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DIETARY INTERVENTIONS FOR WEIGHT LOSS

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ABSTRACT

Obesity is a complex and chronic condition that requires continuing care. A variety of diet plans are available for use in the clinical setting. Exactly what type of diet is the most beneficial remains up for debate. Numerous clinical trials have been carried out over the years to compare an array of dietary interventions for weight loss, including calorie-restricted diets, altered macronutrient composition diets, or specific dietary patterns. This paper will provide an overview of some of the evidence-based dietary interventions for clinical practice.

Keywords: Obesity, weight loss, dietary interventions, low-carbohydrate diet, energy restriction

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INTRODUCTION

Obesity is a serious global epidemic associated with numerous metabolic complications, including type 2 diabetes (T2DM), hypertension, cardiovascular disorders, and several cancers. The aetiology of obesity is multifactorial, involving an interplay of genetic, biological, environmental, social, cultural, and behavioural factors. Even though a successful weight loss strategy should be individualised and address all the underlying causes of obesity, dietary and lifestyle interventions remain the cornerstone of treatment. However, the optimal dietary approach to weight loss is still a subject of debate amongst experts, healthcare professionals, and the public, as studies have failed to demonstrate the superiority of one diet plan over another in the long term. Comprehensive assessment of an individual's dietary habits and lifestyle should be the first step in deciding on the best dietary intervention for weight loss and avoiding a one-size-fits-all approach. There is evidence that even modest weight loss of 5-8 percent body weight achieved with diet and lifestyle interventions improves glycaemia, blood pressure, lipid profile, mobility, and quality of life.[1-2] Greater weight loss might be needed to produce health benefits in individuals with morbid obesity or multiple comorbidities.

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ENERGY RESTRICTION DIET INTERVENTIONS

Energy-restricted diets range from continuous or intermittent diet plans with moderate to severe caloric deficit depending on the health status and weight loss goals of a patient or client. A calorie deficit of at least 500-750 per day is recommended to achieve a weight loss of 0.5-1.0 kg per week, which is the standard approach in clinical practice. These continuous energy restriction diet plans are formulated using healthy eating and exercise principles incorporating individual food preferences and behaviour modification to increase compliance. However, specially formulated meals or partial liquid meal replacements have also been employed to help achieve the necessary caloric deficit to drive weight loss in certain individuals after considering their health status, dietary preferences, and cost.

On the other hand, Low and Very Low Energy Diets (VLED) based on total meal replacements restrict energy intake to about 800 calories per day or less, which results in a more rapid weight loss and improvement of obesity related comorbidities including remission of type 2 diabetes.[3-5] The use of total meal replacements helps to deliver adequate levels of essential nutrients and improves adherence. VLEDs have been underutilised in clinical practice in view of concerns over the potential loss of lean body mass, risk of precipitating eating disorder, overall safety, and subsequent weight regain due to rapid weight loss. However, when clinically supervised, there is no evidence of VLED causing eating disorders or resulting in worse outcomes on knee strength, handgrip strength, or bone density compared to moderate energy-restricted diets in short-term studies lasting 3-6 months.[6-8]

The use of VLEDs in supervised conditions for up to three months in patients who fail to meet weight or metabolic targets with a standard approach is gaining support from institutions such as the National Institute for Health and Clinical Excellence and clinicians. A structured, individualised weight maintenance programme with gradual readjustment to normal eating after VLED is necessary to maintain weight loss and metabolic benefits.[5,9,10] Further research is needed to assess the long-term impact of VLED plans on body composition, weight maintenance, and metabolic outcomes.

Intermittent energy restriction (IER) is another dietary approach for weight loss that involves periods of fasting and eating or Intermittent Fasting (IF) with or without calorie restriction. Popular types of IF include alternate-day fasting (ADF), the 5:2 fast (five days of normal eating and two days of restricted eating per week), and time-restricted eating (TRE).[11] In the TRE trials, the fasting window varies from 12 to 20 hours with an *ad libitum* diet during the eating period.

The key appeal of IF is high compliance, easy sustainability compared to continuous daily caloric restriction, and other potential health benefits such as improvements in cognitive function, metabolic health, and longevity demonstrated by animal studies.[12] However, feelings of hunger may be more pronounced during IER.

The evidence from human trials suggests that IF is safe for most healthy adults and achieves comparable weight loss and metabolic improvements to continuous energy restriction.[13,14] In recent meta-analyses, both intermittent and continuous energy restriction resulted in a similar weight loss, weight maintenance, and improvements in cardiovascular risk factors.[15,16] However, IF may be more effective as a weight loss intervention for people with a higher BMI.[17] Many studies on IF in humans are short-term and involve a small number of subjects. Furthermore, with the focus of IER on the timing of eating rather than on food choices, some individuals might not achieve a desirable diet quality. It is therefore important to counsel patients about making healthy food choices when they are not fasting to improve their health further or prevent potential nutrient deficiencies. Longer-term trials are needed to further address the safety and efficacy of IF for different patient groups to help build confidence in recommending these IER plans.

