Review Article

FAD DIET

Abstract

Fad diets have effective role in promoting weight loss, beneficial effects on body composition; also it may protect against the development of obesity and related chronic diseases such as type two diabetes and coronary heart disease. Fad diets work simply because they restrict calorie intake. Thus, the most important dietary concept of weight loss and maintenance is a decrease in caloric intake; the next concept for successful weight loss is that of energy density which refers to the amount of energy in a given weight of food. This review tries to review and summaries the common types of fad diet.

Key Words: fad, diet, low, carbohydrates, fat

Introduction

Obesity is an important public health problem during the recent years. Obesity has reached epidemic proportions. The prevalence of obesity has increased gradually throughout this century. The prevalence of obesity has reached alarming levels, affecting virtually both developed and developing countries across all socio–economic groups irrespective of age, sex or ethnicity(1). Childhood obesity has been estimated that worldwide, over 22 million children under the age of 5 are severely overweight. One in each ten children are overweight (1-2). This global average reflects a wide range of prevalence level. The prevalence of overweight in Africa and Asia averages well below 10% and in the Americas and Europe, above 20 %(3, 4). The proportion of school-age children affected will almost double by 2025 compared with the most recently available surveys from the late 1990s up to 2003 (5-7). Obesity is an independent risk factor for overall mortality (2). Obesity is associated with heart diseases, sleep apnea, diabetes mellitus, arthritis and cancer (8). In 2014, the World health Organization acknowledged that obesity was a "global epidemic" (4). Diets is one of the factors contributing to obesity as excessive calorie intake leads to weight gain (9).

Table 1. Prevalence and projection of overweight \obesity in children and adolescents in various regions of the world

Region	Overweight *	Obesity**	Overweight*	Obesity**
Africa (1987-2003)	1.6	0.2		
Americas(1988-2002)	27.7	9.6	46.4	15.2
Eastern Med (1992-2001)	23.5	5.9	41.7	11.5
Europe (1992-2003)	25.5	5.4	38.2	10
South East Asia (1997-2002)	10.6	1.5	22.9	5.3
West pacific (1993-2000)	12	2.3	27.2	7

*Body mass index more than 25kg/m^2 - **Body mass index more than 25kg/m^2

Increased availability of fast foods and televised entertainment could contribute to obesity by making eating more attractive and physical activity less. Previous research on the relationship between television viewing and body weight has shown positive associations in studies involving children and adults (6).

Table 2 Cut –off points by a WHO expert committee for the classification of overweight

BMI(kg\m^2)	WHO classification	Popular description
<18.5	Underweight	Thin
18.5-24.9	-	Healthy "normal", "acceptable"
25.0-29.9	Grade 1 overweight	Overweight
30.0- 39.9	Grade 2 overweight	Obesity
≥40.0	Grade 3 overweight	Morbid obesity

BMI is the weight in kilograms by the square of the height in meters.

Methodology

Google search engine was used to gather information relating to obesity and the associated diets. The study was written in English. The study period has occurred from January to end of June 2018. Keywords included "fad diet", "low carbohydrates", and "fat". The search generated about 165 sources, of which 74 sources were used. These 74 articles were considered relevant because they answered the objectives of the review. The library databases such as PubMed and MEDLINE were also used during the study.

Factors influencing obesity

Obesity is not a single disorder but a heterogeneous group of conditions with multiple causes (8). Body weight is the result of the interaction between genetic, environmental and psychosocial factors, acting through the physiological mediators of energy intake and expenditure (10).

Fatness run in families but the influence of the genotype on the etiology of obesity may be attenuated or exacerbated by non-genetic factors (11). The genetic influences seem to operate through susceptible genes for obesity which are inherited and impact adversely on body fat composition, anatomical distribution of fat, food intake and energy expenditure

It has been shown that environmental factors drive the susceptible gene in to action (11, 12). Research hypothesized that environmental factors play a key role in unmasking latent tendencies to develop obesity (12). The biggest component of energy expenditure is physical activity which represents 20-50% of total energy expenditure (5-7).

