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### RESEARCH ARTICLE

#### INTERMITTENT FASTING FACTS AND MYTHS: METABOLIC BENEFITS OF INTERMITTENT FASTING

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#### Abstract

In this review article, there is a collection of evidence that describes the myths and facts regarding intermittent fasting (IF). Fasting is an age old practice, often done for religious reasons, but fasting for weight loss is still capturing the public imagination. Intermittent fasting and Calories restriction (CR) is worldwide popular in men and women of all ages, it has become fitness trend to help them maintain health and lose weight. It also has positive as well as negative impacts on metabolic activities. There are potential researches that analyze IF and CR as beneficial for Weight loss, Cardiovascular diseases, Cancer, Cognitive, Type 2 diabetes, and reduce Oxidative stress. Similarly, there are some facts and myths that are related to IF and CR which are worth knowing.

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#### Introduction:-

Intermittent fasting is most commonly adapted by overweight individuals, who want to lose weight. Fasting is defined as a period of voluntary abstinence from food and drink. People fast for many reasons like health, weight loss and few for spiritual reasons. This approach doesn't change what you eat, and rather it changes once you eat. Intermittent fasting is a pattern of eating, it isn't a diet plan. Intermittent fasting has several different approaches for fasting. Time restricted fasting, this time pattern is understood because of the 16:8 fast, meaning that you simply eat in an 8 hour eating window and people can initially choose 12:12 pattern like 8:00 a.m. to 8:00 p.m. and people can also follow 14:10 pattern like 11:00 a.m. to 9:00 a.m. to ease into it. As it is an advanced proponent you may lean towards 18:6 patterns. The eating window is often tailored to what works best for your schedule. Mostly people consider this to be the most sustainable approach to fasting.<sup>12</sup> Time restricted fasting is the period eat for the eating, it is used to tailored to what works best for your schedule.

Modified fasting, it involves the 5:2 diet pattern which means normal eating for five days and fasting for 2 days. On the 2 fasting days, you are allowed to eat 500 calories either as one meal or as smaller meals (100 calories eaten five times). On the other hand 5 days, you'll eat and drink whatever you would like. Modified diet was popularized by 'The Fast Diet' book by Dr. Michael Mosely. On the another variation of this means fasting on two nonconsecutive days per week with only a 25% reduction in daily calories consumed. Alternate day fasting, this approach is that the simplest to know, and involves alternating fasting days with eating days. Sometimes mentioned because of the

24hour fast, you merely fast for a 24hour period. This could mean eating breakfast and lunch at some point then fasting until lunch the subsequent day. It could also be a normal day of eating until dinner time followed by a 24 hour fast until dinner the next day. It is possible for some people to push this to a 36hour fast that starts after dinner

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on day one and doesn't end until breakfast on day three. Prolonged fasting, this type of fasts can extend into 48 hours or maybe every week or more. Mostly, these are for spiritual as well as for religious purposes. Prolonged fasting can accompany significant risks to our health and will not be attempted without discussing them with your health care provider to know the risks and potential complications.<sup>6</sup>

Hunger is usually not that big issue, although it can be a problem in the beginning, while your body is getting used to not eating for extended periods. No solid and semisolid food is allowed during the fasting period, but you'll take liquid food items like water, coffee, tea, and other no-caloric beverages. There are various researches published that broadly explain the advantages as well as disadvantages of intermittent fasting. The researchers searched dozens of animal and human studies to elucidate how simple fasting is helpful to improve metabolism, lowering blood sugar, lessens inflammation, arthritic pain to asthma and even helps clear out toxins and damaged cells, which lowers the risk for cancer and enhances brain function.<sup>5</sup> The truth behind intermittent fasting is comparatively simple, "When our insulin levels go down far enough and for long enough, as they are doing during a fasting period, we're able to burn off fat."<sup>4</sup>

