

EAT2beNICE Project: The correlation between diet and mental health

 openaccessgovernment.org

30 March 2023

Jeanette C. Mostert & Alejandro Arias Vasquez from the Departments of Genetics and Psychiatry, Radboud University Medical Center Nijmegen, The Netherlands, reveal that diet and mental health are linked, as they reflect on the lessons learned from the Eat2beNICE project

We all know the saying, “you are what you eat”. The food we eat provides the building blocks for our bodies, directly linking our diet and mental health. Healthy eating is, therefore, essential for our physical and mental wellbeing.

During the past five years, the Horizon2020-funded project “Effects of Nutrition and Lifestyle on Impulsive, Compulsive, and Externalizing behaviours – Eat2beNICE” (No 728018) sought to unravel the biological mechanisms that link diet and mental health. This article shares the main lessons we learned from this endeavour.

1. Diet & its influence on mental health

Population studies, observational data and clinical trials all point in the same direction: mental health can be (positively and negatively) influenced by dietary behaviour. In other words, diets rich in “unhealthy” items (i.e. sugar, fat, alcohol, processed foods etc.) do not cause mental illness but contribute to increased risk and worse outcomes. Inversely, diets rich in “healthy” items (i.e. fibre, fruits & vegetables, etc.) can constitute protective factors, improve (behavioural) outcomes and even reduce medication use.

From large population and twin studies, we now know that an “unhealthy” diet is associated with attention deficit hyperactivity disorder (ADHD) symptoms ⁽¹⁾, stress and neuroticism ⁽²⁾. Even more striking, our findings indicate that an unhealthy diet during pregnancy, such as drinking sweetened carbonated beverages, is negatively associated with ADHD in offspring. ⁽³⁾ At the same time, a high fibre intake and breastfeeding may reduce ADHD risk.

These small but significant associations in population cohorts warrant further investigation into diet and mental health in clinical trials. The PREDIMED-Plus and TRACE trials both have shown that changing to a “healthy” diet can benefit mental health. The PREDIMED-Plus energy-restricted Mediterranean diet resulted in weight loss and lower impulsivity in a group of elderly, overweight individuals, compared to the control group that did not receive this intervention. ⁽⁴⁾ In the TRACE-trial ⁽⁵⁾, 51% of children with ADHD that adopted a healthy diet according to the Dutch national dietary guidelines, showed a decline in ADHD symptoms after five weeks.

The evidence linking diet and mental health is accumulating rapidly. It is, therefore, urgent to further elucidate the causal and potential therapeutic role of diet for mental health. For this, more clinical trials are needed that are adequately powered and have an active control group. Such trials require significant investments of both time and money.

2. There are no superfoods for mental health

What exactly is a healthy diet? In other words, is there something we should all eat to improve our mental health? Unfortunately, the answer to this question is not so simple. Common recommendations, including those of the [World Health Organization \(WHO\)](#), include eating plenty of fruits, vegetables and whole grain products and choosing foods that are lower in saturated fat, salt and sugar. The Mediterranean diet contains similar recommendations but emphasises extra-virgin olive oil, moderate amounts of fish and poultry, and low amounts of dairy products. Furthermore, healthy diets should accompany other lifestyle modifications, such as sufficient sleep, exercise and social interaction.

In short, there is no good evidence (yet), of the existence of superfoods for mental health. While healthy dietary habits contribute to better mental health, these are no replacement for current clinical guidelines for treatment. Combining a healthy diet with standard clinical treatment can significantly improve treatment outcomes and reduce medication use, as shown in the TRACE trial.

3. Behavioural modification is challenging, especially in the context of impulsivity

The above lifestyle recommendations often require substantial changes in behaviour and habits that must be maintained for a long time. It requires much self-control and motivation to ignore all the easy-access junk food around us, cook a wholesome meal, and go for a daily long walk. For people who are highly impulsive and struggle with self-control, such as individuals with ADHD, this is extra challenging.

In Eat2beNICE, we have shown that dietary interventions are less effective for individuals with high impulsivity.⁽⁶⁾ Therefore, treating impulsivity first before starting a weight loss or dietary program may be more effective for these individuals. This constitutes a potential paradigm shift in the treatment approach for both mental and somatic (i.e. obesity/overweight-related) problems.

One of the objectives of Eat2beNICE was to translate scientific findings into easily understandable and accessible information and provide the general public with hands-on solutions to improve their dietary habits. For this purpose, we collaborated closely with the patient organisation [ADHD Europe](#) to investigate the needs of individuals with ADHD. This resulted in an [online cookbook](#) that contains recipes and tips for healthy eating, especially targeting individuals and families with ADHD.⁽⁷⁾

4. Gut microbiota are an essential player in linking diet and mental health

An important question that still needs answering is how food influences the brain. One prime candidate for this interaction are the micro-organisms that live in our gut, known as the gut microbiota. Individuals with ADHD have a different gut microbiota composition than unaffected individuals ⁽⁸⁾, and animal studies have shown that eating junk food affects gut microbiota, metabolism, inflammation and behaviour. ⁽⁹⁾ To better understand these biological pathways, we need to do more functional studies that characterise how diet affects microbiota composition and functioning.

5. Personalised interventions for a healthy society

Personalised health and lifestyle interventions that consider our biological makeup, cognitive flexibility and dietary preferences will soon be the new reality. Eat2beNICE results are clear examples of the different avenues we can take to tailor the most effective treatment approaches for behavioural, psychiatric and neurodevelopmental disorders. Furthermore, such scientific knowledge can help other (i.e. clinical, industrial, societal) parties to turn personalised health innovations into applications and products, taking into account consumer engagement, nutrition behaviour and patient needs. By helping citizens to make appropriate and feasible lifestyle changes, a healthy society can become a reality.

References

1. Li et al. 2020. Am.J.Med.Gen.Part B: Neuropsychiatric Genetics.
<https://doi.org/10.1002/ajmg.b.32825>
2. Schveren et al. 2021. Clinical Nutrition.
<https://doi.org/10.1016/j.clnu.2020.06.016>
3. Kvalvik et al. 2022. Eur. J. Nutr.
<https://doi.org/10.1007/s00394-022-02798-y>
4. Mallorquí-Bagué et al. 2021. Scientific Reports.
<https://doi.org/10.1038/s41598-021-88298-1>
5. Bosch et al. 2020. BMC Psychiatry.
<https://doi.org/10.1186/s12888-020-02576-2>
6. Testa et al. 2022. J. Clinical Medicine.
<https://doi.org/10.3390/jcm11123476>
7. New Brain Nutrition online cookbook
<https://newbrainnutrition.com/online-cook-book/>
8. Gkougka et al. 2022. Pediatric research.
<https://doi.org/10.1038/s41390-022-02027-6>
9. Veniaminova et al. 2020. Front. Neurosci.
<https://doi.org/10.3389/fnins.2020.00024>

Please Note: This is a Commercial Profile



This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

