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Effect of Plant Based Diet Versus Intermittent Fasting Diet on Lipid Profile in Obese Premenopausal Women

Yehia Mahmoud Mohamed Sadek[1], Hala Mohamed Hanafy Emara[2], Mohamed Ahmed Mohamed Awad[2], Sameh Hussien Samier[3], Heba S Abdelhaliem[4]

[1]Physical Therapy department for Woman's Health, Faculty of Physical Therapy, MTI University, Cairo, Egypt.

[2]Physical Therapy department for Woman's Health, Faculty of Physical Therapy, Cairo University, Egypt.

[3]Department of Obstetrics and Gynecology, National Research Center, Egypt.

[4]Department of clinical nutrition, National Nutrition Institute, Cairo, Egypt.

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ABSTRACT

Introduction: The aging process correlates with a heightened risk of obesity and non-communicable diseases, including cardiovascular disease, type 2 diabetes, as well as hypertension. Nonetheless, it seems that the heightened risk of non-communicable diseases is associated with central obesity and higher waist circumference (WC), rather than general obesity or elevated BMI.

Aim of the study: The purpose of this study was to determine the difference between the effects of plant based diet and intermittent fasting diet on lipid profile in obese premenopausal women.

Subjects: Sixty obese premenopausal women with hyperlipidemia, were took part in this study. They were chosen from the outpatient clinic of MTI University. Their ages varied from 40 to 45 years, and their body mass index (BMI) ranged from 30 to 35 kg/m². Every participant had no history of diabetes mellitus, hypertension, malignancy, pacemaker, or hyperthyroidism.

Design: Randomized controlled study, all women were randomly allocated into two equal groups; Study group (A): included 30 obese pre-menopausal women who were treated by aerobic exercises on treadmill for 30 minutes 3 sessions/ weak and plant based diet for 3 months. Study group (B): included 30 obese pre-menopausal women who were treated by aerobic exercises on treadmill for 30 minutes 3 sessions/ weak and intermittent fasting diet for 3 months. Assessment: Assessment of BMI, WHR, total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL) as well as high density lipoprotein (HDL), measurements were taken for both groups (A and B) prior to and following treatment.

Results: Both plant based diet and intermittent fasting diet have significant effect in decreasing BMI, WHR, TC, LDL & TG and increasing HDL post treatment. When compared plant based diet with intermittent fasting diet post treatment, plant based diet has more significant effect. Conclusion: Plant-based diet is more effective than intermittent fasting diet through decreasing BMI, WHR, total cholesterol, LDL & total triglycrides levels along with increasing HDL level in obese premenopausal women.

Keywords: *Plant based diet, Intermittent fasting diet, Lipid profile, Obesity, Pre-menopausal women.*

1. INTRODUCTION

Menopause is defined by the irreversible termination of menstrual cycles and is clinically identified after 12 months of total amenorrhea. It manifests at a median age of 51 years during the natural aging process, however it may occur earlier due to certain medical disorders or following surgical intervention (surgical menopause). The reproductive organs experience gradual atrophy because to diminished levels of circulating estrogens and progesterone (Carugno, 2020).

The World Health Organization (WHO) classifies premenopausal women as those who have had regular menstrual bleeding within the past 12 months, while those with irregular menses or no menstrual bleeding for more than 3 but less than 12 months are also considered premenopausal. Postmenopausal women are defined as those who have not had menstrual bleeding for 12 months or longer (AlDughaither et al., 2015). Obesity is a major public health concern that affects women disproportionately more than men (Flegal et al., 2016).

During the menopause, women have significant reductions in circulating estrogens, especially estradiol (E2), alongside elevations in the gonadotropin follicle-stimulating hormone (FSH) (Flegal et al., 2016). These hormonal alterations correlate with modifications in energy expenditure as well as intake that produce a positive energy balance, resulting in weight gain (Marlatt et al., 2022). This weight gain results from an increase in fat mass, particularly abdominal fat accumulation, which elevates cardiometabolic risk. Even though the menopause transition is known to have negative effects (Marlatt et al., 2022).