ALTERED MACRONUTRIENT COMPOSITION DIETS

Low and very low carbohydrate diets, often referred to as "keto" diets, have gained popularity amongst healthcare professionals and the public as an effective tool for weight loss and a means to reduce metabolic complications associated with overweight and obesity. However, the terms "low carbohydrate diet", "very low carbohydrate diet", and "ketogenic diet" are often used interchangeably with lack of consensus in the literature on their definition. Low carbohydrate diets are defined as providing less than 26 percent of calories from carbohydrates (50-130 g per day) while very low carbohydrate diets limit carbohydrate calories to less than 10 percent (20-50 g per day).[18]

The ketogenic diet was initially developed to treat severe epilepsy in infants and children under medical supervision. It is a very low carbohydrate high-fat diet plan, resulting in a state of ketosis where fat instead of glucose is being burnt for fuel. True ketogenic diets used in clinical settings can limit carbohydrates to as little as 5 percent of calories, primarily from non-starchy vegetables, and provide up to 85 percent calories from fat with enough protein to preserve lean body mass but maintain ketosis.

However, when used as a tool for weight loss, these "keto" diet plans vary in the proportion of fat, protein, and carbohydrates they provide. The standard ketogenic diet usually provides 60-70 percent calories from fat, 20-30 percent from protein and up to 10 percent from carbohydrates. However, there is an individual variation in the level of carbohydrate and protein intake that is compatible with ketosis, thus diet personalisation is required. "Keto flu" is a frequent side effect of a keto diet, which can include light-headedness, fatigue, headaches, nausea, and constipation, in particular during the adaptation phase. Multivitamin, mineral, and fibre supplements can be considered in some individuals to reduce side-effects. The nutritional adequacy of "keto" diet plans will depend on the overall diet composition and the nutrient sources.

A recent review of evidence on low and very low carbohydrate diets found them to be effective but not superior to other weight-loss diets.[19] There was no difference in weight loss between lower carbohydrate (4-45 percent calories)/higher fat (30-75 percent calories) diets compared to higher carbohydrate (50-65 percent calories)/lower fat (20-25 percent calories) diets when protein and energy levels were kept the same.[18,20] However, studies in patients who were overweight and diabetic following a low carbohydrate diet showed improvements in triglycerides and HDL cholesterol levels, insulin sensitivity, and glycaemic control with mixed effects on LDL cholesterol.[21,22]

One advantage that "keto diets" may offer is controlling the cravings and hunger often reported with other diet plans. A review published in 2015 found that individuals adhering to a ketogenic diet reported significantly less hunger and desire to eat compared with baseline.[23] Even though well-formulated ketogenic diets may offer short-term health benefits in some individuals, they are difficult to sustain, and long-term risks and benefits are not fully understood in the absence of long-term studies.

SPECIFIC DIETARY PATTERNS

Diets focusing on dietary patterns such as the Dietary Approaches to Stop Hypertension (DASH) diet, Mediterranean diets, and Plant-Based Diets (PBD) have also been studied in weight loss trials.

The DASH diet recommends specific servings of different food groups depending on daily caloric needs. It focuses on whole grains, fruits and vegetables, fat-free and low-fat dairy, lean meat, fish, and poultry. A meta-analysis revealed that overweight and obese adults on the DASH diet lose more weight than controls following a standard diet in studies ranging from 8-24 weeks.[24] Calorie-restricted DASH diets led to even greater weight loss when compared to other low energy diets.

Mediterranean diets emphasise the intake of vegetables, fruit, legumes, nuts, whole grains, and olive oil as the main source of fat, with moderate amounts of fish and poultry, low intake of red meat, and moderate consumption of wine. Meta-analysis of RCTs found that energy-restricted Mediterranean diets achieve as much or more weight loss than low-carbohydrate and low-fat diets with or without energy restriction among overweight and obese adults when followed for at least six months.[25]

A variety of PBDs including vegan and vegetarian diets have been investigated for their beneficial effects on weight loss

and associated comorbidities. In a recent systematic review, PBDs were found to be effective in reducing weight and waist circumference in individuals with T2DM, especially in studies with a duration of at least 16 weeks.[26] PBDs are characterised by high intake of dietary fibre from wholegrains, vegetables, and legumes, and low glycaemic index, which may enhance satiety and improve glycaemic control.

The DASH, Mediterranean diet, and PBDs can be safe, effective, and sustainable weight loss eating plans that also improve metabolic complications.

CONCLUSION

A variety of dietary approaches, with sufficient reduction in energy intake and high level of dietary adherence, can produce weight loss. IER and ketogenic diets are gaining popularity and have shown superiority in reducing body fat and improving obesity-related metabolic complications in the short term. However, studies have failed to establish the superiority of one diet plan over another in the long term. Weight loss interventions must address the underlying causes of overweight and obesity and facilitate sustainable behavioural and lifestyle changes to prevent and manage relapse.

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LEARNING POINTS

- **To date, studies have failed to demonstrate the superiority of one diet plan over another as patients can lose weight on any diet in the short term. Long-term effectiveness studies are lacking.**
- **Any dietary approach to weight loss should be individualised and consider the health status, personal preferences, and ability of the person to sustain the recommendations in the plan.**
- **As healthcare professionals, we should be realistic when discussing treatment expectations with our patients and provide ongoing support to ensure long-term weight loss maintenance and manage relapse.**