Jurnal Teknologi dan Inovasi Kesehatan

SAH PUBLISHER

Vol. 1, No. 1, September 2026

The Role of Plant-Based Dietary Patterns in Obesity Risk among Young Adults

Himmatunnisak Mahmudah[1*], **Ardy Wicaksono**[1], **Vivit Vidiasari**[2], **Yunita** [3], **Rani Rahmasari Tanuwijaya**[4]

[1]Universitas Sugeng Hartono, Indonesia

[2]Akbid Harapan Mulya Ponorogo, Indonesia

[3]Poltekkes Kemenkes Bengkulu, Indonesia

[4]Sekolah Tinggi Ilmu Kesehatan Pertamedika, Indonesia

**Corresponding author. Email: himmatunnisa.mahmudah@gmail.com*

Abstract. Obesity increasingly begins in young adulthood, a life stage in which dietary habits formed during the transition to independent living tend to persist and shape long-term cardiometabolic risk. Plant-based dietary patterns are widely promoted as a strategy for weight control, yet their effects depend strongly on the quality of the plant foods consumed. This article reviews the published literature on plant-based dietary patterns and obesity risk in young adults and interprets that literature against publicly available data from the World Health Organization, the Global Burden of Disease study, and the Indonesian national health surveys Riskesdas 2018 and Survei Kesehatan Indonesia 2023. The review defines plant-based patterns as a spectrum ranging from flexitarian eating to veganism and distinguishes healthful plant-based indices, built on whole grains, vegetables, fruits, legumes, and nuts, from unhealthful indices dominated by refined grains, sugar-sweetened beverages, and sweets. The synthesised evidence shows that healthful plant-based patterns are consistently associated with lower body mass index, slower weight gain, and lower risks of obesity related outcomes including type 2 diabetes and coronary heart disease, whereas unhealthful plant-based patterns show neutral or adverse associations. Plausible mechanisms include lower dietary energy density, higher fibre intake and satiety, and rapid diet induced shifts in the gut microbiota. The Indonesian context adds urgency, because adult obesity prevalence rose from 21.8 percent in 2018 to 23.4 percent in 2023 while ultra-processed foods and sedentary campus and office routines spread among young adults. The novelty of this review lies in joining the healthy versus unhealthy plant food distinction to the specific behavioural and food environment conditions of Indonesian young adults, and in deriving practical guidance that promotes plant rich eating without ignoring vitamin B12, protein adequacy, and disordered eating risks.

Keywords: plant-based diet; healthy plant-based diet index; obesity; young adults; Indonesia; dietary patterns

Received August 2026 / Revised September 2026 / Accepted September 2026

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INTRODUCTION

Obesity has become one of the defining public health problems of the twenty-first century, and its centre of gravity is shifting towards younger ages. The World Health Organization estimates that in 2022 one in eight people in the world was living with obesity, that 2.5 billion adults were overweight, and that 890 million of them were living

with obesity, corresponding to 43 percent of adults being overweight and 16 percent living with obesity [1]. A pooled analysis of 3,663 population based studies with 222 million participants confirmed that more than one billion people worldwide were living with obesity in 2022 and that adult obesity has more than doubled since 1990 in most countries [2]. Indonesia follows the same trajectory. The national basic health research survey Riskesdas recorded an adult obesity prevalence of 21.8 percent in 2018 [3], and the Indonesian Health Survey of 2023 recorded a further rise to 23.4 percent, alongside 14.3 percent of adults classified as overweight [4]. These Indonesian figures use the national obesity cutoff of a body mass index of 27 kg/m² or higher, so they are not directly interchangeable with estimates that apply the international cutoff of 30 kg/m², a distinction that matters whenever Indonesian statistics are compared with global ones [2], [4].

Diet is a central and modifiable driver of this epidemic. The Global Burden of Disease analysis of dietary risks in 195 countries estimated that suboptimal diet caused 11 million deaths and 255 million disability adjusted life years in 2017, with high sodium intake, low whole grain intake, and low fruit intake as the leading dietary risk factors [5]. Obesity itself is now understood as a chronic, relapsing, multifactorial disease of excess adiposity rather than a simple failure of willpower, involving neurohormonal, genetic, and environmental regulation of energy balance [6]. Body weight in early adulthood is particularly consequential. Excess adiposity gained between the ages of roughly 18 and 35 tracks strongly into later life, and the metabolic and psychosocial correlates of obesity, including insulin resistance, hypertension, and stigma, are already measurable in young adults [7]. Intervening at this stage therefore offers a long horizon of benefit, because dietary patterns adopted in young adulthood tend to persist.

