascular disorders, Nephrotic disorders and obesity induced by drugs etc.
- Pregnant women and breast feeding mother.
- Individuals showing unsuitability of Drug or ADR
- Those who do not wish to continue treatment for any personal reason
- Any other illness developed during treatment
- Patient contraindicated for *Udvartana* and *Bhaspaswedana*

Withdrawal Criteria

- If symptoms get aggravated during the trial.
- Subjects not willing to continue treatment
- If drug intolerance or any other ailment occurs, the patient will be treated for free until the situation gets corrected.

Selection of material: The identification of raw drugs was carried out at the *Dravyaguna* Department of our institute.

Preparation of Drugs

Preparation of *Rodhradigana*- All the raw herbs are made into powder and mixed together to make a homogeneous mixture (24).

Preparation of *Gomaya Mashi*- After burning the cow dung cake, make the leftover into powder which is called *Gomaya Mashi* (25).

Table No. 1: Ingredients of *Rodhradi gana*

Drug	Latin Name	Family	Synonyms	Part Used
Lodhara (26)	*Symplocos recemosa Roxb.*	*Symplocaceae*	*Tilva, Tirita, Galava*	Bark
***Palash* (27)**	*Butea monosperma Lam.*	*Leguminosae*	*Kimsuka, Parna, Rakta puspaka*	Whole plant
Shyonaka (28)	*Oroxylum indicum Vent.*	*Bignonaceae*	*Shyonaka, Tuntuka, Kutannata, Bhalluka, Pruthushimb*	Bark
Asoka (29)	*Saraca asoca (Roxb.) De Wilde*	*Caesalpiniaceae*	*Hema puspa, Vanjula, Kankeli, Pindapuspa*	Bark
Bharangi (30)	*Celerodendrum serratum Linn.*	*Verbenaceae*	*Padma, Phanji*	Root Bark (*Churna* shown in image)
Kataphala (31)	*Myrica esculenta (Buch-Ham.)*	*Myricaceae*	*Kayphala, Somavalka, Kumbhika, Sriparni*	Bark
***Shalmali* (32)**	*Salmalia malabarica (Schott & Endl.)*	*Bombacaceae*	*Moca, Pichcila, Purani, Tulini*	Whole plant
Manjista (33)	*Rubia cordifolia Linn.*	*Rubiaceae*	*Vikasa, Madukparni, Bhandiri, Aruna*	Root
Kadamba (34)	*Anthocephalus Indicus Miq.*	*Rubiaceae*	*Neep, Preeyak, Vrutpushpa*	Bark
***Kadali* (35)**	*Musa paradisiaca Linn.*	*Musaceae*	Banana, Plantain	Flower, Rhizome, Stem

Figure 1: Ingredients of *Rodhradigana*

A. *Lodhra*	B. *Palash*	C. *Shonak*
		
D. *Ashoka*	**E. *Bharangi***	**F. *Katphala***
		
G. *Shalmali*	**H. *Manjista***	**I. *Kadamba***
		
J. *Kadali*		
		

Figure 2: *Gomaya Mashi*

Procedure of *Udvartana* (with care and precautions)

The best time for *Udvartana* is in the early morning as in daily regimen it is mentioned before *snana*. Before doing *Udvartana*, bladder and bowel should be emptied. Blood pressure, pulse rate, heart rate and respiratory rate was recorded before doing *Udvartana*. *Udvartana* is started from legs, arms, chest, abdomen, back, and gluteal region and is done in upward direction. *Udvartana* should not be done on tender parts of body. Generally, duration is 30 to 45 minutes. After *Udvartana*, patient should take rest for 5 to 10 minutes, which helps the patient to relax.