It is surprising that no direct correlation has been reported between the prevalence of obesity and increased energy intake in developed nations, given the ready availability of highly palatable foods (13). The evidence for the critical role of environmental factors in the development of obesity comes from migrant studies and the ' westernization' of diet and lifestyles of other cultures previously from developing countries (13). For example, there are reports that those migrants that move to live in the United States is on average 25 kg heavier than Pima Indians living in Mexico(7). Similarly, in Nigeria the mean BMI for men and women has been reported as 21.7 and 22.6 respectively, relative to 27.1 and 30.8 in the United States (7) For instance, the prevalence of hypertension in adult Nigerians living in Africa is 15%, relative to as high as 30% among those living in United States. A higher prevalence of overweight and obesity is observed in those with lower educational attainments and low income (7, 14-16). There is evidence that indicate that over-nutrition of fetus during intrauterine development may determine the later onset of obesity, hypertension and type 2 diabetes independent of genetic inheritance. (15)

Fad diet

A fad diet is a weight loss eating plan that promises dramatic results over short term period (8). In fact, to some extent the word "fad" is not a scientific term (17). Conversely, the widely used term "healthy" is also not scientific (17). However, an attribute of a fad diet, is that those who consume it do not like it (18). It is generally considered that a fad diet is the other person's diet (9,17). In practical terms there are two kinds of fad diets; firstly, those that have some quirky feature which hardly anybody adheres to (unlike fads in fashion), and secondly, the bête noire of the nutritional establishment. The operational definition of fad therapies includes the following; "therapies used for a limited period of time", "therapies used without proven efficacy", "therapies used by a limited under of patients", and "therapies that are not mainstream" (10).

People have always been obsessed with dieting. They willingly try the latest fad diets that defy logic, basic biochemistry, and even appetite appeal. Fad diets are popular because they promise quick results, are relatively easy to implement, and claim remarkable improvements in how their followers will look or feel. Unfortunately, there are some types of attributes fad diets have in common, and that is, they seldom promote sound weight loss(9). The common features of fad diets can be summarized according to (19) as follows. "They promise rapid weight loss"; "there is restriction of one food item or food group"; "they promote intake of a particular food item or food group" and that "they claim to cure numerous health problems". Other attributes include these; "they have simplistic theories that are presented in a scientifically sound manner" though "they are not supported by scientific evidence"

Types of fad diet

According to (20), there are many types of fad diets but the most popular fad diet are low carbohydrate diets, high fat diets and very low carbohydrate diets. Some diets are a combination of high carbohydrates, low fat or moderate fat. There are diets that are also low in glycemic index, vegetarian diet, high protein diet, cappage soup diet and grape fruit diet. In this review, only three types of fad diet were discussed; low carbohydrates diet, low glycemic index diet and low fat diet.

Low carbohydrate diet

Low carbohydrate diets have primarily been used in the treatment of diabetes prior to the discovery of insulin (10). Low carbohydrate/high fat diets have also been used in the early 1900s as a pediatric anti-epileptic therapy (11) After many decades of development in variety of food products and bad eating pattern, obesity become problematic and the percentage of people who are overweight and obese have increased tremendously. Obesity becomes a worldwide epidemic Low –carbohydrate diet has effective role in weight loss and in reduction of cardiovascular risk factors (13). The low- carbohydrate, high –protein diet that bears his name "Atkins diet" (14) (15). This diet that are low in carbohydrate, high in protein diets are one of the most popular alternative weight loss approaches. These diets derive a large proportion of energy intake from protein and fat (16). Low carbohydrate diet less than 130 gram/day or less than 26% of a nominal 2000 Kcal/day diet is the American Diabetes Association definition which seems appropriate (17). Carbohydrate restriction is not well defined. Anything less than 50% of the diet is considered by some to be a low carbohydrate diet from this perspective (17). The definition of low-carbohydrate diets is even more widespread, because it depends on the definition given by the author(s) of the diet. Some of the diets known to be low in carbohydrate are the Atkins diet, protein powder, the south Beach Diet, and the Zone diet. (18) However, Low carbohydrate diets appear to have some adverse effects. A low carbohydrate diet has common short-term side-

effects such as constipation, fatigue, halitosis, headache, thirst, polyuria and nausea (19) muscle cramps Headache, diarrhea general weakness and rash, chest pain, and hyperosmolar coma (12).

Long term disadvantages of low carbohydrate diet include increased fat intake and consequently cholesterol level**; a**ccelerate progression of pre-existing kidney disease, increased urinary calcium excretion (16).