The speed of dietary change in low and middle income countries makes the young adult window still more important. The nutrition transition framework describes how rising incomes, urbanisation, and globalised food markets shift populations from traditional diets towards patterns high in edible oils, sweeteners, refined grains, and animal products, accompanied by falling physical activity, and how these shifts now occur faster and at earlier stages of economic development than they did in high income countries [8]. A defining feature of the contemporary transition is the displacement of minimally processed foods by ultra-processed products, formulations of industrial ingredients that are energy dense, hyperpalatable, and aggressively marketed, whose rising sales track population weight gain across countries [9]. Controlled feeding evidence shows that this is not merely an association. In an inpatient crossover trial, adults offered an ultra-processed diet consumed about 508 kcal per day more than when offered an unprocessed diet matched for presented calories and macronutrients, and gained about 0.9 kg in two weeks, while losing weight on the unprocessed diet [10].

Young adults sit at the point where these forces converge. The transition out of the parental home, into higher education or first employment, reorganises eating around canteens, convenience outlets, food delivery applications, and irregular schedules, and weight related behaviours deteriorate measurably during this stage, which has been described as an overlooked age for weight related behaviour change [11]. Against this background, plant-based dietary patterns have attracted intense interest as a candidate response. The EAT-Lancet Commission concluded that a planetary health diet rich in vegetables, fruits, whole grains, legumes, and nuts, with modest amounts of animal foods, could feed ten billion people within environmental limits while reducing diet related

mortality [12]. Cohort evidence synthesised by Satija and Hu indicates that plant-based diets are associated with favourable weight and cardiometabolic profiles, provided that the plant foods emphasised are nutritionally high quality [13]. Public and clinical enthusiasm, however, often treats the label plant-based as a guarantee of healthfulness, which the evidence does not support.

This article therefore reviews the literature on plant-based dietary patterns and obesity risk with a deliberate focus on young adults and on the Indonesian setting. It pursues four aims. First, it clarifies what plant-based means by distinguishing dietary patterns and, within them, healthful and unhealthful plant food quality. Second, it summarises the mechanisms through which plant rich diets may influence energy balance. Third, it synthesises cohort, trial, and meta-analytic evidence on body weight, obesity, and related outcomes, attending to what is known specifically about younger adults. Fourth, it examines the Indonesian food environment, the risks that accompany poorly planned plant-based diets, and the practical guidance that follows for young adults, campuses, and primary care. The review is a literature review supplemented only by official public statistics, and it reports no new primary data.

METHODS

This study is a narrative literature review supplemented by publicly available aggregate data. No primary data were collected, no participants were recruited, and no new statistical analysis of individual level data was performed. The literature was identified through searches of the bibliographic record for work on plant-based dietary patterns, vegetarian and vegan diets, body weight, obesity, and young adults, and the review prioritised prospective cohort studies, randomised controlled trials, systematic reviews and meta-analyses, position papers of professional bodies, and analyses published by major international publishers. Preference was given to studies that quantified associations with effect estimates, to large cohorts with long follow-up such as the Nurses Health Studies, the Health Professionals Follow-Up Study, EPIC-Oxford, and the Adventist Health Study 2, and to syntheses that separated healthful from unhealthful plant-based patterns.

Public data were drawn exclusively from official or academically governed sources. Global figures were taken from the World Health Organization fact sheet on obesity and overweight [1], the NCD Risk Factor Collaboration pooled analysis published in The Lancet [2], and the Global Burden of Disease diet analysis [5]. Indonesian figures were taken from the Ministry of Health reports of Riskesdas 2018 [3] and the Indonesian Health Survey 2023 [4]. Where national and international obesity definitions differ, the cutoff used by each source is reported with the figure. Evidence was synthesised thematically across definitions, mechanisms, outcomes, population context, and risks, and the strength of each claim in the discussion is tied to the design of the underlying study, so that findings from trials, cohorts, and cross-sectional analyses are not presented as interchangeable.

RESULT AND DISCUSSION

1. Defining plant-based dietary patterns and the quality distinction

Plant-based is an umbrella term rather than a single diet, and much confusion in both research and public discussion comes from treating it as one exposure. At one end of the spectrum, flexitarian or semi-vegetarian patterns reduce meat without excluding it.

