2019

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INTERRMITTENT FASTING IN WEIGHT MANAGEMENT

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Abstract
Obesity is associated with a variety of medical conditions that adversely affect metabolic and cardiovascular health. In order for health care providers to adequately educate and promote weight management, they need to be aware of the various dietary regimens and the efficacy and adverse effects associated with each. This literature review assesses the efficacy, metabolic benefits, and cardiovascular benefits of both intermittent energy restriction and continuous energy restriction from ten articles found on various databases within the past five years. The findings indicate that although not proven superior or inferior, intermittent energy restriction provides statistically similar results to continuous energy restriction when assessing efficacy of weight loss. There are also similar metabolic and cardiovascular benefits when comparing intermittent energy restriction and continuous energy restriction, although continuous energy restriction may have a benefit in the diabetic population due to potential adverse side effects in diabetics adhering to intermittent energy restriction. The result of this literature review allows providers to recommend an alternative weight management technique in patients who are unsuccessful or unable to adhere to a continuous energy restriction diet.

Keywords: intermittent fasting, intermittent energy restriction, continuous energy restriction, efficacy, weight loss, metabolic benefits, cardiovascular benefits

Introduction
• Obesity is defined as a weight that is higher than what is considered healthy for a specific height and is measured by using an adult body mass index, or BMI. The prevalence of obesity in United States adults was around 39.8% in 2015-2016. Medical conditions associated with obesity are some of the leading causes of preventable early death. The costs related to obesity were calculated to be $147 billion in 2008. (Center for Disease Control and Prevention, 2018)
• Weight loss using any technique decreases cardiovascular and diabetic risk factors including plasma glucose, insulin, triglycerides, and leptin (National Institutes of Health, 2016).
• Daily calorie restriction, or continuous energy restriction (CER), consists of limiting calories consumed throughout the day. Intermittent fasting, or intermittent energy restriction (IER), consists of intermittent periods of energy consumption, or intake of calories, alternating with intermittent periods of complete energy restriction, or lack of calorie intake.

Statement of the Problem
• There continues to be a variety of new weight loss mechanisms that are utilized despite lacking research on the efficacy and safety. Many of these dietary regimens also provide unrealistic goals for long term weight loss. Studies are needed to analyze the efficacy and safety of newer weight management methods that can treat or prevent obesity and improve health parameters.

Research Questions
• In overweight or obese adults, is intermittent fasting versus control more effective in decreasing body mass index and promoting health?
• In overweight or obese adults, does adherence to an intermittent energy restriction diet compared to a continuous energy restriction diet provide greater efficacy regarding weight loss and health benefit?

Literature Review

• Intermittent Energy Restriction
  • Weight Loss
    • IER showed statistically significant weight loss in comparison to control groups (p = 0.001) (Harris et al., 2018).
    • IER resulted in a 3.5 kg weight loss compared to a 2.0 kg weight loss in the control group (p = 0.03) (Li et al., 2017).
  • Health Benefits
    • Energy restriction resulted in decreased carbohydrate oxidation (p = 0.02) and increased lipid oxidation (p = 0.08), total energy restriction more than partial, in comparison to the isogenic control (Antoni et al., 2016).
    • Individuals adhering to IER had a lower risk of developing diabetes (p = 0.044), with two studies noting an overall decrease in coronary artery disease (p = 0.007; p = 0.019). One trial did note an increase in low density lipoproteins and high-density lipoproteins following fasting. Following evaluation of one day of fasting, with another study noting lower low-density lipoprotein cholesterol following six weeks of fasting. Another trial provided evidence that IER significantly increases HGH, increasing lipolysis and fat metabolism. (Horne et al., 2015)
    • Fasting showed a significant decline in systolic and diastolic blood pressure (p = 0.01; p = 0.003). A slight improvement in hemoglobin A1C was noted in fasting although this result was not statistically significant. No side effects were noted in participants adhering to either dietary regimen. (Li et al., 2017)

• Intermittent vs. Continuous Energy Restriction
  • Weight Loss
    • Weight loss between IER and CER subjects were not significantly different (p = 0.156), with approximately seven kilograms of weight loss noted (Harris et al., 2018).
    • Weight loss was shown in all IER groups regardless of length of study, with no significant difference noted upon comparison to CER weight loss (p = 0.458) (Headland et al., 2016).
  • Comparing IER to CER, the results showed no significant difference in efficacy regarding weight loss (Seimón et al., 2015).
  • Similar body weight reduction between the IER and CER groups (p = 0.001) (Carter et al., 2016).
  • Approximate 12.5% loss in body weight in both the CER and IER groups (Garthofer et al., 2018).
  • Sugar impact on weight loss (p = 0.6) and waist circumference between the groups (Sundfør et al., 2018).
  • CER provided increased weight loss and a beneficial effect on insulin resistance, although both diets had a decrease in body mass index (Aksungar et al., 2016).