

EFFECT OF CUMIN POWDER ON OBESITY AMONG ADULTS IN URBAN AREA OF PUDUCHERRY, INDIA

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ABSTRACT

Introduction: *This study aimed to determine the effect of cumin powder on Physical and Biological Parameters among Adults with Obesity in Urban area of Puducherry.*

Material & methods: *In this pre experimental one group pre test and Post test design, 40 adults with obesity, BMI value of ≥ 25 , Total cholesterol $> 200\text{mg/dl}$, age group of 20 to 60 years were selected. After lipid profile assessment 3gm of cumin powder packet with hot water was administered for 70 days (10 weeks). Anthropometric and biochemical parameters were determined before and after the intervention. **Result :** Cumin powder with hot water reduced serum levels of Total cholesterol, BMI was significantly reduced ($p < 0.05$).*

Conclusion: *Cumin powder with hot water showed reduction in anthropometric and biochemical parameters in overweight among adults.*

Key Words: *Over weight, Obesity, Cholesterol, Body Mass Index.*

INTRODUCTION

Overweight and obesity are the fifth leading risk for global deaths and usually means the accumulation of abnormal or excessive fat that may interfere with the maintenance of optimal state of health.⁽¹⁾ Globally, owing to the demographic, economic, social, and nutritional transitions in the past decades, a significant hike in the prevalence of overweight and obesity has been found in almost all age groups. Obesity has reached epidemic proportions globally, with at least 2.8 million people dying each year as a result of being overweight or obese. Once associated with high-income countries, obesity is now also prevalent in low- and middle-income countries. Governments, international partners, civil

society, non-governmental organizations and the private sector all have vital roles to play in contributing to obesity prevention.⁽²⁾

Despite being a commonly encountered medical problem, obesity poses challenges in treatment. Many Indian physicians find themselves to be lacking time and expertise to prepare an appropriate obesity management plan and patients experience continuous weight gain over time despite being under regular medical supervision. There is an immediate need to address the burden of obesity, the greatest risk factor contributing to non-communicable diseases.⁽⁴⁾

Obesity is a medical condition which occurs due to accumulation of excess body fat to an extent that results negative effect in health. Obese are generally known when the body mass index (BMI) of a person is above 25. According to World health organization obesity and corpulent are defined as a risk of body health due to over or abnormal accumulation of fat in a human body.

The present study was conducted to determine the Effect of Cumin Powder among Adults with Obesity in urban area of Puducherry. Studies have highlighted the role of variable parameters like physical activity, diet, smoking, BMI, Body Fat, Visceral Fat and Total Cholestrol in the process of development of obesity.

MATERIALS AND METHODS

In this study, pre experimental one group pre test and Post test design is used to find the effectiveness of cumin powder on obesity among adults.

Pre Test	Intervention	Post Test
Blood samples for lipid profile was drawn from the selected study participants in an empty stomach at PHC	Participants were consumed 3gm of cumin powder mixed with hot water in the early morning in an empty stomach for a period of 10 weeks.	After 10 weeks Blood samples for lipid profile was drawn from the selected study participants in an empty stomach at PHC.

Based on the survey the 40 participants randomly selected with Confident level of 90%, Margin error of 10% among total population of 93 adults with obesity, who have BMI value of $\geq 24\text{kg/m}^2$ based on ICMR classification⁽⁵⁾, total cholesterol above 200mg/dl and the age group between 20 to 60 years of both genders were selected after a clinical survey at muthialpet urban area of Puducherry, India. The individuals who have chronic illness includes metabolic disorders, hormonal imbalances and cardio vascular disorders, learning difficulties and who cannot read and write English and Tamil were excluded from the study. Ethical clearance was obtained from Institutional Review Board, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry permission was obtained from Directorate of Health and Family Welfare services, Puducherry.

Tool consists of two parts, part I, Part II and Part III

Part-I : Consist of Personal Identification Data: include Participant ID, address and form number. Demographic data include Age, Gender, Educational status, Occupation, Family Monthly income, Religious, Marital Status, type of family, Dietary pattern, Type of worker, Family history.

Part-II: Questionnaire to assess the associated risk factors of the study variables

1. **Life style:** Rice Items, Wheat Items, Raagi/Milet Items, Mida items, Vegetables, Non veg, fast foods
2. **Physical Activity:** Walking, Slow jogging Running Exercise , Sitting, Standing
3. **Personal Behavior:** Smocking, Chewing, Tobacco, Alcohol
4. **Family History:** Obesity, Dyslipidemia Cardiovascular Disease, Diabetes, Thyroid

Part –III : Observation schedule to assess the effectiveness of cumin powder on selected bio-physiological parameters of obesity.

