

Opinion

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Plant-Based Diets (PBDs): Challenges and Solutions

Dasaad Mulijono^{1,2,3*}

¹Director of Cardiology, Department of Cardiology, Bethsaida Hospital, Tangerang-Indonesia

²Indonesia College of Lifestyle Medicine, Indonesia

³Professor of Cardiology, Department of Cardiology, Faculty of Medicine, Prima University, Medan-Indonesia

***Corresponding author:** Dasaad Mulijono, Director of Cardiology, Department of Cardiology, Bethsaida Hospital, Tangerang-Indonesia, Indonesia College of Lifestyle Medicine, Professor of Cardiology, Department of Cardiology, Faculty of Medicine, Prima University, Medan-Indonesia, Indonesia.

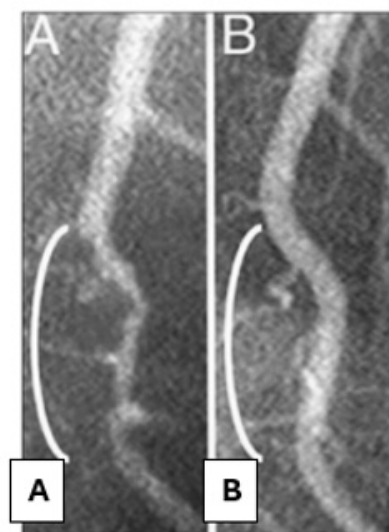
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Opinion

It has been more than three decades since the publication of Dean Ornish et al.'s study on whether lifestyle changes can reverse coronary heart disease [1]. This prospective, randomized, controlled trial included only 28 patients in the lifestyle arm who were required to follow a low-fat vegetarian diet, stop smoking, receive stress management training, and engage in moderate exercise. After one year, the results showed that the lifestyle intervention was effective in reversing the progression of coronary lesions, while those who continued with their unhealthy lifestyle

habits experienced further progression in their coronary vessels. I was doing my residency training in Internal Medicine at the time. Was I aware of that publication? Yes, it had been discussed among the physicians at our hospital in Australia. Did anyone take the study seriously? No. Then, in 2014, Caldwell B Esselstyn Jr et al. presented a famous image, as depicted in Figure 1, which illustrated that strict plant-based diet (PBD), can regress coronary stenosis [2]. Esselstyn's famous word "no oil" reverberated in many PBD public symposiums.



Coronary angiographically reveals A-> a stenosis 80-90% in the distal left anterior descending artery (LAD), B-> after 32 months of a plant-based intervention, the LAD became normal (0%).

Figure 1: Reversal of coronary artery disease.

Ornish and Esselstyn were widely recognized as the pioneers of the PBD movement. Since the publication of their work, Ornish has provided guidance and support to numerous high-profile individuals, including former President Clinton, King Charles, and other prominent figures. His lifestyle program for reversing heart disease without medication or surgery has even received reimbursement from health insurance. Additionally, Kim A. Williams, who served as the president of the American College of Cardiology (ACC) from 2015-2016, famously stated, "There are two kinds of cardiologists: vegans and those who haven't read the data." As a leading figure within the ACC, Williams has significantly impacted the inclusion of healthy lifestyle practices in the organization's guidelines. Kim began adopting a PBD lifestyle not during his childhood but rather after being diagnosed with hypertension and being unable to tolerate the prescribed medications. Consequently, he decided to embrace a healthy lifestyle, which proved to be highly effective for him. Since then, he has become a public figure advocating for healthy PBDs.

At the outset, I was skeptical about the significance of the revelations purported to represent a landmark achievement in combating coronary artery disease. Nonetheless, upon receiving a diagnosis of coronary calcification and intermediate stenosis ($\pm 50\%$ stenosis on my LAD) from my coronary artery calcium (CAC) and computed tomography coronary angiography (CTCA), I resorted to embracing the recommendations put forth by these experts in the field of PBD. After three years, my 50% LAD stenosis had regressed to 20-30%, and my CT calcium reading had decreased by 30%. Additionally, I discovered that this method effectively regressed atherosclerosis and reduced the incidence of my patient's ISR and ST. My 3500 elderly high-risk cardiology patients with COVID-19 were saved by following PBDs. Most of my patients with COVID-19 who followed the PBDs program had mild illness, did not show any disease progression, were not hospitalized, and experienced zero mortality. During COVID-19, the situation was different due to the shortage of hospital beds and doctors. Most COVID-19 patients who sought help were willing to follow any advice to become plant-based eaters. Furthermore, they witnessed numerous mortalities of COVID-19 patients who were admitted to top hospitals in Indonesia despite the utilization of ample medications and high-tech medical facilities. How about cardiology patients? What percentage of them would be willing to follow PBD? Perhaps only a third would strictly follow, a third would follow partly, and a third would refuse. This scenario would also apply to my family, colleagues, and friends.