Figure 3: *Udvartana* Procedure

Procedure of *Bhaspasweda* (with care and Precautions)

Bhaspasweda, is done with the help of *Swedana Yantra* (wooden steam chamber), it is a box-like structure in which the patient sits while steam infused with *Dashmoola* decoction (medicinal herbs) is directed into the chamber, induce sweating. After performing the *Udvartana* procedure, the *Bhaspasweda* procedure was done. The patient was advised to drink a glass of warm water before entering the *Swedana Yantra* to stay hydrated during the procedure. Blood pressure, pulse rate, heart rate, and respiratory rate was recorded before doing *Swedana*. In *Bhaspasweda* the temperature typically ranges from 40°C to 46°C, with the help of heating source (gas-stove or Induction), located outside the chamber. The heating source is controlled to regulate the temperature inside the *Swedana Yantra*. *Bhaspaswda* procedure typically ranges from 10 to 20 minutes, depending upon individual tolerance or until the abdomen and forehead sweat very well. After the *Bhaspasweda*, the patient was advised to take bath with lukewarm water to rinse off sweat and toxins released during the *Bhaspasweda*.

Figure 4: *Bhaspaswedana* Procedure

Posology

Table no. 2: Grouping and Posology: (As per PICO model)

Group	Sample Size	Intervention	Quantity and Frequency	Duration	Follow up
A	30	*Udvartana* with *Rodhradi Gana* followed by *Bhaspaswedana*	100 gm daily once	15 days	16th day
B	30	*Udvartana* with *Gomaya Mashi* followed by *Bhaspaswedana*	100 gm daily once	15 days	16th day

Both groups were advised to follow *Pathyapathya,* which includes the form of *Ahar* and *Vihar* (early morning awakening and engaging in 30 minutes of brisk walking) on the basis of *Samhita* recommendations (36).

Study Duration: 30 Days
Follow-up period :16 th days (After-Treatment)
Investigation: FBS and Lipid profile Before treatment

Assessment Criteria

a) Objective

The following Anthropometric measurements will be taken before and after the treatment using a measuring tape and weighing machine;

- The Patient's body weight in kilogram (measured while wearing the same cloth and an empty stomach)
- Body Mass Index (an International B.M.I. criteria have been calculated by following the formula)
- Anthropometric Assessment using a measuring tape, was conducted before and after the treatment of the following areas where generally the adiposity is found more will be taken
  - Waist-Hip Ratio
  - Abdomen circumference – At the level of umbilicus
  - Mid arm circumference – Mid of the arm between elbow joint and shoulder joint.

The body weight will also be recorded before and after treatment (for all circumferences measurements, the mean values will be recorded before and after treatment).

Table 3: PICO model

1	**P**	Person with Obesity having B.M.I. >25-40 kg/m2 diagnosis based on this criteria
2	**I**	*Udvaratna* with *Gomaya Mashi*
3	**C**	*Udvaratna* with powder of *Rodharadigana*
4	**O**	Reduction in Body Weight, B.M.I., Anthropometric measurements, serum lipid profile

Figure 5: Study design and Plan of Work

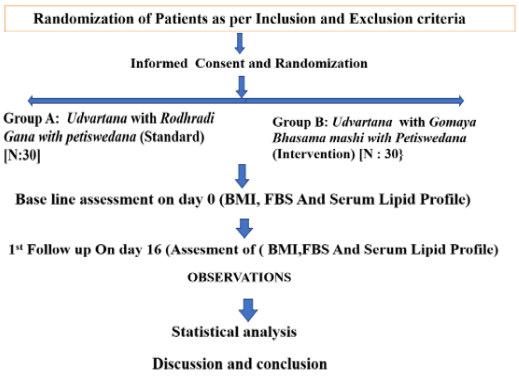
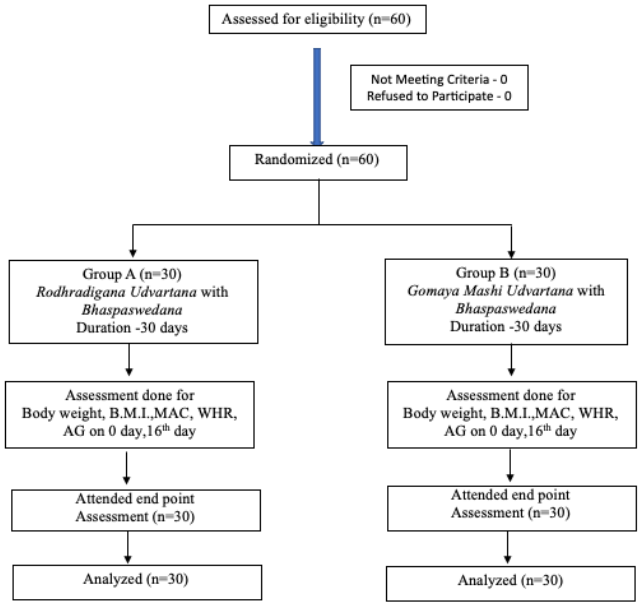