1. Physiological Measurements

Tools	Physiological measures
Omron HBF 212 body composition monitor.	BMI, body fat percentage, visceral fat level and skeletal muscle percentage

2. BIOLOGICAL MEASUREMENTS:

- **Lipid profile:** Total cholesterol value in mg/dL (milligrams per deciliter) and are based on fasting measurement. (Indian Heart Association, 2019).⁽⁶⁾

Level	Total cholesterol
Good	Less than 200 (but the lower the better)
Borderline High	200 and 239 mg/dL
High	240 mg/dL and above

Data collection was done on following phase,

Phase I : Formal permissions were acquired from the Directorate General Health Services, Government of Puducherry. From 27.03.19 to 31.03.19, biological measurements were assessed for 56 participants. After 12 hrs of fasting, 5 ml blood was taken from all the people to Measure, total cholesterol. Among 56 adults High risk assessments, 40 participants were selected who have BMI value of 25 and above, total cholesterol above 200mg/dL, and the age group between 20 to 60 years of both genders and without co-morbid conditions such as hypertension, Diabetes and stroke and also those who are willing to participate in this study was included in the study. Weight (kg) (no shoes, minimum clothing) was measured on a calibrated scale (with accuracy of 0.1Kg), and height (within 0.1cm) and Waist circumferences were measured using an anthropometric tape measure with accuracy of 0.1 cm.

Phase II: Data was collected from the period of 3.4.19 to 4.6.19 The details of the study was explained clearly in Tamil Language before enrolling the Participants into the Study. Written Consent in Tamil was obtained from the 40 study participants. 3g of Cumin Powder with hot water was given based on the previous study⁽⁷⁾. Description of Intervention and tracking sheet procedure was explained to the study participants on the spot. Cumin Powder (3g) Packet (50 microns insect proof Polyethylene food product storage cover) was distributed to for 7 days on spot and remaining days distributed through home visit. Follow up was done through Mobile phone and Home visit.

Phase III: Post test was conducted on 70thday (10 weeks) (3.4.19 to 4.6.19) for the period of 4 days. In Post test 40 study participants gave blood samples for testing; all study participants

were had follow up, none of them were dropped out. Pre and Post intervention biological measurements were documented. No complaints were reported by clients and they continued the treatment for 10 weeks.

RESULTS

The distribution of participants according to the demographic variables shows that, Majority of the participants were 41 - 50 years of age, married and had under graduate education. Most of the participants were living in nuclear family and non vegetarian food pattern. And all the participants were belong to Sedentary type of workers.

Figure 1 shows the distribution of participants according to the Life Style & Risk Behavior such as diet, physical activity, personal behavior and family history. Results revealed that 50% of participants in pre test were changed the life style behaviors due to that 50% of participants risk factors was become Mild from Moderate risk factor.

