


BREAKING BARRIERS TO WEIGHT LOSS THROUGH COMBINED PROGRAMME OF REFLEXOLOGY AND DIET PLAN

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Abstract : *There are lots of misconceptions about losing weight. Popular media is full of fad diets and magic weight loss potions endorsed by celebrities and supported by personal success stories. Managing weight is a life-long commitment – not just following a diet for a few weeks to drop kilograms. The purpose of this study was to investigate the combined effect of reflexology and diet plan on weight loss. It was hypothesized that significant difference will be observed before and after the combined programme of reflexology and diet plan. For fulfilling the purpose, the data was collected from Dr. Megha's Holistic Healing Centre, Nagpur and its two franchises namely Atharv Holistic Clinic, Amravati and Mrunal Holistic Clinic, Wardha of Maharashtra State, India. Total 19 subjects, 6 males and 13 females, were selected from the centres mentioned above for this study by purposive sampling method, who were enrolled in the month of December, 2021 for the purpose of weight loss. At the time of joining to the centre the pre-test data was collected from the subjects. Then, the subjects were given scheduled diet plan and reflexology program continuously for four months and the post test was conducted subsequently. The collected data was analysed by using paired samples t-test. It was found that the calculated value of 't' of body weight, body mass index, thigh and upper arm girths are greater than the tabulated value of 't' (18) in 0.05 level of significance, which shows there is significant difference between the pre and post-test of mentioned anthropometric variables. So, the researchers' hypothesis is accepted.*

Keywords : *BMI, Waist-hip Ratio, Thigh Girth, Upper Arm Girth.*

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REFLEKSOLOJİ PROGRAMI VE DİYET PLANI İLE KİLO VERMENİN ÖNÜNDEKİ ENGELLERİ AŞMAK

Özet: Kilo verme konusunda yanlış anlaşılan birçok husus vardır. Popüler medya, ünlüler ve kişisel başarı hikayeleriyle desteklenen, moda diyetler ve sihirli kilo verme iksirleriyle doludur. Kilo kontrolü, ömür boyu sürer,; kilo kontrolü, sadece birkaç hafta boyunca kilo vermek için diyet yapmak değildir. Bu noktadan hareketle, mevcut çalışmanın amacı, refleksoloji ve diyet planının kilo kaybı üzerindeki birleşik etkisini araştırmaktır. Refleksoloji ve diyet planının birlikte uygulanmasının, uygulama öncesi ve sonrasında önemli bir fark yaratacağı varsayılmıştır. Bu amaçla, çalışmada kullanılmak üzere veriler Dr. Megha'nın Nagpur'daki Bütünsel Şifa Merkezi'nden ve iki franchise işletmeden ve Hindistan'ın Maharashtra Eyaleti Wardha'sundaki Atharv Bütünsel Kliniği, Amravati ve Mrunal Bütünsel Kliniği'nden toplanmıştır. Yukarıda belirtilen merkezlerden, kasıtlı örnekleme yöntemi ile 2021 Aralık ayında, kilo kaybı amacıyla bu işletmelere kaydolmuş 6 erkek ve 13 kadın olmak üzere toplam 19 kişi seçilmiştir. İlk kayıtlar esnasında deneklerden ön test verileri toplanmıştır. Daha sonra deneklere dört ay boyunca sürekli olarak planlanmış diyet planı ve refleksoloji programı uygulanmıştır ve dört ay sonunda son test yapılmıştır. Toplanan veriler t-testi kullanılarak analiz edilmiştir. Vücut ağırlığı, beden kütle indeksi, uyluk çevresi ve üst kol çevresinin ön ve son test deperleri arasında istatistiksel olarak anlamlı bir fark olduğu ($p < 0,05$) bulunmuştur. Sonuç olarak, uygulanan programın kilo verme düzeyini etkilediği sonucuna ulaşılmıştır.

Anahtar kelimeler: BKİ, Bel-Kalça Oranı, Uyluk Çevresi, Üst Kol Çevresi.

A good physique is a typical sign of a healthy lifestyle or body. It is most probable that a person is 'fit' if he or she does not have excessive fat on his or her face, arms, buttocks, thighs, or tummy (Smith, 2017). However, in today's environment, obesity and its associated consequences affect everyone. Obesity is a cause of a variety of disorders, including metabolic problems (Jiao et al., 2015). So, staying fit and eating healthy is a new revolution that is gaining traction throughout the world. As a result, many people jump on the bandwagon to lose weight or maintain a healthy weight. Surprisingly, diet and exercise aren't the only ways to stay in good shape. There are several approaches to weight loss in order to overcome obesity. People seek pharmaceutical therapy such as prescription medicines, surgery, fitness schedules, diets, and other weight loss options (Urban, 2013). Some of the procedures mentioned above may be dangerous, in the sense that they may cause lasting damage or ill consequences on the body. To prevent

all of these dangers, we should aim to reduce weight in a natural way. Reflexology combined with a suitable and natural eating plan may be the finest choice for successful weight loss among natural therapies.