Mode of action of low carbohydrate diet

Low carbohydrate diet shows success at six months to one year. Low carbohydrate diet decreases insulin resistance and improvement in lipid profiles when obese individuals are placed on a low carbohydrate diet. (21, 22). Ketosis occurs during the first few days of fasting or a low carbohydrate diet, when breakdown of fat (oxidation) outstrips breakdown of carbohydrate (glycolysis) (23) . so low carbohydrate diets work primarily by decreasing food choice in diets where fat and carbohydrate are so tightly associated (24). Also there is a suggestion that there is increased satiety with low carbohydrate diets (25). The systolic pressure did not change significantly but diastolic pressure decrease after following the low carbohydrate diet for six months (25, 26) Low carbohydrates diet relatively increase in HDL cholesterol concentration and the relatively decrease triglyceride concentration (27). Carbohydrate restriction leads to a marked reduction in triglycerides (TAG)- this is one of the most reliable features of any dietary intervention – and improvement in HDL. Changes in total cholesterol and LDL tend to be variable on low carbohydrate diet (28). Low carbohydrate diets are nutritionally inadequate. They are low in vitamins E, A, thiamin, B6, folate, calcium, magnesium, iron, potassium, and dietary fiber, calcium and require supplementation; because food high in carbohydrates usually rich in these nutrients . These diet are high in saturated fat and cholesterol (29).

Randomized trial of low carbohydrate diet in literature

The study was approved by the institutional review board at the Philadelphia Veterans Affairs Medical During an enrollment period that lasted from May to November 2001, involving one hundred and thirty–two (132) subjects from the Philadelphia Veterans Affairs Medical center. In this study they had randomly assigned 132 severely obese subjects (including 77 blacks 23 women) with a mean body-mass index of 43kg/m^2 and high prevalence of diabetes (39 percent)and after exposed to either low carbohydrate. All subjects, who are exposed to the low-carbohydrate diet lost more weight than those on the low –fat and had greater decreases in triglyceride the amount of weight lost and assignment to the low-carbohydrate diet were independent predictors of improvement in triglyceride levels and insulin sensitivity (30).

The low carbohydrate diet craze has a long history in America. It may be particularly appealing in the face of the current rise in obesity. While it may provide weight loss in the short-term, a low carbohydrate, high protein diet is not recommended as a way to keep a population healthy in the long term (31). In 2001 in Philadelphia they conducted a one-year, multicenter, controlled trial involving 63 obese men and women who were randomly assigned to either a low carbohydrate , high-protein , high fat diet. All subjects on the low-carbohydrate diet had lost more weight than subjects on the conventional diet at 3 months (3.7 percent of body weight) and 6 months (5.6 percent of body weight) , but the difference at 12 months was not significant . after three months, no significant difference were found between the groups in total or low-density lipoprotein cholesterol concentrations (32).

Low glycaemic index:

The glycaemic index was proposed in 1981 as alternative system for classifying carbohydrate-containing food. Since them , several hundred scientific articles and books have been published

on the topic (36). One of the main dietary factors that thought to influence body weight is the glycaemic index(GI) . the glucemic index was initially conceived by Jenkins as a tool for the dietary management of type 1 diabetes and , later dyslipidemia (37). Several study have described a link between satiety and body metabolism , ana a number of these studies have focused on the role of glycaemic index and glycaemic load (GI\GL) in weight loss. Evidence suggests that low GI and low glycaemic load GL diets may be protective against the development of chronic and obesity related disease (e.g, type 2 diabetes and coronary heart disease (CHD) (38). The GI of a food will vary depending on the rate of digestion. The faster the digestion of a food , the higher is the GI value (>70) . food with a low GI (≤70) are considered to be favorable in terms of health, particularly for the prevention of obesity, T2DM, and CVD (39).

-Low glycaemic definitions:

1- the glycaemic index (GI) is a physiological assessment of a foods carbohydrate content through its effect on postprandial blood glucose concentrations.

2- the GI has been defined as the testing of a person in the morning , after an overnight fast (37). It is a property of carbohydrate –containing food that describes the rise of blood glucose occurring after a meal . there are foods that are rapidly digested and absorbed or transformed metabolically in to glucose , and thus have a high GI index (40).