Pescetarian patterns exclude meat but retain fish, lacto-ovo vegetarian patterns exclude meat and fish but retain dairy products and eggs, and vegan patterns exclude all foods of animal origin [13], [14]. Position papers of the Academy of Nutrition and Dietetics conclude that appropriately planned vegetarian and vegan diets can be nutritionally adequate across the life cycle, which places the burden of the definition on planning and food choice rather than on the exclusion itself [14]. Long term cohort experience from EPIC-Oxford and the Adventist studies supports this framing, because vegetarians and vegans in those cohorts show lower average body mass index and lower prevalence of obesity than comparable meat eaters, with the gradient steepest for vegans [15].

Because categorical labels hide wide variation in what people actually eat, researchers at Harvard developed plant-based diet indices that score the quality of plant foods directly. In these indices, intakes of eighteen food groups are scored so that the overall plant-based diet index rewards plant foods and penalises animal foods without judging plant food quality, the healthful plant-based diet index additionally rewards whole grains, fruits, vegetables, legumes, nuts, vegetable oils, and tea or coffee while penalising refined grains, potatoes, fruit juices, sugar-sweetened beverages, and sweets, and the unhealthful plant-based diet index does the reverse, rewarding the less healthy plant foods [16], [17]. This three way distinction has proven decisive, because the healthful and unhealthful indices repeatedly point in opposite directions for cardiometabolic outcomes, a pattern reviewed comprehensively by Hemler and Hu, who argue that shifting populations towards high quality plant-based diets could reduce obesity, type 2 diabetes, and cardiovascular disease while lowering environmental burdens [18]. Fresán and Sabaté reach a parallel conclusion from the environmental side, showing that the progression from omnivorous to vegetarian and vegan diets lowers greenhouse gas emissions and resource use, so that health and sustainability incentives generally align, provided diet quality is maintained [19].

The practical meaning of the distinction is easy to illustrate. A young adult who replaces meat dishes with lentil soups, tempeh, tofu, vegetables, brown rice, and fruit follows a healthful plant-based pattern. A young adult who replaces the same dishes with instant noodles, white rice in large portions, sweetened iced tea, fried snacks, biscuits, and French fries also eats few animal products, yet follows an unhealthful pattern that is energy dense, low in fibre, and high in rapidly absorbed carbohydrate. Any review of plant-based diets and obesity that ignores this distinction will average together benefit and harm and conclude, misleadingly, that the label itself does nothing.

2. Plausible mechanisms linking plant-based patterns to body weight

Several mechanisms plausibly connect healthful plant-based patterns with lower energy intake and slower weight gain, and each is supported by experimental or prospective evidence. The best characterised is energy density. People tend to eat a fairly consistent weight of food from day to day, so diets built from water rich and fibre rich foods such as vegetables, fruits, legumes, and cooked whole grains deliver fewer calories per gram and allow satisfying portions at lower energy cost, whereas adding fat or removing water concentrates calories into smaller volumes [20]. Rolls summarised trials showing that lowering the energy density of the diet by adding water rich foods produced substantial weight loss even when participants were not instructed to restrict calories, which makes energy density a mechanism that operates without deliberate restraint [20].

Fibre acts through complementary pathways. Howarth and colleagues, reviewing controlled studies, found that increasing fibre intake by about 14 g per day under ad libitum conditions was associated with a roughly 10 percent reduction in energy intake and a body weight loss of about 1.9 kg over 3.8 months, with mechanisms including slower gastric emptying, increased chewing and meal duration, gel formation that blunts glucose absorption, and fermentation in the colon [21]. A later World Health Organization commissioned series of systematic reviews confirmed dose dependent benefits, finding that consuming 25 to 29 g of fibre per day was associated with 15 to 30 percent lower incidence of all cause mortality, coronary heart disease, type 2 diabetes, and colorectal cancer, alongside lower body weight and cholesterol than lower intakes [22]. Plant rich diets naturally package fibre with low energy density, so the two mechanisms reinforce each other in a way that isolated supplements do not reproduce.