Reflexology is a non-invasive traditional therapy that balances the body and mind. It's a type of foot massage that attempts to increase health and relaxation by massaging the feet. It can help with weight loss, but if you aren't exercising frequently and eating a good balanced diet, no amount of reflexology will get you to your desired weight. Aside with reflexology, eating the right meals and incorporating exercise into your daily routine will help you lose weight more successfully. Reflexology, sometimes known as 'zone treatment,' is an ancient kind of alternative medicine that has been used for thousands of years (Lakasing & Lawrence, 2010).

Reflexologists deal with the pressure points that correspond to the spleen and digestive organs to help

with weight loss and to do this weight loss reflex points will be stimulated (Longstreet, 2018).

Table 1: Distribution of those included in the study

Dr. Megha's Holistic Healing Centre, Nagpur		Atharv Holistic Clinic, Amravati		Mrunal Holistic Clinic, Wardha	
Male	Female	Male	Female	Male	Female
3	4	2	5	1	4

Acupressure, acupuncture, and reflexology can all be used to activate these sites via needling, pressure, or heat. Acupoint stimulation for weight loss is based on the Chinese meridian theory, which states that obesity is most closely connected to the spleen. If individuals eat too much and exercise too little, the spleen will be unable to convert the food and will lose its body-friendly regulating function, preventing the body from properly absorbing and exploiting nourishment. As a result, fat will store and obesity will result. According to modern medical research, stimulating the relevant acupoints can effectively inhibit the appetite to minimise food intake, restrict stomach and intestinal absorption to reduce energy intake, and increase energy metabolism (Jiao, 2015).

For the evidence about the above fact, Jung et al. (2017) demonstrated in their study that Meridian acupressure massage can speed up the restoration to original body composition after delivery. Lin et al. (2010) also discovered that regulated middle-frequency electrical stimulation can assist postmenopausal women with obesity change their body composition. Finally, Yao et al. (2012) claimed that acupuncture therapy may dramatically lower body mass index (BMI), delay digestion, and regulate hunger in obese individuals, all of which may contribute to its weight loss impact. After 21 days of therapy, He et al. (2014) found that both combination acupuncture and massage, as well as acupuncture alone, lowered body weight and BMI, with the impact being most noticeable in the first four days. According to Arslan et al. (2018), a core fitness programme combined with reflexology is an excellent way to reduce body weight and BMI.

There are very few studies related to the combined effects of reflexology and diet plan on weight loss. Therefore the current study is thought to contribute to the literature.

The purpose of this study was to investigate the combined effect of reflexology and diet plan on weight loss. On the basis of available literature, it was hypothesized that significant difference will be observed before and after the combined programme of reflexology and diet plan.

Methods

The data was collected from Dr. Megha's Holistic Healing Centre, Nagpur and its two franchises namely Atharv Holistic Clinic, Amravati and Mrunal Holistic Clinic, Wardha of Maharashtra State. The study was conducted on the patients who were enrolled in the month of December 2021 for the purpose of weight loss on the above-mentioned centres.

Total 23 patients (7 male, 16 female) were registered for weight loss program in the mentioned centres. But, after few days 4 patients were discontinued the program. So, they are not included in this study. Remaining 19 patients were treated as the subject for this study, as they were continued for four month and follow the given instructions by the doctor.

Total 19 patients (6 male, 13 female) were selected from the above centres for this study (Table 1). The subjects were selected by purposive sampling method. Before starting the program the patients were asked to stop other medications (if they are on) for weight loss. The other health problems of the subjects are not considered in this study. The study has a quasi-experimental one-group pre-test post-test design.

After enrolment of the patients on the above-mentioned centres, the researcher has explained about the purpose of the study and taken written concern from the patients regarding the use of data for further research purpose. The diet plan and the reflexology program (4 months) schedule were fixed for the selected subjects. In this schedule 24 reflexology treatments were given 40 minutes/day by trained reflexologists to the subjects. In this

reflexology treatment the points of liver, spleen, small intestine, pituitary gland and thyroid gland were stimulated in each therapy. Also, regular diet plan was circulated to the subjects one day before for the next day by the doctor of alternative therapy. This diet plan was personalized according to the age, gender, weight

and current health status of the subjects. As the researcher is an associate with this centre for fitness counselling, she was able to control all the factors which are directly related to the result. At the time of joining to the centre the pre-test data was collected from the subjects.

