



Exploring the Favorable and Adverse Physiological Responses Caused by the Misinformation of Fad Diets

Alex Chirayath

Introduction

In recent years, obesity has become one of the most prominent health issues around the world. According to The New England Journal of Medicine, “In 2015, a total of 107.7 million children and 603.7 million adults were obese. Since 1980, the prevalence of obesity has doubled in more than 70 countries and has continuously increased in most other countries” (Afshin et al., 2017). This exponential increase in obesity has led to many individuals wanting to lose weight in a quick manner, resulting in the popularity of fad diets, which are diets that lack any scientific basis. However, many marketing companies or influencers have been known to exploit this new trend in fad diets for profit by promoting a specific fad diet as the “best” or “fastest” for weight loss. This prompts the question of the extent to which the scientific misinformation of fad diets impacts individuals. The three most compelling arguments when it comes to fad diets are that they can negatively affect functions/processes within the body, can be successful in aiding weight loss, and can cause nutrient deficiency.

Impact on Physiological Functions

Fad diets can have a detrimental effect on many processes within the body. Certain food groups allow the body to carry out different bodily processes, so when fad diets recommend the removal or decrease of an entire food group, the normal functioning of the body can be disrupted. For example, the Ketogenic diet encourages carbohydrate restriction, which induces ketosis and fatty acid oxidation. The peer-reviewed British Journal of Nutrition explains the scientific causes behind the side effects of a Keto Diet, including ketosis, an increase in acetone concentrations, the switch from utilizing carbohydrates to using fat stores for ATP production, a low amount of blood glucose, a gastrointestinal response to a high fat intake, and an excess amount of uric acid in the blood (Ashtary-Larky et al., 2021). This list helps with understanding the physiological causes associated with common symptoms of a Keto Diet. Another fad diet that restricts carbohydrate intake is the South Beach diet and therefore has a similar physiological response as the Keto Diet. A case report documented by Dr. Swapna Chalasani and Dr. Jacqueline Fischer, doctors in internal medicine, said that the mechanisms that occurred within a patient on the South Beach Diet starts with the breakdown of fats into ketones, which accumulates acetyl-CoA, and initiates ketogenesis. In some cases, like the patient mentioned in the case study, there is a buildup of acetyl-CoA, resulting in ketoacidosis (Chalasani and Fischer, 2008). Similarly, the Atkins Diet, Zone Diet, and Dukan Diet all promote high protein intake, which can throw off the acid and base balance in the body. This is supported by Jomana Khawandanah, a clinical dietitian, and Ihab Tewfik, a registered nutritionist, “After six weeks of such a diet [a high-protein diet] there is an increased acid load to the kidney maximizing the possibility of stone formation and a decrease of calcium balance leading to bone loss and osteoporosis” (Khawandanah and Tewfik, 2016). Information from *Nefrología*, a peer-reviewed journal of nephrological clinical research, makes it apparent that the observation discussed in Khawandanah and Tewfik’s journal is due to protein causing an increase in acid production, which can bring about an acidosis state that is associated with the side effects from the study (Osuna-Padilla et al., 2019).

Although most Fad diets lack a scientific basis, they can be successful in aiding initial weight loss. The keto diet causes accelerated weight loss because of carbohydrate deletion, leading to ketosis, which means that the body will switch from carbohydrates as its main fuel source to using fat and ketones (chemicals produced by the liver from fat). This is reinforced by the peer-reviewed Indian Journal of Medical Research in which it says, "When unlimited intake of proteins and fats was permitted, the fat intake actually decreased and the protein intake increased only slightly. Thus, the caloric reduction was mainly due to reduction in carbohydrate" (Joshi and Mohan, 2018). A high-protein diet also can be beneficial to weight loss, as observed from a study mentioned in Nutrition Reviews, which was published by Oxford University's peer-reviewed journal database, "That study examined the effects of higher dietary protein intake (25% vs. 12% energy intake) on weight loss in obese subjects and found that weight and fat loss were significantly greater in the high-protein group" (Eisenstein et al., 2002). Another fad diet that is rising in popularity is Intermittent Fasting (IF), which works by manipulating the time of food consumption in order to create a calorie deficit and use fat stores more effectively. The Canadian Family Physician, a peer-reviewed medical journal, reported that IF induced a weight loss between 0.8% to 13.0% of the baseline body weight, BMI decreased by 4.3%, and waist circumference reduced by 3-8 centimeters (Welton et al., 2020). This proves that IF can work for weight and fat loss, helping individuals reach their desired body composition.

Unsustainable Weight Loss

On the other hand though, fad diets are known to not be sustainable for weight loss in the long term, and can cause the weight to be regained. The most common example of this is in low calorie diets, according to a Human Nutrition Professor at University of Maastricht, Wim H.M. Saris, "Both among laymen and professionals it is believed that the initial greater weight losses achieved with VLCD [Very Low Calorie Diets] is followed by larger weight regains ending in an even worse body-weight status" (Saris, 2001).