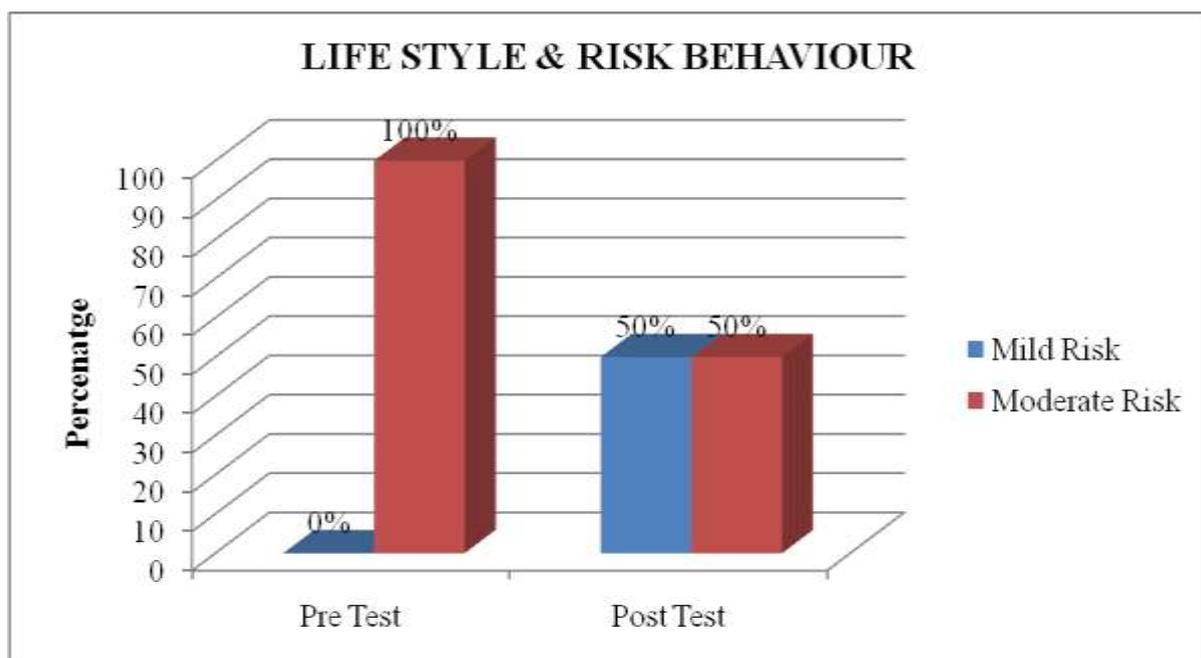


Figure 1 : Distribution of participants according to the Life Style & Risk Behavior

Table 1: Comparison of effect of cumin power on Physical Parameters among the adults with obesity in pre and post test

Physical Parameters	Pre – Test		Post – Test		Z - Value	p-Value
	Mean	SD	Mean	SD		
BMI	27.150	2.1068	26.125	1.814	-3.317	0.001*

Body Fat	39.775	3.050	37.775	3.214	-4.123	0.000*
Visceral Fat	26.525	3.426	24.875	3.065	-1.897	0.109

* $p < 0.001$ statistically High Significant

Table 1 shows that Comparison of effect of cumin power on Physical Parameters among the adults with obesity in pre and post test. With regard to Body Mass Index, pre test mean & SD is 27.150 & 2.106 respectively, the post test mean & SD is 26.125 & 1.814 and Wilcoxon Signed Ranks Test 'z' value of 3.403 with significance of $p < 0.001$. With regard to Body Fat Percentage, the pre test mean & SD is 39.775 & 3.05 respectively, the post test mean & SD is 37.775 & 3.214 and Wilcoxon Signed Ranks Test 'z' value of -4.123 with significance of $p < 0.000$. With regard to Visceral Fat Percentage, the pre test mean & SD is 26.525 & 3.426 respectively, the post test mean & SD is 24.875 & 3.065.

Table 2: Comparison of effect of cumin power on Biological Parameters among the adults with obesity in pre and post test

	Pre – Test		Post – Test		Z-Value	p-Value
	Mean	SD	Mean	SD		
Lipid Levels						
Total Cholesterol	226.425	18.89	192.7	22.55	-4.767	0.000*

* $p < 0.000$ statistically High Significant

Table 2: Comparison of effect of cumin power on Biological Parameters among the adults with obesity in pre and post test. Pre Mean cholesterol level was 226.425 mg/dl with SD of 18.89 in Post interventional Mean Lipid levels was 192.7 mg/dl with SD of 22.55. The comparison of Cholesterol level in Pre test and Post test level is highly significant at $p < 0.000$, it shows that, the effectiveness of cumin power in decreasing the level of cholesterol among patients.

DISCUSSION (A) SUMMARY OF KEY FINDINGS:

In this study, With regard to Life Style & Risk Behavior such as diet, physical activity, personal behavior and family history, the results revealed that 50% of participants in

pre test were changed the life style behaviors due to that 50% of participants risk factors was become Mild from Moderate risk factor.

Lifestyle choices in the 21st century are frequently centered on individual and family activities of expediency, rather than sound diets and wellness, and have resulted in an obesogenic (environmental conditions that encourage excess weight gain) and chronic disease culture that is responsible for the deteriorating health in today's children and future Adults.⁽⁸⁾

In this present study, With regard to Comparison of effect of cumin powder on Physical Parameters such as BMI, Body fat and Visceral Fat percentage among the adults with obesity in pre and post test. With regard to Body Mass Index, pre test mean & SD is 27.150 & 2.106 respectively, the post test mean & SD is 26.125 & 1.814 and Wilcoxon Signed Ranks Test 'z' value of 3.403 with significance of $p < 0.001$. With regard to Body Fat Percentage, the pre test mean & SD is 39.775 & 3.05 respectively, the post test mean & SD is 37.775 & 3.214 and Wilcoxon Signed Ranks Test 'z' value of -4.123 with significance of $p < 0.000$. With regard to Visceral Fat Percentage, the pre test mean & SD is 26.525 & 3.426 respectively, the post test mean & SD is 24.875 & 3.065.