According to World Health Organization (WHO) in 2016 reported that more than 1.9 billion people in the world were overweight and over 650 million people were obese which has tripled in number since 1975.<sup>1</sup> Lifestyle changes are one of the most effective methods in reducing weight and the risks for cardiovascular diseases. There are many sorts of diet and exercises programs available for weight loss, however, one among the smallest amount recognized diet changes is that the alternate day fasting (ADF) which incorporates eating 20% of energy requirements on a quick day then consume food ad-lib on the feed days which has been suggestive to be highly effective for weight loss. The review aims to summarize the effects of ADF/intermittent fasting on weight loss, the influence on biomarkers, and cardiovascular risk factors thereby assessing it as a choice for a healthier lifestyle.<sup>2</sup>

According to an article written by the Harvard Health Blog, intermittent fasting is safe and incredibly effective, but no more effective than any other diet. In addition, many of us find it difficult to fast. But a growing body of research suggests that the timing of the fast is vital, and may make IF a more realistic, tenable and effective approach for diabetes prevention, as well as for weight loss.<sup>5</sup>

### **Material and Method:-**

The review article is the collection of data from research papers, articles, and online citations on health, nutrition, intermittent fasting with the latest updates. And finally, collaborate on the complete data based on evidence provided in the research papers.

### **Facts Regarding Intermittent Fasting**

Dieting generally can produce orthorexia, a disorder that involves an unhealthy obsession with healthy eating. Signs of orthorexia include the necessity to talk about your diet all the time and obsession to preoccupied with your next meal.

Intermittent fasting also have an impact on your sleep cycle and cause restless nights. Multiple investigations have shown that fasting can decrease your amount of REM sleep, which is believed to improve memory, mood, and learning capacity.<sup>3</sup> We are now at a stage where our knowledge of both the genetic and environmental factors which have been linked to unsuccessful brain aging, and their cellular and molecular consequences, can be utilized to provide the general population with advice on aging successfully.<sup>14</sup>

Intermittent fasting for an extended period can increase levels of cortisol, the body's stress hormone, Even if there are potentially some positive health benefits may reduce the danger of diabetes, cancer, and heart condition.<sup>3</sup> Mattson has also researched the protective benefits of fasting to neurons. If you don't eat for 10–16 hours, your body will attend its fat energy stores, and fatty acids called ketones are going to be released into the bloodstream. This has been shown to protect memory and learning functionality, says Mattson, as well as slow disease processes in the brain.<sup>10</sup>

Intermittent fasting in animal models induces some cardiovascular benefits like improving vital signs and pulse, also as circulating cholesterol and triglycerides and reduces carotid intima-media thickness. Moreover, it improves survival from myocardial ischemia through proangiogenic, antiapoptotic, and antiremodelling effects.<sup>7</sup>

There are several changes occur in our bodies during fasting. Insulin level in blood drops significantly, which facilitates fat burning. The blood levels of somatotropin may increase the maximum amount as 5fold higher levels of this hormone facilitate fat burning and muscle gain and have numerous other benefits. The body induces important cellular repair processes, such as removing waste material from cells. There are beneficial changes in several genes and molecules associated with longevity and protection against disease.<sup>8</sup> Caloric restriction and weight loss are important factors for remission of T2D, as recently demonstrated in an openlabel Diabetes Remission clinical test (DiRECT). The DiRECT study showed diabetes remission and maintenance through caloric restriction (~840 calories/day) and weight loss during a noninsulin-dependent diabetic population.<sup>11</sup>

The brain health is one of the important metabolic features which is improved by intermittent fasting. There is reduction of oxidative stress, reduced inflammation, and a discount in blood glucose levels and insulin resistance. Many investigations in rats have shown that intermittent fasting may increase the expansion of the latest nerve cells, which should have benefits for brain function. It also increases levels of a brain hormone called brain-derived neurotrophic factor (BDNF), a deficiency of which has been implicated in depression and various other brain problems. Many animal studies have also shown that intermittent fasting protects against brain damage leads to strokes. In several human studies on intermittent fasting, fasting blood sugar has been reduced by 36%, while fasting insulin has been reduced by 20-31%.<sup>8</sup>