Figure 6: Consort Chart



Observations and Results

As per Objective parameters like Weight, BMI, Mid-arm Circumference, Waist-Hip Ration, Abdominal Girth had shown significant result.

In *Rodhradigana Udvartana* group evaluation over anthropometric assessment shows following results for t-test analysis.

Mean weight recorded at before with value 71.1100 and standard deviation 6.99055 while after recorded with value 68.751 and standard deviation 6.94489 with mean difference of 2.424138 found significant as P-value results <0.01.

Mean BMI recorded at before with value 27.4607 and standard deviation 1.57587 while after recorded with value 26.5667 and standard deviation 1.69570 with mean difference of 0.894 found significant as P-value results <0.01.

Mean Mid Arm Circumference recorded at before with value 31.6333 and standard deviation 2.28161 while after recorded with value 30.6000 and standard deviation 2.20657 with mean difference of 0.894 found significant as P-value results <0.01.

Mean Waist Hip Ratio recorded at before with value 0.8783 and standard deviation 0.06221 while after recorded with value 0.8710 and standard deviation 0.06144 with mean difference of 0.894 found significant as P-value results <0.01.

Mean Abdominal Girth recorded at before with value 122.1667 and standard deviation 12.15442 while after recorded with value 119.1667 and standard deviation 11.82657 with mean difference of 1.17444 found significant as P-value results <0.01.

Table 4: Comparative evaluation of anthropometric variables (Before vs After) for *Rodhradigana Udvartana* group using Paired t-test

***Rodhradigana Udvartana* group**							
Variables	Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-test	P-value
BT (Weight	71.1100	30	6.99055	1.27629	2.424138	11.42857	<0.01
AT (Weight)	68.7517	30	6.94489	1.26796			
BT (BMI)	27.4607	30	1.57587	0.28771	0.894	10.50965	<0.01
AT (BMI)	26.5667	30	1.69570	0.30959			
BT (Mid Arm Circumference (MAC)	31.6333	30	2.28161	0.41656	0.894	7.878391	<0.01
AT (Mid Arm Circumference (MAC)	30.6000	30	2.20657	0.40286			
BT Waist Hip Ratio (WHR)	0.8783	30	0.06221	0.01136	0.894	4.427567	<0.01
AT Waist Hip Ratio (WHR)	0.8710	30	0.06144	0.01122			
BT Abdominal girth (AG)	122.1667	30	12.15442	2.21908	1.17444	13.99107	<0.01
AT Abdominal girth (AG)	119.1667	30	11.82657	2.15923			

Table 5: Comparative evaluation of anthropometric variables (Before vs After) for *Gomaya Mashi Udvartana* group using Paired t-test