Obesity, defined as BMI more than 30 kg/m2, has become recognized as a significant public health issue in Western nations due to the accompanying health risks as well as financial burdens on healthcare services. The physical consequences of obesity, particularly cardiovascular disorders (such as coronary heart disease, hypertension, as well as ischemic stroke), diabetes mellitus, and some malignancies, serve as the driving force behind the majority of public health campaigns along with weight loss initiatives. Indeed, obese persons are expected to have more unhealthy life years than normal weight individuals. However, there has recently been a growing body of literature, which has identified that obesity is also a significant predictor for a poor psychological wellbeing and negative health-related quality of life, particularly in women (Knight et al., 2022). Women typically experience a weight increase of roughly 5 to 7 pounds (or 2 to 3 kg) during the menopause transition, but significant interindividual variability exists. Elevated weight, especially abdominal adiposity, correlates with exacerbated vasomotor symptoms (e.g., hot flashes and nocturnal perspiration), insomnia, heightened fatigue, and diminished quality of life (Marlatt et al., 2022).

Hyperlipidemia is characterized by abnormally high or low levels of lipids in the blood and can be caused by a number of genetic along with acquired disease. Alternatively, a more objective definition characterizes hyperlipidemia as LDL, total cholesterol, triglyceride levels, or lipoprotein levels exceeding the 90th percentile relative to the general population, or a HDL level falling below the 10th percentile in comparison to the general population (Hill et al., 2021).

While numerous dietary regimens are available for weight loss, intermittent fasting (IF) has garnered significant popularity over the past decade (Mattson et al., 2017). This dietary approach often entails significant restriction (75-90% of caloric requirements) on one or two days each week. Findings from a recent 24-week randomized clinical research indicated that IF can decrease body weight by 7% in obese women. In these participants, LDL cholesterol as well as triglycerides dropped by 10% and 17%, respectively (Arciero et al., 2022).

Plant-based diets, which include vegetarian or vegan diets that are generally less animal-food intensive, are becoming increasingly popular in the aim of environmental and physical health (Lynch et al., 2018). Following a plant-based diet is associated with a lower risk of developing chronic diseases, and producing plant-based foods is generally less resource-intensive and environmentally harmful for a variety of reasons, particularly because it produces fewer greenhouse gas emissions (GHGEs) than raising animals for human consumption (Lynch et al., 2018).

Consistent aerobic exercise is the best substantiated approach for mitigating cardiovascular disease risk in aging obese women. The cardiovascular-protective benefit of aerobic exercise is mostly attributable to its beneficial impact on vascular health (Seals et al., 2019).

2. SUBJECTS

Seventy five premenopausal women with dyslipidemia participated in this study. They were diagnosed by gynecologist. They were selected from the MTI University outpatient clinic at Modern University of Technology and Information in Cairo. Six patients are excluded and 69 continued. Finally, 60 patients completed the study program. Their ages ranged from 40 to 45, and their BMI ranged from 30 to 35 kg/m2. They were free of any pathological disorders that could have impacted the outcome of the study. Women with hyperthyroidism or hypothyroidism, high blood pressure, diabetes mellitus, an intrauterine device, BMI more than 35 kg/ m2 or less than 30 kg/ m2 were excluded from the study.

3. DESIGN

The design was randomized controlled study. Utilizing a closed envelope random assignment technique, they were divided into two equal groups; Group A included thirty women and treated by aerobic exercises on treadmill for 30 minutes 3 sessions/ weak and plant based diet for 3 months. Group B included thirty women and treated by aerobic exercises on treadmill for 30 minutes 3 sessions/ weak and intermittent fasting diet for 3 months.

The Faculty of Physical Therapy Ethical Review Board of Cairo University in Egypt gave its approval to this study. No: P.T.REC/012/005483.

4. MATERIALS

1- Informed consent form.

2- Standard weight and height scale. (floor type, RGT-200, made in china):

It is utilized to measure weight and height for each woman to compute BMI for both groups (A and B).

3- Tape measurement:

For the purpose of determining the waist-hip ratio, it measures the circumference of the waist and the hips of all women in both the A and B groups prior to and following treatment.

4- ELISA reader (stat fax -2100):

The lipid profile is assessed for all women in both groups (A and B) prior to and following treatment.