3- glycaemic index is also defined as the incremental area under the glucose response curve after a standard amount of carbohydrate from a test food relative to that a control food (either white bread or glucose) is consumed.

The glycaemic index of specific food , or meal is determined primary by the nature of the carbohydrate consumed and by other dietary factors that effect nutrient digestibility or insulin secretion. Glycaemic index values for common foods differ by more than 5 fold and glycaemic response to mixed meals can be predicted with reasonable accuracy from the glycaemic index of constituent foods when standard methods are use (36).

4- the term of glycaemic load defined as the weighted average glycaemic index of individuals food multiplied by the percentage of dietary energy as carbohydrate has been proposed to characterize the impact of food or dietary patterns with different macronutrient composition on glycaemic response (36).

Mode of action:

The GI of a food is impacted by the nature of the starch, particle size , ph , the amount of fiber, fat, and protein, in addition to cooking method and time in general , low GI diets are thought to be metabolically advantageous because of their potential in improving glycaemic control. The GI is determined by comparing the postprandial glycaemic response of a food with response to the postprandial glycaemic food (white bread or glucose) in the same individual to the same amount of available carbohydrate from a standard (38). On the other hand , glycaemic load (GL) includes both the GI and total carbohydrate intake;thus , approximates the total glycaemic effect of the diet, which gives an adequate assessment of the total diet(41). The GI value of a food is tested on the food when eaten on its own, and there are published lists of high, medium and low GI foods (40).

Table 3 meal composition based on sample test meals

Foods	Low GI	Medium GI	High GI
	55g whole egg	639g steel cut oats	609g instant oatmeal
	45 egg white	160g 2% milk	160g 2% milk
	40g low fat cheese	15g half &half cream	15%g half&
	200g spinach	160g fructose	19.0g dextrose
	30g tomato	0.0g saccharine	0.2g saccharine

	185g grapefruit 115g apple slices	397g water	397g water
Energy from carbohydrate	40	64	64
Energy from protein	30	16	16
Energy from fat	30	20	20
Energy density (Kj\g)	2.26	2.52	2.52

Table represent precooked weight "weight of oats used were adjusted to reflect differences in hydration as described in 'methods' . treated with lactase to increase the GI of milk sugar (40).

Metabolic effects of low glycaemic –index diets

Low GI diets and metabolic syndrome:

gI has been shown to be positively associated with the prevalence of the metabolic syndrome and insulin resistance. Weight loss is an additional potential mechanism by which low-GI diets may contribute to reduced risk of metabolic syndrome which may be the result of a great limitation of food choices by the requirements of minimizing carbohydrate intake to the initial increase in circulating b-bhydroxybutyrate (BHB) which may suppress appetite and to the satiating effect of low- carbohydrate diets containing relatively high amount of protein . low GI diets give a more stable diurnal profile, reducing postprandial rebounds in circulating free fatty acids, all factors that exacerbate various components of the metabolic syndrome (39) however , in the context of blood glucose, the hypothesized metabolic effects relate to the rate at which glucose is absorbed from the small intestine. A reduced rate of glucose absorption after the consumption of low glycaemic index carbohydrate foods will reduce the postprandial rise in gut hormones (e.g. in cretine) and insulin (42). By reducing insulinemia , low GI foods may provide greater access to fatty acids as a source of fuel, promoting greater fat oxidation (43) the prolonged absorption of carbohydrate seen over time will maintain suppression of the free fatty acids (FFA) and the counter regulatory responses , with the reduction in FFA concentrations and the rise in the respiratory quotient with tissue insulinization, glucose is withdrawn from the circulation at a faster rate. In addition , LDL-cholesterol concentrations were reduced with the low-glycemic –index diet (42) and the reduction in free fatty acid levels improves cellular glucose metabolism, with glucose withdrawn from the circulation at a greater rate . this improved blood glucose control is of importance to individuals with insulin resistance (e.g. in obese, sedentary subjects), prediabetes , and diabetes.