***Gomaya Mashi Udvartana* group**							
Variables	Mean	N	Std. Deviation	Std. Error Mean	Mean Difference	t-test	P-value
BT (Weight	71.5133	30	6.35950	1.16108	3.58	10.67606	<0.01
AT (Weight)	67.9333	30	6.18236	1.12874			
BT (BMI)	27.6000	30	1.00995	0.18439	1.263333	20.42101	<0.01
AT (BMI)	26.3367	30	1.05389	0.19241			
BT (Mid Arm Circumference (MAC)	32.3000	30	1.41787	0.25887	1.966667	19.37202	<0.01
AT (Mid Arm Circumference (MAC)	30.3333	30	1.44636	0.26407			
BT Waist Hip Ratio (WHR)	0.8837	30	0.05455	0.00996	0.01	5.574175	<0.01
AT Waist Hip Ratio (WHR)	0.8737	30	0.04951	0.00904			
BT Abdominal girth (AG)	122.3333	30	12.19761	2.22697	4.133333	14.62756	<0.01
AT Abdominal girth (AG)	118.2000	30	12.09275	2.20782			

In *Gomaya Mashi Udvartana* group evaluation over anthropometric assessment shows following results for t-test analysis.

Mean weight recorded at before with value 71.5133 and standard deviation 6.35950 while after recorded with value 67.9333 and standard deviation 6.18236 with mean difference of 3.58 found highly significant as P-value results <0.01.

Mean BMI recorded at before with value 27.6000 and standard deviation 1.00995 while after recorded with value 26.3367 and standard deviation 1.05389 with mean difference of 1.263333 found highly significant as P-value results <0.01.

Mean Mid Arm Circumference (MAC) recorded at before with value 32.3000 and standard deviation 1.41787 while after recorded with value 30.3333 and standard deviation 1.44636 with mean difference of 1.966667 found highly significant as P-value results <0.01.

Table 6: Inter group assessment for anthropometric evaluation between *Rodhradigana Udvartana* vs *Gomaya Mashi Udvartana* shows the following results

Variables	**Group**	**Mean difference**	**Std. Deviation**	**Standard Error**	**T-test**	**P-value**
Weight	*Rodhradigana Udvartana*	-2.424138	1.17884	0.21523	3.065991	0.003292
	Gomaya Mashi Udvartana	-3.5800	1.83668	0.33533		
BMI	*Rodhradigana Udvartana*	-0.8940	0.46592	0.08506	3.511382	0.00087
	Gomaya Mashi Udvartana	-1.2633	0.33885	0.06186		
Mid Arm Circumference (MAC)	*Rodhradigana Udvartana*	-0.9673	0.60345	0.11017	2.632771	0.010837
	Gomaya Mashi Udvartana	-1.3033	0.35280	0.06441		
Waist Hip Ratio (WHR)	*Rodhradigana Udvartana*	-0.9333	0.63968	0.11679	5.752588	<0.01
	Gomaya Mashi Udvartana	-1.9000	0.66176	0.12082		
Abdominal girth (AG)	*Rodhradigana Udvartana*	-1.0333	0.71840	0.13116	5.580823	<0.01
	Gomaya Mashi Udvartana	-2.0333	0.66868	0.12208		

Mean Waist Hip Ratio (WHR) recorded at before with value 0.8837 and standard deviation 0.05455 while after recorded with value 0.8737 and standard deviation 0.04951 with mean difference of 0.01 found highly significant as P-value results <0.01.

Mean Abdominal girth (AG) recorded at before with value 122.3333 and standard deviation 12.19761 while after recorded with value 118.2000 and standard deviation 12.09275 with mean difference of 4.133333 found highly significant as P-value results <0.01.

Mean difference for weight recorded *Rodhradigana Udvartana* with value -2.424138 compared to -3.5800 in *Gomaya Mashi Udvartana* found highly significant as P-value results with 0.003292 < 0.01.

Mean difference for BMI recorded *Rodhradigana Udvartana* with value -0.8940 compared to -1.2633 in *Gomaya Mashi Udvartana* found highly significant as P-value results with 0.00087 < 0.01.

Mean difference for Mid Arm Circumference recorded *Rodhradigana Udvartana* with value -0.9673 compared to -1.3033 in *Gomaya Mashi Udvartana* found highly significant as P-value results with 0.010837 < 0.01.