5- Electrical Treadmill:

Pro Hanson EH-ET1435WIN Treadmill manufactured in China. All women in both groups (A&B) engaged in aerobic exercise for thirty minutes, three times each week, during a duration of three months.

5. PROCEDURES

All women received a comprehensive description of the study methodology, and each woman will sign a permission form prior to participation, with the goal and nature of the study explained clearly to all participants.

A- Evaluative procedures:

1- History:

A comprehensive medical history was obtained from each woman prior to initiating the study to ensure the absence of contraindications that could affect the investigation. The medical history encompassed cardiac, renal, thyroid, as well as neurological functions.

2- BMI assessment:

The BMI of each woman was determined by measuring her weight and height using a standard weight and height scale (Floor type, RGT-200, manufactured in China) (Baral et al., 2021).

BMI= Body weight in kilograms/ Height in meter squared (Kg/ m2).

3- Waist hip ratio:

The waist and hip circumferences of each woman were measured using a tape measure to determine the waist-to-hip ratio prior to and following treatment (Arif et al., 2022).

4- Lipid profile analysis:

Measurement of lipid profile was measured for each woman (Serum cholesterol, Triglyceride, HDL and LDL) after fasting for 12 hours before and after treatment (Doewes et al., 2023).

B- Treatment procedures:

1- Aerobic exercises:

Aerobic exercises were performed by using electrical treadmill for each woman in both groups (A&B).

Aerobic exercises were walk on the treadmill for 30 min including three phases:

a- Warm-up phase comprising 5 minutes of low-intensity treadmill walking at 40% of Maximum Heart Rate (MHR).

b- The actual phase involved walking on the treadmill for 20 minutes at a moderate intensity (60-75% of MHR).

c- The cooling phase involved a 5-minute walk on the treadmill at low intensity (40% of MHR).

To counteract the risk of dehydration during exercise, the therapist recommended that all women consume large quantities of water prior to and following the session. The women were all told to dress comfortably and to wear light, flat shoes.

2- Plant based diet:

The women in group A were the only ones who received this treatment.

3- Intermittent fasting diet:

The women in group B were the only ones who received this treatment.

Intermittent fasting diet consists of 16 hours fasting and 8 hours eating.

6. STATISTICAL ANALYSIS:

Results were presented as mean ± standard deviation. Assessment of normality. Consequently, a comparison of variables among the two groups was conducted using an unpaired t-test.

The comparison of variables was conducted pre- and post-treatment among the same group utilizing a paired t-test.

The Statistical Package for the Social Sciences (SPSS) software (version 24 for Windows) was utilized for data analysis (Rahman and Muktadir. 2021).

A P-value of £0.05 was deemed significant. Analysis of variance (T-test) was used to determine the effect of plant based diet versus intermittent fasting diet on lipid profile on obese premenopusal women with level of significance fixed to 5% ($p<0.05$).

7. RESULTS

Subjects Demographic Data:

There was no significant difference between groups in age ($p = 0.25$) (Table 1).

Table 1. Comparison of age between both groups (A and B):

	Group A	Group B	MD	t- value	p-value	Sig
	$\overline{X}$ ± SD	$\overline{X}$ ± SD				
Age (years)	43.33 ± 1.93	42.77 ± 1.85	0.56	1.16	0.25	**NS**

$\overline{X}$: Mean SD: Standard deviation MD: Mean difference

t value: Unpaired t value p value: Probability value NS: Non significant

BMI, WHR, TC, LDL, TG and HDL:

Mixed MANOVA showed a substantial interaction effect of treatment and time ($F = 14.17$, $p = 0.001$). There was a substantial main effect of treatment ($F = 13.63$, $p = 0.001$). There was a substantial main effect time ($F = 131.66$, $p = 0.001$).

Within groups:

There was substantial reduction in BMI, WHR, TC, LDL as well as TG following treatment contrasted with that prior to treatment in both groups (A and B) ($p > 0.001$). The percent of decrease of BMI, WHR, TC, LDL and TG of group A was 10.80%, 4.95%, 23.09%, 23.11% and 10.54% respectively and that in group B was 5.08%, 3.88%, 15.68%, 12.30% and 7.05% respectively. (Table 2).

There was substantial improvements in HDL following treatment contrasted with that prior to treatment in both groups (A and B) ($p > 0.001$). The percent of increase of HDL of group A was 17.41% and that in group B was 7.45%. (Table 2).