-Trails:

1- in a study conducted in university of Minnesota , 20 subjects were randomly assigned to 1 of 3 hypocaloric test diets: high glycaemic index , low glycaemic index or high fat with varying macronutrient composition, glycaemic index , and glycaemic load. The study was conducted in 2 continuous phases , a 12-wk feeding phase, followed immediately by a 24 wk"free-living" phase. Each diet group lost body weight during the 12wk feeding phase of the study , but the amount lost did not differ among the groups. The improvement in the LGI group was significantly greater than the improvement in the HF group at wk 12, this dietary trial demonstrate that energy restriction over a 36-wk period promotes weight loss and improves insulin sensitivity in obese individuals , irrespective of dietary substrate. The hypothesis that a low glycaemic load diet would enhance weight loss, relative to other diets, was not supported in either study phase (44).

2- Twenty-one obese or overweight volunteers (5men 16 women), aged between 25 and 65 years, subjects with hypercholesterolemia were recruited. Study design this is a randomized crossover single- blinded study examining the effects of low GI or GI breakfast on satiety, lipid and glucose metabolism. A total of 21 subjects were recruited to ensure adequate numbers in the event of subjects choosing to withdraw from the trial, and showed that total daily energy intake (calculated from 3-day dietary records) were not significantly different between the low and high dietary interventions after 21 days. Although low GI intervention resulted in lower absolute intake (g) of all macronutrient measured compared with high GI intervention, the differences between interventions did not reach statistical significance (45).

3- in this study a total of 23 (25 women and 7 men) of 34 enrolled participants completed the 6-month intervention period and necessary measurements . participants were randomized for 24 weeks to either a high –glycemic load diet or a low glycaemic load diet at 30 % calorie restriction compared with baseline individual energy needs , the main finding from this pilot study was that healthy overweight women and men with relatively greater insulin secretion in response to a standard oral glucose tolerance test lost more weight when assigned to a low –glycemic load hypo caloric diet than to a high glycaemic load diet, but there was no differential effect of the two diets on weight loss in individuals who had relatively lower insulin secretion (46).

4- six patients with NIDDM were studied on both high-and low GI diets of 6wk duration with metabolic diets with randomized crossover design . both diets of similar composition (57% carbohydrate, 23%fat, and 34% g\day dietary fiber), but the low GI diet had a GI of 58 compared with 86 for the high GI diet , and fining that small and similar amounts of weight were lost on both diets:2.5Kg on high –GI diet and 1.8Kg on low GI diet . on the low GI diet, the mean level of serum fructosamine, as an index of overall blood glucose control , was lower than on the high –GI diet by 8% by 7% , and total serum cholesterol was lower. In overweight patients with NIDDM, reducing diet GI improves overall blood glucose and lipid control (47).

Low fat diet:

-definitions:

A low fat diet is defined as limiting food sources of fat. Dietary guidelines recommend a reduction in total fat content to less than 30% of the energy intake to help reduce to the prevalence of obesity, ischemic heart disease and certain cancer (50).

In 2001 the American heart association publish its therapeutic lifestyle changes (TLC) diets, in this diets it is recommended that fat account for no more than 30% of persons daily intake of calories and saturated fat make up no more than 10% of total calories (51). the low fat, restricted calorie diet on American Heart Association 20 guidelines. Aimed at an energy intake of 1500 Kcal per day for women and 1800 Kcal per day for men , with 30% of calories from fat , 10% of calories from saturated fat , and an intake of 300 mg of cholesterol per day. (52) the American Heart Association recommended keeping total fat intake to less than 35 percent of total calories (20 grams per day based on a 2,000- calorie diet) and limiting trans fat consumption to less than 1 percent (or about 2grams based on a 2,000-calorie diet) and saturated fat consumption to less than 7 percent of total daily calories (53). For the purposes of this statement , a very low fat diet id defined as one in which 15% of total calories are derived from fat (33g for a 2000-calorie diet , 50 g for a 3000-calorie diet) with fat calories distributed approximately equally among saturated , monounsaturated , and polyunsaturated fatty acids. Approximately 15% of total daily calories consumed should be derived from protein and more than or equal 70% from carbohydrates. On the same way current dietary guidelines from both the American Heart Association and the National Cholesterol Education Program2 recommend restricting consumption of fat to an upper limit of 30% of daily caloric intake. This limit translates in to 67 g of fat for small or sedentary individuals who need 2000 calories per day and 100 g of fat for larger or more active individuals who need 3000 calories per day . with the exception of the

World Health Organization Study Group3, which recommends that 15% of total calories be derived from fat , current guidelines do not specify a lower limit on fat intake (54-55-56).