In this paper, I will discuss why so many patients and medical professionals are against PBD. Food serves as both a religious and cultural practice. Various faiths consider the consumption of specific unhealthy foods to be virtuous based on their beliefs. Certain cultures associate particular foods with social standing; individuals who can afford luxury, mostly unhealthy foods, are perceived to be of higher status [3]. People may feel that their dietary choices, even if unhealthy, are correct and justified and take pride in adhering to these practices. On the contrary, unhealthy food options are considerably more affordable than their healthy counterparts, and the added convenience of doorstep delivery

for such foods further diminishes the appeal of preparing healthy meals at home. Our parents used to advise us to study diligently so that one day we might achieve success and happiness, enabling us to savor delectable cuisine. For numerous individuals, the consumption of pleasurable cuisine forms a crucial component of their existence within the realm of this world.

Food is generally considered to be more valuable than sex. In underdeveloped nations, where living conditions may be poor, people often derive pleasure from love, food, and sex. Unhealthy, inexpensive foods are one way to meet basic human needs and find happiness. Studies have demonstrated that these unhealthy foods can have hormonal effects by releasing substances such as serotonin, dopamine, endorphins, cortisol, adrenaline, melatonin, and oxytocin, which can lead to feelings of happiness and addiction. However, it is important to note that healthy foods may also have the ability to produce these "happy hormones" if one knows how to choose the right foods [4-6]. Education seemed to have minimal impact on these issues. Many highly educated individuals, including medical professionals with doctorate degrees, appear to be drawn to the allure of unhealthy foods despite their negative impact on their health. Indeed, I have personally known professors who have multiple stents implanted in their coronary arteries but have been unable to resist the pleasure of consuming these unhealthy foods.

Individuals commonly appear to be motivated by the pleasure-pain principle. They typically regard a healthy PBD as an unpleasant experience, while an unhealthy diet is viewed as enjoyable. Interestingly, even those who have already associated healthy PBD with pain have never attempted to determine if this perception is accurate or not [7,8]. For the pleasure of consuming delectable sugary foods, processed foods, fatty foods, meat and other animal products (milk, cheese, butter), deep-fried foods, and oils, people are willing to undergo the amputation of their foot due to diabetes, have their chest cut open due to coronary artery disease, and undergo the removal of an organ plus chemotherapy and radiotherapy due to cancer. The pleasure derived from consuming this unhealthy food is so great that some individuals are even prepared to lose their lives due to it. The idea that pleasure can engender such blind faith in individuals, leading them to believe that they are immune to the consequences of disease disasters, which befall only the unfortunate few.

The absence of consensus and support among medical professionals for PBDs is a significant issue. Despite the overwhelming evidence supporting their efficacy, many medical professionals remain opposed to PBDs. This may be due to their lack of knowledge and understanding about the role of healthy diets in preventing chronic medical conditions such as obesity, hypertension, hyperlipidemia, insulin resistance, atherosclerosis, stroke, certain autoimmune diseases, and certain types of cancer. A study showed that more than 70% of medical students receive less than 2 hours of nutritional training during their medical course [9]. Many doctors view their role as focusing primarily on curing patients with medication or advanced tools rather than to educate their patients to follow PBD. Moreover, most doctors prefer practicing curative medicine rather than preventive medicine. The

issue of financial incentives also arises, as physicians may profit more by prescribing medications or utilizing medical devices instead of instructing their patients about PBDs. Furthermore, teaching patients about PBDs necessitates patience, empathy, and a substantial amount of time, all of which may be scarce in today's hurried medical environment. In my practice, for instance, an interventional cardiologist is highly respected for their ability to perform complex coronary cases as a curative measure rather than to prevent their patients from requiring intervention in the first place. Who will applaud the physician who employed dietary adjustments to forestall patients from experiencing their initial heart attack when compared to the doctor who utilized a small, intricate, sophisticated, high-tech device called a stent to treat individuals who have already suffered a heart attack? As the Chinese proverb states, "The superior doctor prevents sickness. The mediocre doctor attends to impending sickness. The inferior doctor treats actual sickness" [10]. Subconsciously, people tend to support inferior doctors instead of superior ones who prevent illness. The same analogy applies to security guards. People are more likely to show respect to those who recover their stolen belongings rather than those who prevent their houses from being stolen in the first place. Consequently, the latter may not receive the recognition they deserve.