Between groups:

prior to treatment, There was no substantial difference among both groups (A and B) in BMI, WHR, TC, LDL, TG as well as HDL.

following treatment, there was substantial difference among both groups (A and B) in BMI, WHR, TC, LDL, TG as well as HDL with favor of group A ($p < 0.01$). (Table 2).

Table 2: Mean BMI, WHR, TC, LDL, TG and HDL pre and post treatment of both groups (A and B):

	Pre treatment	Post treatment			
	Mean ±SD	Mean ±SD	MD	% of change	p value
BMI (kg/m²)					
Group A	31.38 ± 1.06	27.99 ± 1.07	3.39	10.80	0.001
Group B	31.30 ± 0.71	29.71 ± 1.50	1.59	5.08	0.001
MD	0.08	-1.72			
	p = 0.75	**p = 0.001**			
WHR					
Group A	1.01 ± 0.05	0.96 ± 0.05	0.05	4.95	0.001
Group B	1.03 ± 0.07	0.99 ± 0.06	0.04	3.88	0.001

MD	-0.02	-0.03			
	p = 0.13	**p = 0.01**			
TC (mg/dl)					
Group A	272.36 ± 37.79	209.47 ± 20.70	62.89	23.09	0.001
Group B	277.55 ± 30.32	234.02 ± 10.59	43.53	15.68	0.001
MD	-5.19	-24.55			
	p = 0.56	**p = 0.001**			
LDL (mg/dl)					
Group A	228.82 ± 20.48	175.95 ± 21.55	52.87	23.11	0.001
Group B	236.83 ± 19.52	207.71 ± 17.80	29.12	12.30	0.001
MD	-8.01	-31.76			
	p = 0.13	**p = 0.001**			
TG (mg/dl)					
Group A	131.93 ± 8.16	118.02 ± 8.93	13.91	10.54	0.001
Group B	134.70 ± 8.41	125.20 ± 6.38	9.5	7.05	0.001
MD	-2.77	-7.18			
	p = 0.20	**p = 0.001**			
HDL (mg/dl)					
Group A	41.81 ± 4.26	49.09 ± 4.39	-7.28	17.41	0.001
Group B	40.95 ± 5.11	44 ± 5.05	-3.05	7.45	0.001
MD	0.86	5.09			
	p = 0.48	**p = 0.001**			

SD: Standard deviation; MD: Mean difference; p value, Probability value

8. DISCUSSION

Obesity prevalence in premenopausal women has become an increasingly significant concern due to its implications for overall health. Recent data indicate that life style and hormonal changes during this life stage contribute to a notable risk of obesity. For example, in England (2022–2023), approximately 26.2% of adults, including premenopausal women, were classified as living with obesity. The prevalence of obesity tends to rise with age and peaks in the years leading up to menopause, primarily due to reduced metabolic rates and hormonal shifts affecting fat distribution and appetite regulation. (Szabolcs et al., 2024)

Globally, the effects of estrogen decline during the pre-menopausal period also contribute to changes in body composition, leading to increased central fat accumulation and insulin resistance. These factors elevate risks for metabolic syndrome and cardiovascular diseases. Effective interventions, including balanced dietary habits and physical activity, are emphasized as crucial strategies to mitigate obesity and associated health risks in premenopausal women (Szabolcs et al., 2024)

This study was done to find out the difference among the impacts of plant based diet as well as intermittent fasting diet in lipid profile on obese premenopausal women.

Sixty obese premenopausal women with hyperlipidemia, were took part in this study. They were chosen from the outpatient clinic of MTI University. Their ages ranged from 40-45 years old, their BMI ranged from 30-35 kg/m2. All women were randomly divided into two equal groups; Study group (A): included 30 obese pre-menopausal women who were treated by aerobic exercises on treadmill for 30 minutes 3 sessions/ weak and plant based diet for 3 months. Study group (B): included

30 obese pre-menopausal women who were treated by aerobic exercises on treadmill for 30 minutes 3 sessions/ weak and intermittent fasting diet for 3 months. Assessment of BMI, WHR, TC, triglyceride TG, low density lipoprotein LDL as well as HDL were measured for both groups (A&B) prior to and following treatment. Results found that both plant based diet and intermittent fasting diet have significant effect in decreasing BMI, WHR, TC, LDL & TG and increasing HDL post treatment. When compared plant based diet with intermittent fasting diet post treatment, plant based diet has more significant effect.