Table 2: Detailed Diet Plan (Vegetarian Diet)

Time	Menu	Ingredients	Kcal. (approx.)	Macro-nutrients involved (approx.)
Breakfast (8:00-9:00)	Boiled egg (2 pcs.)/ boiled or soaked pulses (50 g.)/ mixed veg idli or appe or dhokla (5-6 pcs.)/ sessional fruits/dry fruits (3 types, 3 nuts each) + vegetable salad (compulsory)	Green vegetables, pulses, egg, seeds, fruits	150-200.	50-60% Protein 20-30% Carbs 10% Fat
Lunch (13:00-14:00)	Chapatti (2 pcs.)/ round flatbread (1 piece)/mix veg chapatti(2 pcs.)/mix grain chapatti (2 pcs.) / potato or spinach or fenugreek Leaves or cabbage or paneer paratha (2 pcs.) (no oil) + 1 big bowl of veg curry (no oil) + vegetable salad	Wheat, multi grain, vegetables, paneer	250-300	50-60% Carbs 20-30% Protein 10% Fat
Snacks (16:00-17:00)	Boiled sweet potato/card/butter milk/fruit salad/pulse water/ hotchpotch/soup/ sattu powder	Vegetables, milk, pulse, fruit	150-200	60-70% Carbs 20-30% Protein 5-10% Fat
Dinner (19:00-20:00)	25 g. brown/white rice with soya crunch/ dal khichdi/ milk + 1 bowl of mix vegetable + vegetable salad	Rice, soya bean, pulse, vegetables, milk	100-150	40-50% Carbs 40-50% Protein 10% Fat

The menus mentioned in the above table were personalized and change in daily basis. Beside that the patients are advised to follow the below mentioned points:

- To consume 100 ml green tea 4-5 times a day.
- To take Lukewarm water with a lemon in the early morning and after dinner.
- To take butter milk.
- To take enough drinking water every day.
- The entire menu mentioned above should be prepared with zero oil.
- In every week there should be a detoxification day. On that particular day avoid eating any grain. Only fruits, vegetables are advised.

The above charted diet plan is optimal diet to treat obesity was safe, efficacious, healthy and nutritionally adequate, culturally acceptable and economically affordable, and ensure maintenance of weight loss.

Criterion Measures

Fat is mainly accumulated in abdomen, thigh, buttocks and shoulder. So, to measure the all over body composition researcher selected the following sites to comprehend the weight loss and the researcher considered the following variables for data collection. The variables are shown in Table 3.

Table 3: Body regions selected as data source

Variables	Test/Tools	Unit
Weight	Weighing Machine	kg
Height	Stadiometer	cm
BMI	Body Fat Analyser	kg/m ²
Hip Girth	Steel Measuring Tape	cm
Waist Girth	Steel Measuring Tape	cm
Thigh Girth	Steel Measuring Tape	cm
Upper arm Girth	Steel Measuring Tape	cm

Data Collection

Before taking the measurements calibration of the measuring instruments are done and validity of the instruments was fixed. All the above measurements

were taken at least three times and the average is taken as the final score for the further analysis.

Weight

Measuring body weight is essential for monitoring body fat level. The subject was asked to stand on weighting machine with minimum clothing and bare footed with minimal movement of hands by their side. Then, the weight was recorded in kilograms. (Kansal, 2012)

Height

Most fitness examinations include a measurement of height from the bottom of the feet to the top of the head. The individual was instructed to remove his or her shoes and socks and stand on the platform with his or her feet flat on the platform and heels against the wall where the scale and platform meet. Make sure your head, shoulders, and buttocks are all contacting the scale's wall, and your arms are by your sides. Straighten your back and gaze straight ahead. The chin and line of sight should be parallel to the floor. The height was then measured in metres. (Kansal, 2012)

BMI

After measuring the height and the weight, the formula below was used to calculate the BMI (Kansal, 2012).

$$\text{BMI} = \text{weight (kg)} / \text{height (m)}^2$$

Hip Girth

Girths are circumference measurements taken at certain anatomical spot on the body. The hip girth measurement is the circumference around the hips at the point where the buttocks protrude the most. At the level of the maximum protrusion of the gluteal (buttock) muscles, the hip girth measurement has taken over minimum clothes. The subject was initially informed about the test method. The individual was instructed to stand straight with their weight evenly distributed on both feet and legs slightly apart, with their gluteal muscles relaxed. Now, using the steel tape, the measurement was obtained by securing the

tape to the skin, neither too tight or too loose, and recording in cms (Kansal, 2012).