The gut microbiota provides a third, faster acting pathway. In a controlled feeding study, David and colleagues showed that switching volunteers to an entirely plant-based or entirely animal-based diet altered the microbial community structure within days, with the animal-based diet increasing bile tolerant organisms and decreasing the bacteria that ferment plant polysaccharides [23]. Because microbial metabolites such as short chain fatty acids influence gut hormone release, appetite signalling, and energy harvest, these rapid shifts offer a plausible biological route through which sustained plant rich eating could modulate energy balance, although the causal contribution to human body weight remains an active research question rather than a settled fact [7]. Finally, healthful plant-based patterns displace the foods most strongly implicated in passive overconsumption, namely ultra-processed products high in fat, sugar, and salt [9], [10], and they are typically lower in saturated fat and higher in unsaturated fats, potassium, and magnesium, which supports insulin sensitivity and blood pressure control alongside weight effects [13], [18].

A further mechanism deserves emphasis because it is often overlooked in favour of nutrient based explanations: eating rate and meal structure. Foods that require chewing and arrive in large, water rich volumes slow the pace of a meal and allow satiety signals from the stomach and gut to register before large amounts of energy have been consumed, whereas soft, energy dense products can be eaten quickly and in large quantities before the same signals accumulate [20]. Whole plant foods sit at the favourable end of this spectrum almost by construction, since their fibre and water content cannot be removed without industrial processing, which is one reason why the distinction between whole and processed plant foods recurs throughout the outcome evidence. The same logic explains why liquid calories are so consistently problematic in young adult diets: sweetened beverages deliver energy with almost no chewing, no gastric distension, and no fibre, so they add to total intake without displacing other foods, and they are penalised in the healthful plant-based index precisely because a diet can be simultaneously plant derived and obesogenic when its plant foods arrive in refined and liquid forms [16], [17].

3. Evidence from cohorts and trials on weight and obesity risk

Prospective cohort studies using the plant-based diet indices provide the most direct evidence on long term weight trajectories. In three United States cohorts followed with repeated dietary assessments, Satija and colleagues found that changes in plant-based diet quality predicted weight change over four year intervals in opposite directions depending on quality: increases in the healthful plant-based diet index were associated with significantly less weight gain, whereas increases in the unhealthful index were associated

with greater weight gain [24]. The same research programme had earlier shown that a healthful plant-based pattern was associated with substantially lower risk of type 2 diabetes, with a hazard ratio of 0.66 for the healthful index, while the unhealthful index was associated with higher risk, with a hazard ratio of 1.16 [16]. For coronary heart disease, the healthful index was associated with lower risk, hazard ratio 0.75, and the unhealthful index with higher risk, hazard ratio 1.32 [17]. A meta-analysis of twelve prospective studies by Qian and colleagues confirmed the diabetes finding across populations, reporting a relative risk of 0.77 for plant-based dietary patterns overall and 0.70 when only healthy plant-based patterns were considered [25]. Because obesity and type 2 diabetes share dietary drivers, this coherent pattern across outcomes strengthens the inference that plant food quality, not plant food quantity alone, is the operative exposure.

Categorical comparisons of vegetarians and meat eaters show the same gradient from a different angle. In the Adventist Health Study 2, Tonstad and colleagues reported mean body mass index rising stepwise across dietary categories, from 23.6 kg/m² in vegans through 25.7 in lacto-ovo vegetarians, 26.3 in pescetarians, and 27.3 in semi-vegetarians to 28.8 kg/m² in non-vegetarians [26]. In EPIC-Oxford, Rosell and colleagues followed weight change over five years and found that participants in all dietary groups gained weight, roughly 400 g per year on average, but vegans gained the least, with fish eaters and vegetarians intermediate [27]. These are observational contrasts and remain vulnerable to confounding by the health conscious behaviour that accompanies vegetarian identity, a caveat emphasised in critical appraisals of the field [28]. Even so, the consistency of the gradient across two continents and several designs is difficult to attribute to confounding alone.