Inadequate Nutrition

Finally, most fad diets do not encourage adequate nutrition intake and prioritize the removal of food groups or an increase in other groups. Dr. Loren Cordain, a professor in the field of nutrition and exercise science, states that, "In addition, the CHO limit (25-50 g or 100-200 kcal) required by VLCKD [Very Low Calorie Ketogenic Diet] further restricts consumption of fruits and vegetables which are rich dietary sources of potassium, calcium, magnesium, folate and vitamin C" (Cordain, 2018). This reveals how a VLCKD diet does not provide a balanced and nutritious diet and therefore is not a sustainable and healthy diet. Likewise, another prevalent fad diet, known as the Gluten-Free Diet, has been proven to not have a sufficient amount of vital nutrients. Leigh Mattson, a licensed dietitian, declared that, "A Gluten-free diet has also been reported to be low in B-vitamins, folate, and iron, because these nutrients are often missing in the gluten-free counterparts" (Mattson, 2018). Furthermore, the Vegetarian diet is also a fad diet, and excludes all meat. However, meat is one of the main sources of protein, making it difficult for vegetarians to consume the recommended amount of protein and other nutrients that come from meat. Rachel Freire, a postdoctoral researcher from Harvard Medical School wrote,

“[The] exclusion of animal products can reduce the intake of certain nutrients, which might lead to nutritional deficiencies of protein, iron, zinc, calcium, and vitamins D and B12” (Freire, 2020).

Conclusion

Given the scientific considerations in this report, it can be concluded that despite fad diets being a quick path to weight loss, there are many misconceptions about what they actually do to the body. This was discussed by analyzing three specific viewpoints which were fad diets having an adverse effect on bodily processes, a beneficial influence in weight loss, and a risk of nutrient deficiencies. Khawandanah and Tewfik proposed a solution to the sustainability issue of fad diets by recommending the implementation of diets that are high in fruits and vegetables but low in fat and sugars, and also suggested to educate the public on the importance of a balanced diet, such as the eatwell plate (Khawandanah and Tewfik, 2016). However, possible limitations of enforcing this solution could be that some individuals have different nutritional needs or that they do not have access to healthy foods due to its high expense.

Reference

Ashtary-Larky, D., Bagheri, R., Bavi, H., Baker, J. S., Moro, T., Mancin, L., & Paoli, A. (2021). Ketogenic diets, physical activity and body composition: a review. *British Journal of Nutrition*, 127(12), 1898–1920. <https://doi.org/10.1017/s0007114521002609>

Chalasan, S., & Fischer, J. (2008). South Beach Diet associated ketoacidosis: a case report. *Journal of Medical Case Reports*, 2(1). <https://doi.org/10.1186/1752-1947-2-45>
Cordain, L. & Colorado State University. (2018). Nutritional deficiencies of ketogenic diets. In Preprint. <https://doi.org/10.13140/RG.2.2.19094.19526>

Eisenstein, J., Roberts, S. B., Dallal, G. D., & Saltzman, E. (2002). High-protein Weight-loss Diets: Are They Safe and Do They Work? a Review of the Experimental and Epidemiologic Data. *Nutrition Reviews*, 60(7), 189–200. <https://doi.org/10.1301/00296640260184264>

Freire, R. (2020). Scientific evidence of diets for weight loss: Different macronutrient composition, intermittent fasting, and popular diets. *Nutrition*, 69, 110549. <https://doi.org/10.1016/j.nut.2019.07.001>

Health Effects of Overweight and Obesity in 195 Countries over 25 Years. (2017). *New England Journal of Medicine/the New England Journal of Medicine*, 377(1), 13–27. <https://doi.org/10.1056/nejmoa1614362>

Joshi, S., & Mohan, V. (2018). Pros & cons of some popular extreme weight-loss diets. *Indian Journal of Medical Research*, 148(5), 642. https://doi.org/10.4103/ijmr.ijmr_1793_18

Khawandanah, J., & Tewfik, I. (2016). Fad Diets: lifestyle promises and health challenges. *Journal of Food Research*, 5(6), 80. <https://doi.org/10.5539/jfr.v5n6p80>

Osuna-Padilla, I. A., Leal-Escobar, G., Garza-García, C., & Rodríguez-Castellanos, F. E. (2019a). Dietary acid load: Mechanisms and evidence of its health repercussions. *Nefrología*, 39(4), 343–354. <https://doi.org/10.1016/j.nefro.2019.08.001>

Osuna-Padilla, I. A., Leal-Escobar, G., Garza-García, C., & Rodríguez-Castellanos, F. E. (2019b). Dietary acid load: Mechanisms and evidence of its health repercussions. *Nefrología*, 39(4), 343–354. <https://doi.org/10.1016/j.nefro.2019.08.001>

VanBeber, A. (2018). Fad diets or exercise? Maintaining weight among millennials. <http://repository.tcu.edu/handle/116099117/22372>

Welton, S., Minty, R., O’Driscoll, T., Willms, H., Poirier, D., Madden, S., & Kelly, L. (2020, February 1). Intermittent fasting and weight loss: Systematic review. *The College of Family Physicians of Canada*. <http://www.cfp.ca/content/66/2/117.full>