Medical professionals who frequently oppose PBD often maintain close ties with companies that market unhealthy products. Funded by these companies, some medical professionals are willing to conduct research to demonstrate unhealthy diets to appear healthy. Many medical practitioners will only accept PBD if there are extensive, randomized, double-blind, controlled studies that prove it as a "cause-effect" relationship. However, conducting double-blind food science research is difficult because researchers and participants are likely to recognize and know what the participants are consuming. Additionally, conducting completely unbiased research on foods is impossible because patients may not follow the researchers' instructions truthfully unless the research is undertaken in a confined place where food intake can be monitored closely. The timeline for food research can span several years. Understandably, seldom has such high-profile PBD research been published. Most PBD research has been conducted through questionnaires where participants reported what they ate several months before the assessment [11,12]. As a result, the findings of such research often receive many skeptical comments.

In today's modern societies, becoming a doctor often requires significant financial investment during one's education. Therefore, one may wonder if doctors still adhere faithfully to the Hippocratic Oath. The use of PBD has been shown to be effective in treating various chronic inflammatory diseases, such as coronary artery disease, hypertension, diabetes, and many more [13-19]. If a patient's condition improves after adopting a healthy lifestyle, the doctor may no longer need to do follow-up. As a result, doctors may have decreased income, and hospitals may have many empty beds. In the past, education for doctors was free, and doctors were more willing to genuinely help patients without expecting any reward. Given the aforementioned information, it is perplexing that numerous patients still refuse to adhere to a healthy lifestyle,

which could potentially result in their disease remission. Maybe these patients worry about the financial strain that will impact healthcare providers. I was moved to tears.

It is likely that in the near future, the government will require physicians to incorporate lifestyle programs for their patients as a means to decrease healthcare expenditures. In the past, interventional cardiologists typically performed stent procedures for patients with any form of blockage, mostly for those with chronic coronary syndrome (CCS). However, the government has since recognized the opposition to this practice and has begun to support doctors who take an alternative approach. The latest guidelines now indicate that, for individuals with CCS, long-term treatment with intensive/ optimal medical therapy (OMT) yields the same cardiovascular outcomes as percutaneous coronary intervention (PCI) plus OMT, as demonstrated by the Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation (COURAGE) trial [20], the Objective Randomized Blinded Investigation with Optimal Medical Therapy of Angioplasty in Stable Angina (ORBITA) trial [21], and the International Study of Comparative Health Effectiveness with Medical and Invasive Approaches (ISCHAEMIA) trial [22], all of which were funded by the government at the cost of hundreds of millions of dollars. The indications for implanting stents in CCS patients have now been limited to cases where the patient experiences symptoms despite receiving OMT. In the future, due to the substantial financial restrictions in healthcare, the government may prefer to fund researchers who can demonstrate the effectiveness of a more affordable approach and lifestyle interventions, such as PBDs, to reduce patients' dependence on medications and medical devices and ultimately save government healthcare costs. As I mentioned before, funding large bona fide PBD studies will be challenging and very expensive.

During times of crisis, such as the COVID-19 pandemic, patients are often willing to take extreme measures to avoid pain and death, as my experiences during the pandemic have shown. I have treated 3500 patients with PBD and supplements, and almost none of them objected to the interventions I ordered them to follow. As a result, none of these patients experienced disease progression, none were hospitalized, and no deaths occurred. Similarly, in my own case, when I was diagnosed with coronary obstruction, I was desperate to find any means to reduce my obstruction. Since I could not undergo coronary intervention due to my chronic peptic ulceration where taking antiplatelet medication for life was not an option. In such situations, patients may resort to desperate measures; another example is Kim A. Williams, who tried altering his lifestyle to treat his hypertension due to his intolerance to antihypertensive medications. However, the sense of desperation is subjective, and some patients may not necessarily embrace lifestyle interventions even when they are desperate for a solution. Even patients with multiple chronic inflammatory diseases have a history of stroke or have multiple stents inserted in their coronary arteries; despite these circumstances, they may not desperately seek cures for all their diseases. The gravity of this situation is contingent upon societal views, much like the case of smoking in the past. Physicians even recommended smoking to their patients due to their misguided belief that it was beneficial for their health. However, as

research and development progressed and time passed, smoking came to be recognized as a health hazard. Therefore, individuals who formerly held misguided beliefs may now find themselves in a state of despair, resorting to any means necessary to break their unhealthy habits based on the societal norms and resources available at that time.