Randomised trials, though shorter and usually conducted in adults with overweight or diabetes rather than in young adults specifically, test whether adopting a plant-based diet causes weight loss. A meta-analysis of fifteen randomised controlled trials by Huang and colleagues found that vegetarian diets produced significantly greater weight loss than non-vegetarian diets, by about 2.02 kg overall, with vegan diets producing a larger difference of about 2.52 kg [29]. In a randomised trial among adults with overweight, Turner-McGrievy and colleagues found that participants assigned to a vegan diet lost about 7.5 percent of body weight over six months, compared with about 3.1 percent among omnivore controls, with plant-based groups generally outperforming omnivorous comparison diets [30]. Kahleova and colleagues randomised adults with type 2 diabetes to a vegetarian or conventional diabetic diet and observed greater weight loss in the vegetarian group, about 6.2 kg against 3.2 kg, together with greater reductions in thigh adipose tissue [31]. In an earlier trial, Barnard and colleagues compared a low fat vegan diet with a conventional diabetes diet and found weight reductions of 4.4 kg and 3.0 kg respectively, a difference that favoured the vegan diet without reaching statistical significance, which usefully tempers expectations about effect size [32]. Taken together, the trials indicate modest but real short term advantages for plant-based interventions, typically two to four kilograms beyond comparison diets over six months, with adherence the dominant determinant of individual results [29], [28].

Three interpretive cautions follow. First, most trials enrol middle aged participants, so their quantitative results cannot be transferred mechanically to young adults, whose baseline weight, metabolic rate, and adherence environment differ; the direction of effect is likely shared, but magnitudes are not established for this age group. Second, benefits shrink when plant-based interventions rely on refined starches and added fats, exactly as

the index studies predict [17], [24]. Third, publication enthusiasm for plant-based diets can inflate expectations; the umbrella review by Dinu and colleagues, covering meta-analyses of observational studies, found favourable associations between vegetarian diets and several cardiometabolic risk factors but rated much of the underlying evidence as limited by design, which argues for confident communication about direction and humility about precision [28].

It is also instructive to place plant-based patterns alongside the other dietary patterns with strong trial pedigrees, the Mediterranean diet and the Dietary Approaches to Stop Hypertension pattern, because the comparison clarifies what is distinctive and what is shared. All three patterns are built on a common core of vegetables, fruits, legumes, whole grains, nuts, and unsaturated oils, and the EAT-Lancet reference diet was explicitly constructed to be compatible with these established healthy patterns while adding environmental constraints [12]. The Mediterranean pattern retains olive oil as its principal fat and includes fish and moderate dairy, while the DASH pattern retains low fat dairy and lean animal foods, so neither requires the exclusion decisions that define vegetarian categories. Reviews of plant-based diets note that cardiometabolic benefits rise with the proportion of energy drawn from the shared whole plant core, which suggests that much of the benefit attributed to plant-based eating is available to young adults through Mediterranean or DASH style eating as well [13], [18]. The distinctive contribution of explicitly plant-based patterns is therefore not a unique physiology but a forcing device: they make the whole plant core the default rather than an accompaniment, and they align dietary advice with the environmental case that increasingly motivates young consumers. For obesity prevention, the practical implication is reassuring, because services can offer a family of plant forward patterns and let cultural fit and preference determine which one an individual sustains.

4. Young adults as a distinct exposure window

Young adulthood, roughly the decade from 18 to the early thirties, is when trajectories of body weight are set and when the environment of eating changes most abruptly. Nelson and colleagues documented that diet quality falls, fast food and sugar-sweetened beverage consumption rises, physical activity declines, and weight increases during emerging adulthood, driven by leaving home, food marketing aimed at the young, irregular work and study schedules, and the new autonomy of food purchasing [11]. University students face canteen menus dominated by fried foods and sweetened drinks, long sedentary hours in lectures and in front of screens, and sleep patterns that shift appetite regulation. Young workers face analogous pressures through desk based jobs, commuting, and reliance on food delivery platforms that default to energy dense options. Food habits research consistently shows that patterns consolidated in this window, whether favourable or adverse, persist into middle age, which is why reviews of obesity pathogenesis stress early adulthood as a high leverage period for prevention [6], [7].

Direct evidence on plant-based diets in young adults is thinner than in older populations, and this review does not pretend otherwise. The cohort and trial findings summarised above derive mainly from adults across wider age ranges, and the young adult specific literature is dominated by campus based cross-sectional surveys and short interventions rather than long prospective studies. What can be said with confidence is narrower but still useful: the mechanisms that favour healthful plant-based patterns, namely low energy density, high fibre, and displacement of ultra-processed foods, operate independently of age [20], [21], [22]; the dietary risks concentrated in young adult life, namely sweetened

beverages, fried snacks, instant noodles, and large portions of refined staples, are precisely the foods that an unhealthful plant-based index rewards and a healthful index penalises [16], [17]; and the life stage offers institutional settings, universities and first employers, through which healthier defaults can be delivered at scale [11]. The honest conclusion is that plant-based guidance for young adults rests on strong mechanistic and general adult evidence, applied to a life stage whose specific long term trials remain to be done.

