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THEMATIC PAPER

Good for the planet and good for our health: the evidence for whole-food plant-based diets

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There is growing interest in the health and environmental benefits of whole-food plant-based (WFPB) diets. The current global food system is harmful to our planet and is a key driver of climate change, pollution and biodiversity loss. A transition to WFPB diets will mitigate against these impacts and potentially reduce greenhouse gas emissions by up to 80%. Emerging evidence suggests that such diets also have significant physical and mental health benefits and can be useful in preventing and treating a range of conditions. Psychiatrists therefore have an important role to play in promoting WFPB diets among patients.

A whole-food plant-based (WFPB) diet is a diet that consists mainly or entirely of vegetables, whole grains, legumes, fruits, nuts and seeds, and contains little or no foods derived from animals. Over the past decade, interest in WFPB diets has grown, with increasing evidence to suggest that these diets are beneficial to both our health and the environment.[1] Dietary patterns that move closer to WFPB diets, such as increased fruit and vegetable intake and the Mediterranean diet, appear to have similar benefits.

Our diet, along with the food system that supports it, is having deleterious effects on our environment at local and planetary levels, making this a topic of international importance.[2] Globally, the food system is a key contributor to climate change, land-system change, chemical pollution of air and water, biodiversity loss, freshwater use, and nitrogen and phosphorus cycles[2]. Food production accounts for approximately 26% of anthropomorphic greenhouse gas emissions, 70% of freshwater use, 40% of arable land use, 32% of acidification and 78% of eutrophication (over-enrichment of bodies of water with minerals and nutrients).[3]

These environmental impacts are not equally created across the production of all food groups or types. Evidence shows a gradient where, with minimal exception, meat from ruminant animals (cows, goats, sheep) is responsible for the highest negative impact on the environment; pork, poultry, dairy, eggs and non-trawling fisheries have an intermediate impact; and plant-based foods have the lowest levels of environmental impact.[3] Considering greenhouse gas emissions alone, the contribution of livestock is disproportionate to their value to the food system: livestock contribute 56–58% of agriculture's greenhouse gas emissions and provide 37% of protein and 18% of calories.[4] Looking at impacts on the climate alone, dairy, meat and eggs account for 83% of greenhouse gas emissions in the average European diet, with only 17% from plant-based foods.[5]

Adaptation and improvements to production methods can reduce these impacts, but without changes in dietary patterns, improved farming methods on their own are not enough to create a sustainable food system.[6] Mitigation techniques at the point of production could reduce greenhouse gas emissions by approximately 10% by 2050, but a shift of dietary patterns, with increased consumption of plant-based foods, could reduce greenhouse gas emissions by up to 80%.[2]

Health benefits of WFPB diets

Mental health

In addition to the environmental benefits, there is mounting evidence that WFPB diets (and related dietary patterns) are likely to reduce the risk of developing common symptoms of mental ill health, such as depressive symptoms. Emerging evidence suggests that such diets can be a useful intervention for those suffering with common mental health conditions. Longitudinal data from the UK[7] and Australia[8] show that people who eat more fruits and vegetables are more likely to have better measures of mental well-being and happiness. These studies suggest a dose–response relationship: the Australian study suggests that an increase of eight portions a day of fruit and vegetables is equivalent to the same psychological gain as people experience when moving from unemployment to employment.[8] Similarly, a systematic review and meta-analysis of observational studies exploring relationships between healthy dietary indices and the risk of developing depressive symptoms found the strongest association for the Mediterranean diet, with a relative risk of highest versus lowest adherence to the diet of 0.67 (95% CI 0.55–0.82).[9] Further analysis of the data revealed evidence that five food types (fruits, vegetables, legumes/pulses, cereals/wholegrains and fish) reduced the risk of developing depressive symptoms and two food types (meat and dairy) increased it.[9] The beneficial effect of plant foods on mood is likely to occur quickly,

but 7–8 portions a day are likely needed for the most meaningful response.[8]