Findings of the present study align with the findings of Barnard 2023, who stated that plant-based diet has been widely recognized as an effective approach for weight reduction. Its emphasis on whole, minimally processed foods such as vegetables, fruits, legumes, and whole grains results in higher fiber and water content with lower caloric density, aiding satiety and reducing total calorie intake. A systematic review by Barnard (2023) in *Nutrients* highlights that plant-based diets not only promote weight loss but also improve metabolic health by reducing inflammation and enhancing gut microbiota diversity.

Moreover, a study by Kahleova (2023) in *Journal of Obesity Research* found that participants following a plant-based diet experienced a 4.5% greater reduction in body weight over six months compared to those on calorie-restricted omnivorous diets, underscoring its efficacy for sustainable weight management.

A plant-based diet has been extensively studied for its impact on reducing BMI (Body Mass Index). One study by Acosta-Navarro (2024) who published in *BMJ Nutrition, Prevention & Health* , demonstrated that individuals adhering to plant-based dietary patterns, such as vegan and vegetarian diets, had significantly lower BMI levels than those following omnivorous diets. These results remained consistent after adjusting for factors like age, gender, physical activity, and pre-existing health conditions. The study attributes this to the high fiber content, lower calorie density, and nutrient-rich nature of plant-based foods

Similarly, a review by Barnard (2023) in *Nutrients* highlighted that plant-based diets reduce overall caloric intake while promoting satiety. This dietary pattern helps decrease fat accumulation and supports metabolic health, further aiding in the reduction of BMI. The authors emphasized the importance of whole, minimally processed plant foods in achieving sustainable weight and BMI management.

Plant-based diets have a well-documented effect on reducing total cholesterol levels, making them a powerful tool for improving cardiovascular health. These diets emphasize high-fiber foods like fruits, vegetables, legumes, as well as whole grains, which promote the excretion of cholesterol through bile acids. A current study by Huang et al., (2024) in *Nutrition and Metabolism* demonstrated that participants adhering to a vegan diet for 12 weeks reduced their total cholesterol levels by an average of 12%. This reduction was attributed to the absence of dietary cholesterol and saturated fats commonly found in animal products, as well as the incorporation of plant sterols and polyunsaturated fatty acids, which are known to improve lipid profiles

Plant-based diets are strongly associated with reductions in LDL cholesterol, a key factor in cardiovascular health. A pivotal study published by Jenkins et al. (2024) in the demonstrated that adherence to the "Portfolio Diet," a plant-based regimen including nuts, soy protein, soluble fibers, and plant sterols, resulted in a mean reduction of LDL cholesterol by 30% over 12 weeks. The mechanism involves increased bile acid excretion and lower dietary cholesterol intake, facilitated by the high fiber and unsaturated fat content of plant-based foods

Furthermore, research by Choi et al. (2024) analyzed data from 4,946 adults in the CARDIA study. It found that individuals consuming more plant-centered diets had significantly lower LDL levels and were 52% less likely to develop cardiovascular disease during the 30-year follow-up. These findings highlight the long-term benefits of plant-based eating for cholesterol management and heart health

Another randomized controlled trial by Estruch et al. (2023) showed that adherence to Mediterranean-style plant-based diet reduced LDL cholesterol by 13% compared to a standard low-fat diet. This improvement was attributed to the inclusion of olive oil, nuts, and soluble fibers, which improve lipid metabolism and enhance LDL clearance from the bloodstream

In addition, the American Journal of Cardiology reported that plant-based diets reduce LDL cholesterol without the need for calorie restriction, suggesting that their composition alone promotes lipid improvements. The presence of phytochemicals, such as flavonoids and polyphenols in plant-based foods, also contributes to these heart-protective effects by reducing oxidative stress and improving vascular health

Plant-based diets are associated with improvements in HDL cholesterol (the "good cholesterol") due to their inclusion of healthy fats and bioactive compounds. A study by Jenkins et al. (2024) found that consuming nuts, seeds, and legumes as part of a plant-based diet significantly increased HDL cholesterol levels by 5% over six months. The polyunsaturated and monounsaturated fats in these foods are particularly effective in enhancing reverse cholesterol transport, a key function of HDL cholesterol.