Numerous patients and healthcare professionals perceive lifestyle modifications as a radical shift. As Caldwell Esselstyn once stated, "Some individuals consider a whole foods PBD to be extreme. Nevertheless, half a million individuals undergo invasive coronary artery bypass graft surgery annually, which involves opening the chest and harvesting a vein from the leg. Yet, such a procedure is not typically considered extreme." Their perception of radicalism is shaped by the prevailing culture of consuming unhealthy foods in daily life. However, once the incorrect social perception of this culture disappears, their habits will change in response. It is hoped that in the future, this shift towards a healthier lifestyle will result in a reduction of disabilities caused by the consumption of unhealthy foods, leading to a happier way of life. It is anticipated that a significant proportion of the population will, in the future, enjoy extended lifespans characterized by enhanced well-being as a result of adopting healthy lifestyle choices.

The majority of PBD experts make a grave error by advocating for a flawless PBD lifestyle without acknowledging the possibility that it may be deficient in essential nutrients, including protein, omega 3 (EPA and DHA), vitamin B12, and D, as well as minerals such as iodine, iron, zinc, selenium, and calcium [23]. In contrast, an omnivorous diet has been shown to promote chronic inflammation, increase LDL levels, oxidize LDL into even more dangerous cholesterol (i.e., oxLDL), increase oxidative stress, raise biomarkers of inflammation such as hs-CRP, IL-6, increase pro-inflammatory mediators, and pro-inflammatory chemokines/cytokines, as well as Trimethylamine N-oxide (TMAO), persistent organic pollutants (POPs), promote tumor growth, and other harmful effects. An omnivorous diet may also lack essential nutrients such as fiber, nitric oxide, carotenoids, isoflavones, phytoestrogens, and phytosterols (polyphenols and phytonutrients), as well as certain vitamins, including vitamin D, and minerals, such as zinc, copper and selenium [24,25]. The main point is that both diets have positive and negative effects. As medical professionals, we ensure that our patients benefit from adhering to a diet that aligns with their health goals. The focus should not be on winning a debate about which diet is superior but on using available data and research to make informed decisions based on evidence-based practices.

I am certain that the COVID-19 pandemic will usher in substantial transformations, and life will never be the same after this crisis. In recent times, there has been a noticeable trend towards individuals adopting healthier lifestyles. It remains to be seen how these changes will unfold. Eventually, it is possible that consuming unhealthy foods will be regarded as a hazard, similar to the unfortunate fate of the smoking industry.

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Conflict of Interest

The authors declare no conflict of interest.