Mean difference for Waist Hip Ratio recorded *Rodhradigana Udvartana* with value -0.9333 compared to -1.9000 in *Gomaya Mashi Udvartana* found highly significant as P-value results with 5.752588 < 0.01.

Mean difference for Abdominal Girth recorded *Rodhradigana Udvartana* with value -1.0333 compared to -2.0333 in *Gomaya Mashi Udvartana* found highly significant as P-value results with 5.580823< 0.01.

Discussion

The aim of study was to assess Comparative evaluation of efficacy of *Gomaya Mashi Udvartana* with *Bhaspaswedana* and *Rodhradi Gana Udvartana* with *Bhaspaswedana* in the management of *Sthoulya* (Obesity). Every research work must include logical analysis and meaningful discussion to guarantee that it contributes significantly to the medical community and, as a result, benefits society. The purpose of the discussion is to look at the ideas from a perspective that is theoretical as well as practical.

In this study, before treatment mean score of body weight was 71.11±6.99 and 71.51±6.35 in group A and group B respectively which was reduced to 68.75±6.94 and 67.93±6.18 in group A and group B respectively after treatment. After therapy, there was a statistically significant improvement in the body weight of both groups, with a p-value of <0.1. A comparison of both the groups was done by using Student's Unpaired t-test and was found statistically significant before and after the completion of treatment. Based on mean differences and the statistical significance, it shows that group B (mean difference of 3.58) has a larger mean difference compared to group A (mean difference of 2.424138). This suggests that the change in weight after the intervention is more pronounced in group B.

In this study, the mean score of BMI before treatment was 27.46±1.57 and 27.60±1 in group A and group B respectively which reduced to 26.56±1.63 and 26.33±1.05 in group A and group B respectively after treatment. BMI showed statistically significant improvement after treatment in both groups with a p-value of <0.01.

To compare the two groups, Student's Unpaired t-test was used, and the results show that both group A and group B resulted in statistically significant reductions in BMI. The mean difference in BMI was greater in group B (-1.2633) compared to group A (-0.8940). This suggests that group B is more effective in BMI reduction.

In this study, before treatment mean score of MAC. was 31.63±2.28 and 32.30±1.41in group A and group B respectively which was reduced to 30.60±5.43 and 30.33±1.44 in group A and group B respectively after treatment. MAC showed statistically significant improvement after treatment in both groups with a p-value of <0.01.

To compare the two groups, Student's Unpaired t-test was used, and the results show that both interventions resulted in statistically significant reductions in MAC. The mean difference in MAC was larger in group B, suggesting that group B is more effective in terms of MAC reduction compared to group A.

In this study, the mean score of WHR before treatment was 0.878±0.062 and 0.88±0.05 in group A and group B respectively which was reduced to 0.871±0.061 and 0.87±0.04 in group A and group B respectively after treatment. WHR showed statistically significant improvement after treatment in both groups with a p-value of <0.01.

To compare the two groups, Student's Unpaired t-test was used, and the results show that both interventions resulted in statistically significant reductions in WHR. The mean difference in WHR was larger in group B, suggesting that group B is more effective in terms of WHR reduction compared to group A.

In this study, the mean score of AG before treatment was 122.166±12.154 and 122.33±12.19 in group A and group B respectively which was reduced to 119.166±11.826 and 118.20±12.092 in group A and group B respectively after treatment. AG showed statistically significant improvement after treatment in both groups with a p-value of <0.01. Goyal R, Kaur M, Chandola HM conducted study on *Sthoulya* and found their Ayurvedic intervention reduces the Abdominal circumference in their study which support to this study (37).

To compare the two groups, Student's Unpaired t-test was used, and the results show that both interventions resulted in statistically significant reductions in Abdominal girth. The mean difference in Abdominal girth is more in group B, suggesting that group B is more effective in terms of WHR reduction compared to group A.