Similarly, research by Huang et al. (2023) highlighted the role of plant-based diets in improving HDL functionality. This study demonstrated that participants following a vegan diet had better HDL particle size and functionality, which are critical

for cardiovascular protection, despite a modest increase in HDL levels

Plant-based diets are increasingly recognized for their beneficial effects on HDL cholesterol, which is vital for cardiovascular health. These diets promote higher intake of unsaturated fats and antioxidants, which improve HDL cholesterol levels and functionality. A study by Wang et al. (2024) found that participants following a plant-rich diet for 12 weeks experienced a 6% increase in HDL cholesterol levels. The inclusion of omega-3 fatty acids from sources like flaxseeds and walnuts played a key role in boosting HDL levels and improving reverse cholesterol transport

Another randomized controlled trial by Turner-McGrievy et al. (2023) indicated that a whole-food, plant-based diet enhanced HDL cholesterol particle size, which is crucial for its protective function against atherosclerosis. Participants experienced improved HDL functionality due to increased consumption of legumes and dark leafy greens rich in bioactive compounds like polyphenols and carotenoids

Furthermore, Jenkins (2024) showed that A plant-based diet has shown notable effects on triglyceride (TG) levels. Long-term adherence to plant-based diets is often associated with lower triglyceride levels compared to diets high in refined carbohydrates or saturated fats. The benefits likely stem from the increased intake of fiber, whole grains, and phytochemicals, combined with the exclusion of processed and high-fat animal products. However, evidence from interventional trials presents mixed results, with some studies observing modest increases or decreases in triglyceride levels depending on the specific dietary adjustments. These changes are typically within a range of ±25 mg/dL and may be influenced by individual factors such as baseline TG levels, body weight, and overall dietary quality

These results agreed by Yokoyama et al., (2023) , who reported that Plant-based diets are linked to reductions in triglycerides (TGs) due to their emphasis on high-fiber, low-fat, and nutrient-dense foods. A study by in *Nutrition Reviews* analyzed data from 12 clinical trials, concluding that plant-based diets lead to an average decrease of 15% in TG levels over a six-month period. This effect is attributed to reduced consumption of saturated fats and sugars, alongside increased fiber intake, which helps regulate lipid metabolism

In addition, a systematic review by Wang et al. (2024) found that replacing animal-based fats with plant-based unsaturated fats, such as those from avocados, nuts, and seeds, resulted in significant improvements in TG levels. The review highlighted that participant adhering to a vegan or vegetarian diet experienced reductions of up to 20 mg/dL in TG levels, particularly when combined with regular physical activity

Lastly, an observational study from the *European Journal of Clinical Nutrition* (2023) reported that Mediterranean-style plant-based diets incorporating olive oil, legumes, and whole grains had a modest but consistent effect on lowering TG levels. The researchers emphasized that these diets also improve overall cardiovascular risk factors, making them a comprehensive approach to lipid management

Wolever et al., (2024) stated that Plant-based diets, particularly low-fat vegan diets, have been associated with improvements in waist-to-hip ratio (WHR), an important indicator of body fat distribution and cardiovascular risk. Research suggests that individuals following plant-based diets tend to experience more favorable changes in WHR compared to those on other diets. This may be attributed to the diet's emphasis on whole plant foods, which are typically lower in calories and fat while being rich in fiber, antioxidants, and other beneficial nutrients.