Mode of action

Genetic and environmental factors play a role in the development of obesity, and diet is one of the main environmental factors that contributes to this disease . human studies have shown that increased fat intake is associated with body weight gain which can lead to obesity and other related metabolic diseases (57-58). In animals , increasing dietary fat increases body fat , and it is unlikely that humans escape this important biological rule. In epidemiological studies, increasing dietary fat is associated with increased prevalence of obesity probably by increasing the intake of energy dense foods . in the National Weight loss Registry (in united states) , there things were associated with weight loss :continued monitoring of food intake , lowering dietary fat intake ,and increased exercise. The relation of dietary fat is most evident when physical activity is low . the speed of adaption to dietary fat is increased by exercise . when dietary fat is reduced , weight is lost, but weight loss eventually plateaus. The rate of weight loss during the initial phase is about 1.6g\day for each 1% decrease in fat intake. When dietary fat is replaced with olestra to reduce fat intake from 33% to 25% in obese men, weight loss continues for about 9 months reaching a maximum of nearly 6% of body weight and a loss of 18% of initial body fat. In the control group with a 25% reduced fat – diet, weight loss stopped after 3 months and was regained over the next 6 months , indicating the difficulty of a adhering to a conventional low-fat diet. Thus, dietary fat is an important contributor to obesity in some people (59). Several intervention trials have examined the effect of a low fat diet with or without energy restriction in overweight subjects (60-62).and these have been reviewed (63-64-65). And a meta –analysis performed by Astrup et al (66-67). The rate of weight loss generally greater when the low fat diet was combined with reduction in total energy intake . These studies show that apart from energy restriction . a low fat diet alone is effective in inducing weight loss in overweight subjects, with an observed mean weight loss about 1.8Kg\month. Although the rate of weight loss on an ad libitum , low fat ,high –carbohydrate diet may not be as rapid as that induced by energy restriction (calorie counting) , the diet has been found to provide greater satiety and , subsequently , the compensation for the decrease in energy intake is not complete , i.e. . energy intake remains decreased (68-69-70-71). Accepting the favorable effect of lowering blood lipid concentration , the studies on the quantitative and qualitative effects of dietary fatty acids on serum lipids in man are of interest (72). However , considerable confusion still exists whether a reduction of saturates fatty acid or an increase of polyunsaturated fatty acid concentration in the diet is the more effective approach in lowering human blood lopid concentrations, when the blood lipid increasing effects of the various saturated fatty acids were examined , it was found that lauric and myristic acids each have a stronger effect than palmitic acid; stearic acid and fatty acids with shorter chain lengths than lauric acid probably act similarly to oleic acid furthermore , recently observed that elaidic acid in the presence of cholesterol has a definite serum cholesterol increasing effect compared is only slightly less active than a mixture of lauric acid and myristic acid consumed in equal amounts (73).

Trials (low fat diet in literature) :

The very low carbohydrate , high protein diet , promote extensively by Atkins and other , is one of the most popular of the alternative weight loss approaches as ported . the central rationale of this diet is that severe restriction of dietary carbohydrate (>10% of daily caloric intake) with its resulting ketosis , promotes lipid oxidation , satiety , and increased energy expenditure , factors that should promote negative energy balance and weight loss as reported . however, these purported responses to very low carbohydrate feeding have not been established . furthermore , as studies that severely restrict carbohydrate intake all been of short duration (i.e. 6 wk) as