Statistically significant reduction was observed in various objective parameters such as body weight, BMI, mid-arm circumference, Waist-Hip Ratio, and Abdominal circumference with the help of *Gomaya*

Mashi- Laghu, Ruksha, Ushna Veerya, Katu Vipaka, Lekhana and *Kapha-Pitta shamak* properties. All these properties serve to break the *Samprapti* of *Sthoulya.*

Pramod. et.al. conducted a study to evaluate the efficacy of *Tryushnadhya Lauha Vati* in *Sthoulya* and found significant improvement in Body weight, BMI, Mid arm circumference, and Waist hip ratio in their study (38).

Probable mode of action of drugs included in *Rodhradi Gana* and *Gomaya Mashi*:

Rodradradi Gana Dravyas mentioned in *Susruta Samhita* are *kaphahara* and *medahara (39)*. *Gomaya Mashi* has *Laghu, Ruksha, Ushna Veerya, Katu Vipaka,* and *Kapha Shamak* properties. Components of *Rodhradi Gana* and *Gomaya Mashi* have *Ushna* and *Tikshna Guna,* hence act as *kaphahara* and *Medohara,* they may be helpful in treating *Sthoulya* (obesity).

Probable mode of action of *Udvartana*:

Rukshan therapy like *Udvartana* is observed effective in *Sthoulya* and mentioned in the *Shodhana Chikitsa* of *Sthoulya* by different *Acharyas* in *Ayurvedic* texts.

Effect of *Udavartana* in Obese person (*Sthoulya*)

- *Kaphaharam* – Eliminates excessive *Kapha Dosha*
- *Vataharam* – Alleviates vitiated *Vata Dosha*
- *Medasaha Pravilaapanam* – This procedure liquefies and remove abnormal deposit/ stagnant *Meda*
- *Sthireekaranamangaanam* – It provides stability to various parts of body
- *Twakprasadakaramparam* – It give fresh appearance and rejuvenates the skin
- *Dourgandhyaharam* – It help to alleviate foul body odour
- *Gouravaharam* – It relives the feeling of heaviness in the body
- *Tandraharam* – It destroy drowsiness, and promotes alertness
- *Malaharam* – It removes dirt and dust from the skin
- *Swedaharam* – It reduces excessive sweating
- *Beebhatsaharam* – It improve appearance and gives glamourous look
- *Kantikaram* – It enhance shine and complexion (40,41)

The medicated powder applied in *Udvartana* procedure acts like *Kaphahara*, *Krumighna*, and *Kandughna* and have qualities like *Katu, Tikta, and Kashaya Rasa.* These drugs have *Ushna Virya* which promotes *Srotoshuddhi*, *Ruksha Guna* has dominance of *Agni* and *Vayu Mahabhuta* which subdued *Snigdha and Pichila* quality of *Kapha*, subsequently reduces *Kledatwa.* When these drugs applied to skin and massaged into it were digested by skin's *Bhrajakapitta/ Twachagni* (local temperature increases), the *Ushna Virya* penetrate *Rasadhatu* eliminate obstruction in *Rasavaha* and *Swedavaha Srotasa*, and its *Gunas, Veerya*, and *Vipak* spread throughout the body. By performing *Udvartana,* there is increase in *Twakgata Agni/Bhrajakapitta* which enhance the function of *Uttarottara Dhatwagni*, the increased *Medodhatwagni* facilitates the *Dhatupaka* process, leading to reduction in excessive accumulated *Vikruta Medo Dhatu* (42). When the vitiated *Medo Dhatu* undergoes dissolution, it leads to reduction in excessive *Sweda*, thereby treating, *Daurgandhyata, Swedatipravratti* (*Sweda* being a *Mala* of *Medo Dhatu* excessive sweating resulting in foul body odor), and normalizing *Dosha Dhatu Poshana Kriya* occurs. As a result, the characterstic symptoms of *Sthaulya Roga* like *Kandu, Daurgandhyata*, *Swedatipravratti,* are controlled, and body experience sense of lightness, The *Lakshanas Sthaulya* gradually reduced through the process of *Udvartana*.