A study by Jenkins et al., (2024) concluded that on a low-fat vegan diet exhibited substantial decreases in total cholesterol, LDL cholesterol, and improvements in body fat distribution, including reductions in WHR, among individuals with type 2 diabetes

Plant-based diets are increasingly recognized for their potential to improve body composition and reduce obesity-related metrics, such as waist-to-hip ratio (WHR). Research by **Wolever** et al., (2024) has shown that adopting a plant-based diet can significantly affect fat distribution, particularly abdominal fat, which is often associated with metabolic diseases like type 2 diabetes. One study suggested that the incorporation of more plant-based foods can lead to lower WHR, indicating a more favorable fat distribution across the body This reduction is likely due to the diet's high fiber content and low levels of unhealthy fats, which not only promote weight loss but also improve insulin sensitivity and reduce visceral fat

These findings could be justified by Morales-Suarez-Varela et al., (2021) which concluded that intermittent fasting, with a superior effect to diets with caloric restriction with respect to waist circumference and central fat distribution, and beneficial data in reducing cardiovascular risk in people with obesity or diabetes mellitus. IF is recognized for its significant involvement in regulating the amounts of many proteins involved in lipid metabolism.

These results are in line with Ahmed et al., (2021) demonstrating that various forms of IF, such as Ramadan and alternative day fasting, lower body weight and cholesterol levels. Combining IF with exercise and contrasting various forms of IF also imply that IF may be a useful lifestyle change for lowering the risk of cardiovascular diseases.

A study by Ahmed et al., (2021) Determined that IF lasting 12-36 hours induces a metabolic transition that facilitates the catabolism of triglycerides into fatty acids and glycerol, as well as the conversion of fatty acids into ketone bodies in the liver. During fasting, fatty acids and ketone bodies supply energy to cells and tissues. Research indicates that molecular

modification in the liver induces the expression of PPARα and PGC-1α, resulting in enhanced fatty acid oxidation as well as apoA synthesis, which elevates HDL levels, while apoB diminishes, leading to reduced hepatic triglycerides as well as LDL levels.

Santos and Macedo, (2018) has been determined that various varieties of IF may raise HDL by 1-14 mg/dl, reduce LDL by 1-47 mg/dl, reduce TC by 5-88 mg/dl, as well as reduce TG by 3-64 mg/dl by compiling data from various tests.

A study by Catenacci et al., (2016) Demonstrated that, following an 8-week IF intervention involving 14 obese patients, no adverse reactions were noted regarding the impact of IF, with over 90% of participants successfully completing the process. In an IF intervention trial including obese adolescents, 30 participants were recruited, of which 21 completed the study. The findings indicated that IF effectively reduced BMI and cardiometabolic risk and was deemed an acceptable treatment for this demographic.

A research by Khalfallah et al., (2023) Compared to control diets, IF demonstrated a higher efficacy in weight loss when conducted on a diverse population of overweight subjects with or without obesity. Contrarily, a Cochrane review that included both obese and non-obese individuals found that IF reduced body weight more quickly than an ad libitum diet, but the evidence for this effect was low-certainty. A subgroup analysis that included overweight subjects but not obese ones found that IF had an uncertain short-term effect on weight loss compared to CER.

According to the findings of Naous et al. (2023), IF demonstrates beneficial effects on cardiovascular (CV) risk factors. IF has demonstrated efficacy in promoting weight reduction, enhancing glucose metabolism, improving lipid profiles (decreasing LDL-C and boosting HDL-C), and regulating both systolic and diastolic blood pressure relative to baseline measurements. IF attains these outcomes by diminishing visceral and truncal adiposity via caloric deficits, hence enhancing the leptin/adiponectin ratio as well as regulating hunger. Furthermore, the diminution of obesity and chronic inflammation leads to a reduction in insulin resistance. IF diminishes hepatic synthesis of very low-density lipoprotein cholesterol (VLDL-C) as well as TG while enhancing fatty acid oxidation. IF is correlated with heightened expression of peroxisome proliferator-activated receptor-α (PPAR-α) as well as peroxisome proliferator-activated receptor-γ (PPAR-γ) coactivator 1α in the liver, resulting in enhanced fatty acid oxidation as well as Apo A production, alongside diminished synthesis of Apo B, ultimately facilitating the reduction of LDL-C as well as VLDL-C levels. The impact of IF on blood pressure is facilitated by the activation of the parasympathetic system in the brainstem.

To our knowledge, this is the first study to determine the difference between plant based diet and intermittent fasting diet on lipid profile in obese premenopausal women.

9. CONCLUSION

Plant-based diet is more effective than intermittent fasting diet through decreasing BMI, WHR, total cholesterol, low-density lipoprotein (LDL) & total triglycrides levels and increasing HDL level in obese premenopausal women.

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