mentioned , the clinical benefits of ketogenic diets are unproven . because low carbohydrate diets derive large proportions of calories from protein and fat , there has been considerable concern for their potentially detrimental impact on cardiovascular risk as reported . increased consumption of fat , particularly saturated fat , has been linked to increased plasma concentrations of lipids as (Law M2000 dietary fat and adult diseases) reported , insulin resistance , glucose intolerance as reported , and obesity as reported . therefore , it is possible that many Americans could actually suffer adverse health effects by using very low carbohydrate diets in an attempt to lose weight . A study concluded that a very low carbohydrate diet , taken without a specified restriction of caloric intake , is effective for weight loss over a 6 month period in healthy , obese women . compared with the low fat group , who followed a diet conforming to currently recommended distributions of macronutrient calories , the very low carbohydrate group lost significantly more weight , a finding that was apparent both when the women completing the diet were considered alone and when the data were analyzed using intent to treat principles . in addition , despite eating a high percentage of calories as fat and having relatively high intakes of saturated fat and cholesterol , the women in the very low carbohydrate group maintained normal levels of blood pressure , plasma lipids , glucose , and insulin . these data suggest that the deleterious effects of diets containing a high percentage of fat on body weight and cardiac risk factors are mitigated by restriction of caloric intake and associated weight loss (74). In study was done by dietary intervention Randomized controlled Trial group show that 2 year trial at which 322 moderately obese subjects with mean age 52 years , mean body index 31 , about 86% males in sex and under three types of diets low fat , restricted –calorie Mediterranean restricted calorie or low carbohydrate , non restricted calorie . at this study the Mediterranean diet group consumed their diet in form of dietary fiber and had the highest ration of monounsaturated to saturated fat . In contrast the low carbohydrate group consumed the fat , protein and cholesterol as largest amount of diet and carbohydrate as smallest amount of cholesterol as largest amount of diet. The effect of this study on weight loss could be shown as the mean weight loss was 2.9 KG for the low fat group , 4.4 KG for the low Mediterranean –diet group and 4.7 for low carbohydrate group . Mediterranean e and low carbohydrate diets may be effective alternatives to low fat diet . the more favorable effects on lipid (with low carbohydrate diet) and on glycaemic control (with the Mediterranean diet) suggest the personal preferences and metabolic consideration might in form individualized tailoring of dietary intervention was done and other show that severely obese patient who complaining of diabetes or the metabolic syndrome lost more weight during six months period on which the diet was restricted in carbohydrate than on calorie and fat restricted diet , the study was done by randomly assigned 132 severely obese patient in which 77 blacks and 23 women were the component of group , the body weight index was 43 and high prevalence of diabetes 39% or the metabolic syndrome 43% this group was under carbohydrate restricted diet or fat restricted diet the result shoe that 79 patients complete the six months period of study all the subjects were analyzed . the analysis show that subjects on low carbohydrate diet lost more weight than those on the low fat diet (75). Another study was done to report data on body weight in a long-term , low fat diet trial for which the primary end points were breast and colorectal cancer and to examine the relationships between weight changes and changes in dietary components . 20,21 Briefly, 48women , nearly 20% of whom were ethic minorities , between the ages of 50 and 79 years were randomly assigned to the intervention (40%) or control group (60%) Eligibility criteria included being 50 to 79 years of age , postmenopausal , and consuming a diet at baseline with fat intake of at least 32% of daily total calorie as evaluated by a food frequency questionnaire (FFQ) all women provided informed consent before randomization in to the trial , and the study was approved by the institutional review women assigned to the control group received a copy of the dietary Guidelines for Americans 23,24 as well as other diet and healthy related educational materials , but otherwise had no contact with study dietitians . in