Interventional studies also show promising results. A large multicentred, multi-ethnic workplace-based RCT found that people who ate a vegan diet (a diet that excludes all animal products, including dairy) reported improvements in measures of depression, anxiety, fatigue, well-being and general health.[10] They also reported increased satisfaction with their diets. Other trials have found that increasing fruit and vegetable consumption increases measures of mental well-being, and secondary outcome measures of studies investigating the effects of a WFPB vegan diet on diabetes and obesity found improvements on measures such as mental well-being. A synthesis of the evidence base for dietary recommendations for the prevention of depression has been published,[11] which includes:

(a) following 'traditional' dietary patterns, such as the Mediterranean diet
(b) increasing consumption of fruits, vegetables, legumes, wholegrains, nuts and seeds
(c) ensuring a high consumption of food rich in omega-3 polyunsaturated fatty acids
(d) replacing unhealthy food with wholesome nutritious food
(e) limiting intake of processed foods, fast foods, commercial bakery goods and sweets.

The evidence base for using diet as an intervention for people with depression is less robust but is emerging. One study, involving 500 people with chronic moderate to severe depression and anxiety, reported that a WFPB vegan diet plus exercise, mindfulness and environmental changes improved self-reported symptoms at the end of the intervention period (12 weeks) and at 6-month follow-up.[12] Similarly, the SMILES RCT found that for people with a depressive disorder who consumed unhealthy diets, eating a diet similar to a Mediterranean diet, high in unprocessed plant-based food, led to a significant reduction in scores on the Montgomery-Åsberg Depression Rating Scale, compared with controls who did not change their diet.[13] Indeed, the number needed to treat (NNT) was 4.1, which is lower than that typically seen for selective serotonin reuptake inhibitors (SSRIs), where the NNT is around 7. Although further research is needed to confirm these preliminary findings, the results are already consistent with the more robust data on reducing risk of developing depressive symptoms in the population not currently suffering any mental ill health.

Physical health

Importantly, moving towards a WFPB diet also supports improved physical health and could help to address some of the physical health inequalities experienced by people with mental disorders. People with severe mental illness (SMI) have a reduced life expectancy (by between 15 and 20 years) compared with the general population.[14] Two-thirds of these premature deaths are from preventable physical health conditions, such as cardiovascular disease and cancer, many of which are related to obesity and poor diet.[14]

A variety of studies indicate that WFPB diets (and similar dietary patterns) play a valuable role in preventing and managing obesity, type 2 diabetes and cardiovascular disease, and in reducing overall and cardiovascular mortality. Plant-based diets are associated with a lower prevalence and incidence of type 2 diabetes.[15] In those who already have the disease, plant-based diets can improve glycaemic control and reduce the risk of complications.[15] As a result, the American Association of Clinical Endocrinologists and American College of Endocrinology recommend adoption of a plant-based diet for individuals with type 2 diabetes. Studies also demonstrate that WFPB diets can be a successful intervention for promoting weight loss and subsequently reducing the risk of chronic disease. In one RCT, participants following a WFPB diet had significant improvements in their body mass index (BMI) compared with the control group at 6 months (mean BMI reduction of 4.4, compared with 0.4).[16] More recently, large-scale observational studies have reported an association between plant-based diets and a lower risk and severity of COVID-19 disease.[17] It is important to note that although healthy WFPB diets are associated with a reduced risk of disease, 'unhealthy' plant-based diets, with more processed and sweetened foods, have been associated with an increased risk of disease. It is therefore essential that the shift towards a plant-based approach is done in a healthy manner.

Conclusions

We have clear evidence that human-induced climate change, air and water pollution and biodiversity loss are already affecting every region of the globe. This situation is expected to worsen if swift action is not taken at an individual, organisational and national level. A widespread shift to WFPB diets has the potential to significantly mitigate against further environmental damage, limit global temperature rises and reduce the risk of climate-induced disasters. Importantly, these diets are not only good for the planet; they are also good for our physical and mental health. Thus, a move to a WFPB diet is a simple, effective and immediate change that anyone can make to improve their own health and that of the planet. The evidence base for making these changes is strong enough to be found in international guidelines for both health and environmental sustainability. Psychiatrists must embrace this important shift in our understanding of diet and start to include WFPB dietary advice when formulating a biopsychosocial care plan.

Data availability

Data availability is not applicable to this article as no new data were created or analysed in this study.

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Author contributions

All four authors contributed to the conception and design of the paper, to drafting and editing the work, and to approving the final version.

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Declaration of interest

None.

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