Waist Girth

The goal of measuring waist circumference is to determine the quantity of abdominal fat (visceral fat). The waist was measured at the narrowest part of the waist, halfway between the bottom rib and the top of the hip bone (iliac crest). The subject was initially informed about the test method. Now, following a normal expiration (since diaphragm movement might modify belly volume), the measurement was obtained by snugging the tape not too tight or too loose on the skin and recording in cms (Kansal, 2012).

Waist-hip Ratio

The WHR was calculated by dividing waist circumference by hip circumference.

Thigh Girth

The underlying musculature and adipose tissue are measured by measuring the circumference of the thigh. The patient was instructed to stand tall, with their weight evenly distributed over both feet and their legs slightly apart. Thigh circumference was measured at the midpoint between the inguinal increase and the proximal border of the patella – the top of the patella – perpendicular to the long axis of the thigh. On the right side of the body, this girth measurement was collected. Now, using the steel tape, the measurement was obtained by securing the tape to the skin, neither too tight or too loose, and recording in cms (Kansal, 2012).

Upper arm Girth

The circumference of the arm is measured to determine the underlying muscles and fat tissue. On the right side of the body, this girth measurement was collected. The circumference was obtained at the midpoint between the acromion (bony point of shoulder) and olecranon (bony point of elbow) processes, with the arm relaxed and hanging by the side. The measurement was taken using a steel tape that was snug but not too tight, resting flat on the skin and recorded in centimetres (Kansal, 2012).

Statistical Analysis

Pre-test was conducted at the time of joining of the subjects to the centre in December 2021. The Subjects were given scheduled diet plan and reflexology program continuously for four months. After four months in April 2022 Post test was conducted subsequently. The collected data was analysed by using t-test.

Results

Table 4 reveals that there is difference between the mean of pre and post-test of selected anthropometric variables i.e., Body weight, BMI, Thigh Girth and Upper arm girth but there is a negligible mean

difference in waist-hip ratio. In body weight the pre-test mean is 79.89, which is greater than the post-test mean i.e., 71.37. Again in BMI, Thigh girth and upper arm girth the pre-test means are 30.09, 57.05 and 30.05 respectively, which all are greater than the post-test means i.e. 26.64, 54.32 and 28.58 accordingly. So, the mean differences are found 8.53, 3.45, 2.74 and 1.47 accordingly. But in waist-hip ratio the pre and post-test means are 0.94 and 0.93 respectively and the mean difference is 0.01 which is negligible. So, to check the significant difference of pre and post-test of each variable the data is again analysed by applying 't' test, before applying 't' test standard deviation is calculated.

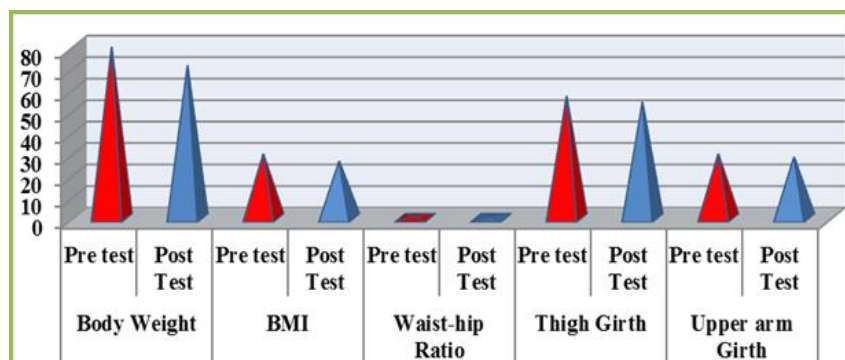
Table 4: Comparison of Anthropometric Variables between Pre and Post Test

Variables	Group	Mean	SD	MD	df	t	p
Body Weight (kg)	Pre-test	79.89	12.91	8.52	18	20.57*	.00
	Post test	71.37	13.43				
BMI (kg/m ²)	Pre-test	30.09	5.45	3.45	18	16.04*	.00
	Post test	26.64	5.33				
Waist-hip Ratio	Pre-test	0.94	0.048	0.01	18	0.79	.22
	Post test	0.93	0.047				
Thigh Girth (cm)	Pre-test	57.05	3.19	2.73	18	13.68*	.00
	Post test	54.32	2.62				
Upper arm Girth (cm)	Pre-test	30.05	4.43	1.47	18	8.32*	.00
	Post test	28.58	4.15				

* $p < .05$

Now, the calculated value of 't' of Body weight, BMI, Thigh girth and upper arm girth are 20.57, 16.04, 13.68 and 8.32 respectively which all are greater than the tabulated value of 't' (18) in 0.05 level of significance, which shows there is significant

difference between the pre and post-test of mentioned anthropometric variables. But, in Waist-hip ratio the calculated 't' is found 0.79, which less than the tabulated 't'(18) i.e. 1.734. So, the researchers' hypothesis is accepted. This is presented graphically in Graph 1.