As it is stated that fluid (*Ambu*) is present in *Medodhatu*, *Udvartana* used in this study has *Kapha-Medovilayana* property. The drug enters into body due to *Ushna* and *Tikshna* potency of *Dravyas* and the forceful dry (powdered) massaging action. It leads to the digestion (*Paka*) of *Kapha* and *Medas* by opening the *Mukha* of *Siras*. As a result, *Kapha* and *Medas* become liquefied, which thereby helps in decreasing the amount of accumulated fat in the body. *Swedana* (sudation), which is used just after *Udvartana*, further helps in digestion (*Paka*) of the same. Additionally, it encourages *Swedapravrathana*, which reduces stiffness, heaviness, and coldness in the body, thus aiding in the treatment of *Sthaulya* (obesity).

Figure 7: Combine mode of action of *Udvartana* and *Bhaspaswedana* in *Sthoulya*

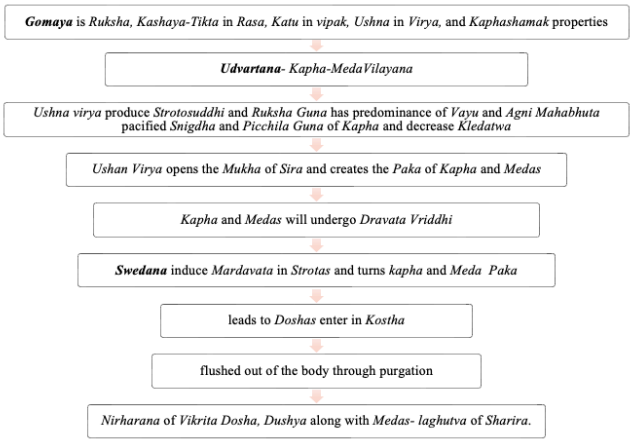
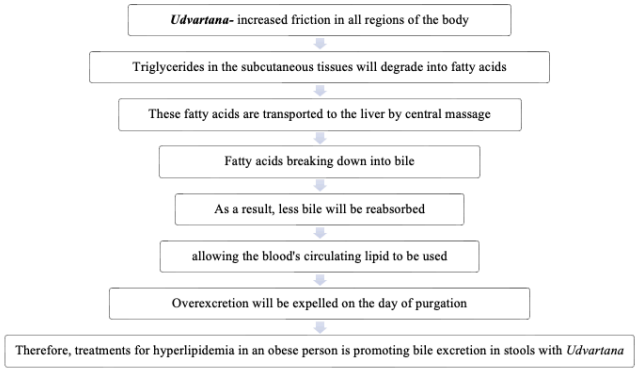


Figure 8: Mode of action of *Udvartana* as per modern view



Rodhradigana is a combination of herbs, and collection of these herbs is a challenge and these are high in cost. Whereas *Gomaya Mashi* is single

substance derived from *Panchagavya*. *Gomaya* is easily available and offers a cost-effective alternative. The use of *Gomaya* helps to build a healthy population, alternative energy source, pollution-free environment, and eradicate poverty. The use of *Gomaya* holds the potential to not only benefit human health but can also enhance the quality of cow' life, especially the older Cows when they cease milk production, as they are often abandoned on roadsides. Hence, the *Gomaya Mashi* emerges as a better option compared to *Rodhradigana*.

Conclusion

From this study, it can be concluded that statistically significant improvement was observed in objective parameters like Body Weight, BMI, waist-hip ratio, Mid Arm circumference, and Abdominal circumference in both groups. Comparison of both the groups demonstrated a statistically high significant difference in objective parameters of Group B i.e. *Gomaya Mashi Udvartana* followed by *Bhaspawedana*. So, it can be concluded that *Udvartana* with *Gomaya Mashi* is more effective than *Udvartana* with *Rodhradi Gana* followed by *Bhaspaswedana* in the management of *Sthoulya* (Overweight) and is an economical alternative without adverse effects. Further study can be conducted on a larger number of patients for a longer duration of time to confirm efficacy.

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