A similar study conducted on effect of cumin cyminum plus lime water in reducing overweight. 50 (25 experimental group and 25 control group) women's who met the inclusion criteria were selected by using non probability convenience sampling technique. After selecting the sample, the investigator explained the purpose of the study and informed consent was obtained. Demographic variables were collected pretest was done by using BMI for both experimental and control group. For experimental group, cumin cyminum plus lime water given for 3 weeks on early morning in empty stomach. The data were tabulated and analyzed by descriptive and inferential statistics. The calculated 't' value is significant at $P < 0.005$. The study indicates that administration of cumin cyminum plus lime water is effective in reducing overweight. The present study showed that cumin cyminum plus lime was not only beneficial but also safe and effective in the treatment of obesity.⁽⁹⁾

In this present study, With regard to the comparison of Total Cholesterol level in Pre test and Post test level is highly significant at $p < 0.000$, it shows that, the effectiveness of cumin powder in decreasing the level of cholesterol among patients.

Zare et al conducted a study to determine the effect of cumin powder on body composition and lipid profile in overweight and obese women. In that randomized clinical trial, 88 overweight/obese women were randomly assigned into two groups. The

experimental group was asked to have 3 g/d cumin powder with yogurt at two meals for 3 months. The same amount of yogurt minus cumin powder was prescribed for the control group. All patients received nutrition counseling for weight loss in a similar manner. Anthropometric and biochemical parameters were determined before and after the intervention. Results revealed that Cumin powder reduced serum levels of fasting cholesterol, triglyceride, and LDL and increased HDL. Weight, BMI, waist circumference, fat mass and its percentage significantly reduced. It has no effect on FBS and fat-free mass. Cumin powder in a weight reduction diet showed improvement in anthropometric and biochemical parameters in overweight/obese women.⁽⁷⁾

Andallu B, Ramya V investigated the anti-hyperglycemic, cholesterol-lowering and HDL-raising effects of cumin (*Cuminum cyminum*) seeds-a non toxic natural therapeutic agent, in type 2 diabetes. The therapeutic effects of cumin seeds were evaluated by comparing with antidiabetic drug in type 2 diabetes patients. A total of 20, type 2 diabetes patients were divided into control and experimental groups consisting of 10 each and treated with anti-diabetic drug and cumin seed (commonly used spice) powder (5g/day) respectively for 60 days. Results revealed that Patients with cumin seed therapy significantly improved their glycemic control as evidenced by significantly decreased levels of fasting glucose levels, showed significantly decreased levels of cholesterol (47%, pCuminum cyminum seeds exhibited anti-hyperglycemic, cholesterol lowering and HDL-raising effects in type-2-diabetes and the efficacy of cumin seeds was proved to be superior to the drug in ameliorating the abnormalities in lipid profile in diabetes patients.⁽¹⁰⁾

(b) Strengths and Limitations of the study: The Present study demonstrated that the Cumin powder has effect on cholesterol level among adults with obesity in urban areas, Puducherry. Ten week of intake of cumin powder with hot water results that there was significant Decreases in Total cholesterol by 33.725 mg/dl ($p < 0.000$). Result showed that the cumin powder with hot water is effective in reducing Total cholesterol and BMI.

Limitations : Regarding the limitation of our study, we can point to the study group which consisted of overweight adults. So, the results could not be generalized to other groups.

(c) Interpretation and implications: Recent studies indicate cumin may be effective in lowering cholesterol and in weight loss. Cumin may be helpful for people trying to lose weight. A study involving overweight adults compared the effects of cumin with a weight-loss medication and a placebo on weight. After 8 weeks, the researchers found that the cumin

and weight-loss medication groups both lost significant amounts of weight. People in the cumin group also experienced a decrease in their insulin levels.

Another study found that overweight and obese women who consumed 3 grams (g) of cumin powder in yogurt daily for 3 months had significant decreases in body weight, waist size, and body fat. This study similar to present study, overweight and obese women also found that consuming 3 g of cumin powder per day resulted in lower total cholesterol levels.

(d) Controversies raised by this study: No controversies was raised by this study.

(e) Future research directions:

Investigating the effect of cumin among different group of people such as diabetic and dyslipidemic patients with various doses, measuring various lipid profiles, Parameters, effect of cumin power in Kidney function, Liver function and duration will give better results.

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