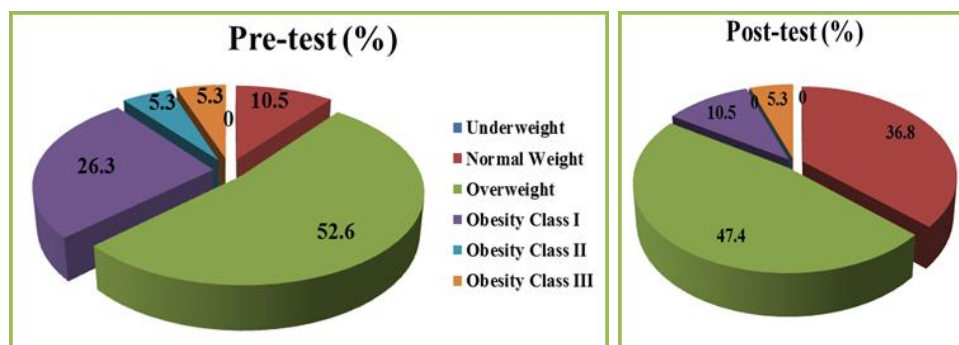
Graph 1: Graphical Representation of Anthropometric Variables between Pre and Post Test

During tabulation of data found that there is remarkable effect of diet plan and the reflexology program (4 months) on various variables of anthropometric measures. Mainly when we talk about weight loss BMI is the main indicator for that. How much percentage of subjects improves by BMI category is shown below. The table indicate that at the time of joining the centre, percentage of subject's BMI

categories are Underweight 0%, Normal Weight 10.5%, Overweight 52.6% ,Obesity Class I 26.3%, Obesity Class II 5.3%,Obesity Class III 5.3% respectively. After the completion of program it is found that the percentage of subjects in normal weight category was increased, whereas the overweight, Obesity class I & Obesity class II was decreased significantly.

Table 5: Categorical Division (Percentage) of BMI in Pre and Post Test

Category	Pre-test (%)	Post-test (%)
Underweight	0	0
Normal Weight	10.5	36.8
Overweight	52.6	47.4
Obesity Class I	26.3	10.5
Obesity Class II	5.3	0
Obesity Class III	5.3	5.3



Graph 2: Graphical Representation of Category of BMI in Pre and Post Test

Discussion

Losing Weight is a challenge in modern and atomization era. Many are still searching for the most effective method to reduce obesity and minimize its' related problems. Choosing the right method is very difficult task for the obese person. Many agencies, different medicine brands, different weight loss programs trying to attract the troublesome persons. Losing weight has become a multi-billion-dollar industry. It's hard to go a day without seeing or hearing about "the answer to" or a "miracle" weight-

loss solution. The sufferers are sometimes fall into the trap and wasting their lot of time as well as money. But, researcher find an efficient way to fight against the burning problem i.e. Obesity and excessive weight gain. In this study both combined Diet plan and reflexology program are proved to be effective for significant weight loss, along with reduce in BMI, Waist-hip ratio, Thigh and upper arm girth and ultimately helpful for reducing obesity. Elbanna et al. (2022) supports this study where we found Reflexology have a substantial impact on enhancing the quality of life in people with obesity. Also,

Soeliman & Azadbakht (2014) indicates that consuming fewer calories helps people to keep weight loss.

In this study near about 8.5 kg (Approximately) weight was reduced within four month of applying the above mentioned method. The effects are varied from subject to subject due to their age, gender, severity of other health problems, seriousness of following the given diet chart and so on. Also, Koliaki et al. (2018) stated that Setting realistic goals for weight loss and pursuing a balanced dietary plan tailored to individual needs, preferences, and medical conditions, are the key principles to facilitate weight loss in obese patients. Very few studies are done (available) on particularly the combined effect of Reflexology and diet plan on weight loss. So, it is keen effort of the researcher to enrich the knowledge of weight loss.

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There is significant effect of diet plan and the reflexology program (4 months) on weight loss. In the result we can see that there are still some subjects are in the overweight and obese category. They may need to continue the schedule for more duration according to their severity of the problem.

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