Two further features of young adult life amplify dietary risk and are worth naming because dietary guidance that ignores them tends to fail. The first is sleep and schedule disruption: late night study, shift work, and socialising compress sleep and push eating into the night, when available foods are disproportionately energy dense convenience products, and restricted sleep is consistently followed by higher next day energy intake. The second is the digital food environment: delivery applications, social media food marketing, and influencer promoted eating content reach young adults continuously and are engineered to trigger orders at moments of fatigue and boredom, an exposure that reviews of emerging adulthood identify as a structural feature of this life stage rather than a failure of individual discipline [11]. Both features strengthen the case for environmental and institutional responses over purely educational ones, and both are directly relevant to Indonesian campuses and workplaces, where food delivery use among the young is high and canteen provision is often the only counterweight. They also explain why plant-based eating, when adopted by young adults as an identity supported by peers and made visible in campus food outlets, may persist better than private dieting resolutions: the pattern recruits the same social and digital channels that otherwise market energy dense food [7], [11].

5. The Indonesian young adult context

Indonesia illustrates the global pattern in an acute form. Adult obesity prevalence rose from 21.8 percent in Riskesdas 2018 to 23.4 percent in the Indonesian Health Survey 2023, with a further 14.3 percent of adults overweight, so more than one in three Indonesian adults now carries excess weight by national criteria [4], [3]. Because Indonesian statistics apply a body mass index cutoff of 27 kg/m² for obesity while the World Health Organization and the NCD Risk Factor Collaboration apply 30 kg/m², global estimates for Indonesia, around 11.5 percent for 2022 on the international definition, look lower without implying lower risk, since cardiometabolic complications in Asian populations arise at lower body mass index values [2], [4]. The direction of travel is unambiguous on either definition, and the rise is fastest in urban areas where young adults concentrate for study and work [8].

The traditional Indonesian diet offers unusually strong raw material for a healthful plant-based pattern. Soy foods such as tempeh and tofu are inexpensive, widely accepted, and protein dense; legumes, peanuts, and a wide repertoire of vegetables appear in dishes such as gado gado, pecel, sayur lodeh, and urap; and rice based meals are readily rebalanced towards vegetables and plant protein. The problem is not the traditional repertoire but the layer added on top of it by the nutrition transition: sweetened teas and coffees, instant noodles eaten as a meal in themselves, fried snacks sold at every campus gate, and delivery platform promotions that bundle rice, fried chicken, and sugary drinks at prices below the cost of a vegetable rich meal [8], [9]. Sedentary routines complete the picture, as lectures, screen based assignments, and office work compress physical activity into an optional extra that crowded schedules discard. Young adults therefore face a food

environment in which the unhealthful version of plant-based eating is cheap and ubiquitous, deep fried, refined, and sweetened, while the healthful version requires deliberate choice against the default. This asymmetry, rather than any lack of suitable local foods, is the central obstacle that guidance and policy must address [9], [11].

6. Risks and limitations of plant-based eating in young adults

Enthusiasm for plant-based diets must be balanced against three documented risks, each manageable and each dangerous if ignored. The first is vitamin B12. Because B12 is produced by microorganisms and reaches humans mainly through animal foods and supplements, unsupplemented vegan diets carry a real deficiency risk; Pawlak and colleagues, reviewing studies of vegetarians, found reported deficiency prevalence varying widely across studies and highest among vegans who did not use supplements, with consequences that include megaloblastic anaemia and potentially irreversible neurological injury [33]. The Academy of Nutrition and Dietetics position is that B12 fortified foods or supplements are a routine necessity for vegans, not an optional refinement [14]. Young adults adopting vegan diets through social media guidance are the group least likely to receive this message, which makes explicit counselling essential.

The second risk is protein adequacy, more often a matter of distribution and quality than of total intake. Plant proteins are individually lower in one or more essential amino acids and less digestible than animal proteins, but varied diets combining legumes, soy foods, grains, nuts, and seeds across the day meet requirements for sedentary and recreationally active adults without special products [14], [34]. Lynch and colleagues, reviewing plant-based diets in relation to exercise performance, concluded that such diets do not disadvantage strength or endurance performance when total energy and protein are adequate, which is reassuring for active young adults, while noting that athletes with high energy demands must plan intake deliberately [34]. In the Indonesian context, tempeh and tofu make adequacy straightforward and inexpensive, provided they are not displaced by the refined starch and fried snack pattern described earlier.