contrast , women randomized to dietary intervention were assigned to group of 8 to 15 participants for a series of sessions structured to promote dietary and behavioral changes that would result in reducing total dietary fat to 20% and increasing intakes of vegetables and fruit to 5 or more servings and grains (whole grains encouraged) to 6 or more servings daily the results are women in the intervention group lost weight in the first year (mean of 2.2 Kg) and maintained lower weight than control women during an average 7.5 years of follow up (difference , 1.9Kg at 1 year and 0.4Kg at 7.5 years) . No tendency toward weight gain was observed in intervention group women overall or when stratified by age , ethnicity , or body mass index . weight loss was greatest among women in either group who decreased their percentages of energy from fat . a similar but lesser trend was observed with increases in vegetable and fruit servings , and a non significant trend toward weight loss occurred with increasing intake of fiber. It is concluded that a low fat eating pattern dose not result in weight gain in postmenopausal women (76). Another study was done to show the effects of ad libitum low fat , high carbohydrate diets on body weight and serum lipids in overweight subjects with metabolic syndrome one hundred twenty potential subjects were invited to attend a screening session in which body weight , height, waist circumference , blood pressure , and blood biochemistry indexes were measured to determine eligibility for the present trial . subjects currently dieting were excluded , as were those planning to being a weight control program within the next 8 mo . fifty subjects were recruited on the basis of having 3 risk factors for metabolic syndrome . these risk factors included age <38 y , overweight (body mass index (BMI;in Kg\m2) of 27-40) , central obesity as assessed by the waist to hip ratio (women >0.8; men >0.9) a family history of type 2 diabetes , fasting plasma glucose of 5.5 -6.9 mmol\L , HDL cholesterol <1.0 mmol\L , triacylglycerol>2.0 mmol\L , and diastolic blood pressure of 85-100mm HG, in which 398 overweight individuals recruited simply on the basis of body weight participate in a identical 6mo intervention . four subjects were excluded for noncompliance during a 1 mo run in period ; the remaining 46 subjects were randomly assigned to either the control diet (n=15) ; the low fat high complex carbohydrate (LF-CC) diet (n=16); or the low fat high simple carbohydrate (LF-SC) diet (n=15) group. The study was designed to provide the participant with 60% of their total energy intake from the study grocery store; the remainder of energy intake was provided by the subjects home diet . The goals of the study were to maintain fat intake in the control group at habitual amounts (35-40% of energy) , and reduce fat intake by 10% of total energy in both low fat groups, and to alter the ration of simple to complex carbohydrate to 1:2 in the LF-CC group, and to alter the ration of simple to complex carbohydrate to 2:1 in the LF-SC group the result shown as weight loss was greatest with the LF-CC diet (change in body weight : control diet, 1.03Kg;LF-CC diet, 4.25 Kg LF-SC diet, 0.28Kg) Total cholesterol decreased by 0.33m Mol\L, 0.63m Mol\L, and 0.06m Mol\L in subjects consuming the control , LF-CC, and LF-SC diets , respectively (difference between the LF-SC and LF-SC groups. There were no significant changes in LDL cholesterol , whereas HDL cholesterol decreased over time in all 3 groups. Triacylglycerol concentrations were higher in the LF-SC group than in the other 2 groups (77). Another study was done to show the role of low fat diets in body weight control , the objective of this study is that low fat high carbohydrate diets are recommended to prevent weight gain in normal weight subjects and reduce body weight in overweight and obese . however this study evaluate the efficacy of libtium low fat diets in reducing body weight in non diabetic individuals from the result of intervention trials .These studies included a total of 1910 individuals , 62% women and 38% men . the criteria were : controlled trials lasting more than 2 months comparing ad libitum low fat diets as the sole intervention with 19 intervention groups , fourteen were randomized a control group consuming habitual diet or a medium fat diet and libitum . the results were . weight loss was not the primary aim in 11 studies the mean proportions of dietary energy from fat in the studies were 37.7% (95%cl, 36.9-38.5) in the low fat groups , and 37.4% (36.4.38.4) in the control groups but after

the intervention , the low fat intervention produced a mean fat reduction if a 10.2% (8.1-12.3) low fat intervention groups showed a greater weight loss than control groups)32 kg , 95% confidence interval 1.9-4.5Kg , and a greater reduction in energy intake (1138Kj\day , 95% confidence interval 564-1712 Kj\day . having a body weight 10Kg higher than the average pre-treatment body weight was associated with a greater difference in weight loss. So it is concluded that reduction of fat diet without intentional restriction of energy intake causes weight loss , which is more substantial in heavier subjects (78). As we have said a low fat diet is defined as limiting food sources of fat . dietary guidelines recommended a reduction in total fat content to less than 30% of the energy intake to help reduce to the prevalence of obesity , ischemic heart disease and certain cancer (50). But on the other hand Willett has stated that ' diets high in fat do not appear to be the primary cause of the prevalence of excess body fat in our society and reductions in dietary fat will not be the solution and in the longer term fat consumption within the range of 18-40% appears to have little if any effect on body fatness (79).

Conclusion:

Fad diets promote quick weight loss which are easy to be implemented and do not take longer time to give the result. Low carbohydrate diet has shown success in weight reduction and treatment for disease such as diabetes and cardiovascular disease while it may provide weight loss in the short term. Regarding low fat diet, there is direct correlation between the fat and disease , which make the people can avoid disease by decrease the amount of fat in the food and decrease the total daily energy consumption reduction of saturated fatty acid or an increase of polyunsaturated fatty acid concentration in the diet is the more effective approach in lowering human blood lipid concentrations.

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