References

- Ornish D, Brown SE, Scherwitz LW, Billings JH, Armstrong WT, et al. (1990) Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial. *Lancet* 336(8708): 129-133.
- Esselstyn CB Jr, Gendy G, Doyle J, Mladen Golubic, Michael F Roizen (2014) A way to reverse CAD. *J Fam Pract* 63(7): 356-364b.
- Drees BM, Barthel B (2022) We Are What We Eat. *Mo Med* 119(5): 479-480.
- Dfarhud D, Malmir M, Khanahmadi M (2014) Happiness & Health: The Biological Factors- Systematic Review Article. *Iran J Public Health* 43(11): 1468-1477.
- Holder MD (2019) The Contribution of Food Consumption to Well-Being. *Ann Nutr Metab* 74(2): 44-52.
- Wahl DR, Villinger K, König LM, Ziesemer K, Schupp HT, et al. (2017) Healthy food choices are happy food choices: Evidence from a real life sample using smartphone-based assessments. *Sci Rep* 7(1): 17069.
- Bédard A, Lamarche PO, Grégoire LM, Guy CT, Provencher V. et al. (2020) Can eating pleasure be a lever for healthy eating? A systematic scoping review of eating pleasure and its links with dietary behaviors and health. *PLoS One* 15(12): e0244292.
- Dijker AJ (2019) Moderate eating with pleasure and without effort: Toward understanding the underlying psychological mechanisms. *Health Psychol Open* 6(2): 2055102919889883.
- Macaninch E, Buckner L, Amin P, Broadley I, Crocombe D, et al. (2020) Time for nutrition in medical education. *BMJ Nutr Prev Health* 3(1): 40-48.
- Saha P (2006) The superior doctor. *BMJ* 333(7571): 728.
- Mirmiran P, Bahadoran Z, Gaeini Z (2021) Common Limitations and Challenges of Dietary Clinical Trials for Translation into Clinical Practices. *Int J Endocrinol Metab* 19(3): e108170.
- Martínez-López E, Pérez-Guerrero EE, Torres-Carrillo NM, López-Quintero A, Betancourt-Núñez A, et al. (2022) Methodological Aspects in Randomized Clinical Trials of Nutritional Interventions. *Nutrients* 14(12): 2365.
- Peña-Jorquera H, Cid-Jofré V, Landaeta-Díaz L, Petermann-Rocha F, Martorell M, et al. (2023) Plant-Based Nutrition: Exploring Health Benefits for Atherosclerosis, Chronic Diseases, and Metabolic Syndrome—A Comprehensive Review. *Nutrients* 15(14): 3244.
- Salehin S, Rasmussen P, Mai S, Mushtaq M, Agarwal M, et al. (2023) Plant Based Diet and Its Effect on Cardiovascular Disease. *Int J Environ Res Public Health* 20(4): 3337.
- Koutentakis M, Surma S, Rogula S, Filipiak KJ, Gąsecka A (2023) The Effect of a Vegan Diet on the Cardiovascular System. *J Cardiovasc Dev Dis* 10(3): 94.
- Tucci M, Marino M, Martini D, Porrini M, Riso P, et al. (2022) Plant-Based Foods and Vascular Function: A Systematic Review of Dietary Intervention Trials in Older Subjects and Hypothesized Mechanisms of Action. *Nutrients* 14(13): 2615.
- Islam SU, Ahmed MB, Ahsan H, Lee YS (2021) Recent Molecular Mechanisms and Beneficial Effects of Phytochemicals and Plant-Based Whole Foods in Reducing LDL-C and Preventing Cardiovascular Disease. *Antioxidants (Basel)* 10(5): 784.

18. Mehta P, Tawfeeq S, Padte S, Sunasra R, Desai H, et al. (2023) Plant-based diet and its effect on coronary artery disease: A narrative review. *World J Clin Cases* 11(20): 4752-4762.
19. Bruns A, Greupner T, Nebl J, Hahn A (2024) Plant-based diets and cardiovascular risk factors: a comparison of flexitarians, vegans and omnivores in a cross-sectional study. *BMC Nutr* 10(1): 29.
20. Boden WE, O'Rourke RA, Teo KK, Hartigan PM, Maron DJ, et al. (2007) COURAGE Trial Research Group. Optimal medical therapy with or without PCI for stable coronary disease. *N Engl J Med* 356(15): 1503-1516.
21. Al-Lamee R, Thompson D, Dehbi HM, Sen S, Tang K, et al. (2018) ORBITA investigators. Percutaneous coronary intervention instable angina (ORBITA): a double-blind, randomized controlled trial. *Lancet* 391(10115): 31-40.
22. Maron DJ, Hochman JS, Reynolds HR, Bangalore S, O'Brien SM, et al. (2020) ISCHEMIA Research Group. Initial Invasive or Conservative Strategy for Stable Coronary Disease. *N Engl J Med* 382(15): 1395-1407.
23. Neufingerl N, Eilander A (2021) Nutrient Intake and Status in Adults Consuming Plant-Based Diets Compared to Meat-Eaters: A Systematic Review. *Nutrients* 14(1): 29.
24. Jedut P, Glibowski P, Skrzypek M (2023) Comparison of the Health Status of Vegetarians and Omnivores Based on Biochemical Blood Tests, Body Composition Analysis and Quality of Nutrition. *Nutrients* 15(13): 3038.
25. Selinger E, Neuenschwander M, Koller A, Gojda J, Kühn T, et al. (2023) Evidence of a vegan diet for health benefits and risks- an umbrella review meta-analyses of observational and clinical studies. *Critical Reviews in Food Science and Nutrition* 63(29): 9926-9936.