The third risk is psychological. Restrictive eating identities can serve as a socially acceptable vehicle for disordered eating in vulnerable individuals. Bardone-Cone and colleagues compared women with a history of eating disorders with controls and found that those with an eating disorder history were far more likely to have been vegetarian, 52 percent against 12 percent, more likely to report weight control as their primary motivation, and most likely to say that vegetarianism began after the eating disorder and was related to it [35]. The finding does not indict vegetarian diets, which most adherents follow for ethical, environmental, or health reasons unrelated to weight, but it does mean that clinicians, campus counsellors, and dietitians should ask about motivation when a young adult adopts a restrictive pattern, and should treat rapid adoption driven by weight anxiety as a prompt for sensitive screening rather than uncomplicated encouragement [35]. Kahleova and colleagues add a practical observation from intervention research: plant-based diets prescribed with structure, group support, and attention to satiety produce weight loss without the hunger that typically triggers disordered restriction, which suggests that how the diet is introduced matters as much as its composition [36].

7. Practical dietary guidance and policy implications

The evidence supports guidance that is specific about food quality and modest about promises. For young adults, the core recommendation is to build meals around whole plant foods: vegetables in at least two meals daily, legumes or soy foods as the default

protein, whole or minimally refined grains where available, fruits in place of sweetened snacks, and water in place of sugar-sweetened beverages, while treating refined grains, fried snacks, sweets, and sweet drinks as occasional foods whether or not they contain animal ingredients [13], [18], [16]. Animal foods need not be eliminated for benefit to occur; the index evidence rewards graded shifts, so a flexitarian pattern that replaces several meat centred meals each week with tempeh, tofu, legume, and vegetable dishes captures much of the association at far lower social and nutritional risk than an abrupt unsupplemented vegan conversion [18], [19], [24]. Those who choose full vegetarian or vegan patterns should add a vitamin B12 supplement or fortified foods as a standing rule, attend to protein variety, and seek dietetic review if weight falls unintentionally or eating becomes a source of distress [14], [33], [35].

Institutions can shift the defaults that individual advice struggles against. University canteens and workplace cafeterias can price vegetable and legume dishes below fried and sweetened alternatives, make water the default drink, and place plant rich options at the start of the serving line, measures that exploit the same environmental logic through which ultra-processed marketing currently operates in reverse [9], [11]. Campus health services can integrate brief dietary counselling and B12 advice into the services students already use, and can screen for disordered eating when restrictive diets are adopted suddenly [35]. Public policy has parallel levers in front of pack labelling, marketing rules for products aimed at the young, and fiscal measures on sugar-sweetened beverages, all consistent with the World Health Organization framing of obesity as an environmental and commercial problem as much as a clinical one [1]. None of these measures requires young adults to adopt a vegetarian identity; all of them make the healthful version of plant rich eating the easier choice, which is precisely the condition under which population dietary patterns actually change [8], [12].

CONCLUSION

The literature supports a clear and qualified answer to the question posed by this review: plant-based dietary patterns are associated with lower obesity risk in young adults when the patterns are built from whole, minimally processed plant foods, and they confer no such protection, and may add risk, when they are built from refined grains, fried snacks, sweets, and sugar-sweetened beverages, so the operative variable is plant food quality rather than the plant-based label itself. The mechanisms of low energy density, high fibre intake, satiety, and rapid microbiota response are experimentally plausible, the prospective and trial evidence is directionally consistent across cohorts, meta-analyses, and randomised studies, and the Indonesian data, showing adult obesity rising from 21.8 percent in 2018 to 23.4 percent in 2023 amid rapid ultra-processed food expansion, give the conclusion local urgency. For Indonesian young adults the practical task is not to import an unfamiliar diet but to defend and modernise an existing one, keeping tempeh, tofu, legumes, and vegetables at the centre of campus and working life while pushing back the fried, refined, and sweetened layer that the nutrition transition has added, with vitamin B12 supplementation, protein variety, and attention to eating disorder risk as standing safeguards. Future research should test these propositions directly in young adult cohorts and campus interventions in Southeast Asia, where the long term evidence is still thin, so that guidance for the age group in which obesity trajectories are set can rest on data from that group itself.

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