During fasting, the cells in the body initiate a cellular "waste removal" this process called autophagy. It involves the breaking down of the cells and metabolizing broken and dysfunctional proteins that build up inside cells over time. Increased level of autophagy may protect against several diseases, including cancer and Alzheimer's disease. The continuous calorie restriction by intermittent fasting extends lifespan. Several studies on rats shown that, rats that fasted one among them every other day lived 83% longer than rats that did not fast. Although this is often far away from being proven in humans, intermittent fasting has become very fashionable and likeable among the anti-aging crowd. It gives the benefits for metabolism and everyone kind of health marker, it can be estimated that intermittent fasting could assist you to live an extended and healthier life.<sup>8</sup>

### **Myths Regarding Intermittent Fasting**

First of all, let's begin with the myth that is related to weight loss. No doubt the intermittent fasting play important role in losing weight, but "It doesn't matter how long you fast if, you're breaking the fast by throwing down burgers, pizza, and candy, results are getting to be slim to none," Dr. Robert Zembroski said. "I.F. works hand in hand with a healthy diet. Each fasting period cannot be treated as a cheat day for the diet to work." It directly means the Calorie restriction (CR) plays a crucial part with Intermittent fasting (IR).<sup>9</sup>

Some people claim that the brain will stop functioning if you don't eat carbs every few hours. This assumption supported that your brain can only use glucose for fuel. However, your body can easily produce the glucose it needs via a process called gluconeogenesis. Even during long term fasting, starvation, or very low carb diets, your body can produce ketone bodies from dietary fats. Ketone bodies can feed parts of your brain, reducing its glucose requirement significantly. However, some people report feeling fatigued or shaky once they don't eat for a short time. In such cases, a person should keep snacks on hand and eating more frequently.<sup>8</sup>

Many people believe that eating more meals increases your rate, causing your body to burn more calories overall. Your body indeed expends some calories digesting meals. This is termed the thermic effect of food (TEF) on average, TEF uses around 10% of your total calorie intake. However, what matters is that the total number of calories you consume not what percentage of meals you eat. Eating six 500calorie meals has an equivalent effect as eating three 1,000calorie meals. Given an average TEF of 10%, you'll burn 300 calories in both cases. Numerous studies demonstrate that increasing or decreasing meal frequency doesn't affect total calories burned.

While you will have gotten stories that intermittent fasting creates problems to your health, studies expose that it has several remarkable health benefits too. For example, it prolongs the lifespan in animals and changes your organic phenomenon connected with permanency and immunity has been shown. It also has greater impact on the metabolic health, develop insulin sensitivity and reduced oxidative stress, inflammation, and heart related risk. Intermittent fasting help to boost the brain health by elevating levels of Brain Derived Neurotrophic Factor (BDNF), it's a hormone that protect against mental conditions, depression and various other.<sup>8</sup>

The one of the huge misconception about fasting is that digestion doesn't occur after a particular time period, this is not true, it is just a myth. Human body will digest food no matter what time it is. It is necessary to have sufficient and accurate knowledge of effect of intermittent fasting on body and to focus on other metabolic processes like autophagy and cellular repair, instead of diverting attention to digestion.<sup>9</sup>

### Summary and Conclusion:-

More than ten studies were included in this review. The intermittent fasting and Calories restriction regimens varied across studies and included alternate day fasting, prolonged fasting, modified fasting, and time restriction fasting. Half of the studies included the facts related to intermittent fasting and its impact on our metabolism and another half of the studies point out the myths that are more popular if we will do intermittent fasting and calorie restriction. Overall analyses showed that intermittent fasting and calorie restriction diet is good if you want to lose weight and it should only be followed under the guidance of experts and doctors. Intermittent fasting may be an effective strategy for the treatment of overweight and obesity. Intermittent fasting can be comparable to calories restriction for short-term weight loss in overweight and obese adults.

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