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2022

### Effects of Mediterranean and Western Dietary Patterns on Mental Distress and Perceived Stress

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#### Recommended Citation

Nagorny, Katerina; Chowdhury, Ushima; Rosenberg, Lexis; Welch, Megan; Dempsey, Gerard; and Colabelli, Michael, "Effects of Mediterranean and Western Dietary Patterns on Mental Distress and Perceived Stress" (2022). *Research Days Posters 2022*. 82.

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## Abstract

Compared to the Western diet, the Mediterranean diet has many known health benefits. To assess how the dietary components of each diet affect mental wellbeing, an anonymous online survey targeting those 18 and older was distributed via social media and email. This survey included demographic questions and the validated Food-Mood Questionnaire, which asked participants to rate how often they consumed various food groups that constitute both diets, such as whole grains, fish, fast food, and meat. It also included questions that evaluated their perceived stress and mental distress through the Perceived Stress and the Kessler-6 scales, respectively. A total of 1591 participants completed the survey. The data was analyzed using Spearman's Rho correlation and Principal Component Analysis in SPSS version 25.0. The results showed significant negative correlations between mental distress and perceived stress with several components of the Mediterranean diet, such as whole grains, seafood, and beans. Meat was also found to be negatively correlated with mental distress and perceived stress. However, significant positive correlations between mental distress, perceived stress and the Western diet such as fast food and high glycemic index food were found. This suggests that incorporating components of the Mediterranean diet is beneficial for mental wellbeing.

## Introduction

- The Mediterranean diet is primarily composed of fruits and vegetables, whole grains, seafood, and legumes, while the Western diet mainly consists of fast food, refined grains, and other processed foods (Mayo Clinic, 2021; Statovci et al., 2017).
- Previous studies have found that the Mediterranean diet is correlated with lower rates of depression and anxiety, such that nuts and legumes are associated with reduced anxiety and stress, and better mental health. Similarly, higher fruit and vegetable consumption are associated with more positive emotions and happiness (Parletta et al., 2017).
- Consuming green leafy vegetables has also been found to have a protective effect against clinical symptoms of depression (Ribeiro et al., 2017).
- Inadequate consumption of fruits and vegetables is significantly associated with an increased risk of depressive symptoms. Studies have also found that consuming fruits or vegetables at least once a day is associated with a lower risk of developing symptoms of both depression and anxiety (Liu et al., 2020).
- An ultra-processed diet consisting of fried food, processed meat, refined grains, and high-fat dairy products is associated with higher odds of depressive symptoms (Adjibade et al., 2019).
- Fast-food contributes to the activation of inflammatory pathways, which leads to the accumulation of oxidative stress and increases the risk for depression (Lahouti et al., 2021; Xu et al., 2020).
- Notably, there have been few studies that have investigated the individual components of each dietary pattern and how they can affect both mental distress and perceived stress.
- Our study aims to address this gap by investigating how components of the Mediterranean and Western diets affect mental distress and perceived stress in adults.

## Methods

- An anonymous online survey targeting adults 18 years and older was distributed via social media platforms and emails.
- The survey was comprised of three validated scales: the Food-Mood Questionnaire, Kessler-6 Scale, and the Perceived Stress Scale. These scales evaluated participants' consumption of various foods that constitute both diets, and evaluated their perceived stress and mental distress.
- Over 1600 participants completed the survey, however only 1591 participants were included in the data set.
- Spearman's Rho correlation and Principal Component Analysis in SPSS version 25.0 were used to analyze the data.

## Results

The results suggest that the Mediterranean dietary components had significant negative correlations with mental distress and perceived stress. Significant positive correlations were found between Western dietary components, and mental distress and perceived stress.

**Table I. Spearman's Rho Correlations For Dietary Components and Mental Distress and Perceived Stress**

	Mental Distress	Perceived Stress
Whole Grains	-0.094**	-0.073**
Beans	-0.070**	-0.090**
Fish	-0.133**	-0.111**
Vegetables	-0.117**	-0.120**
Flaxseeds/ Nuts	-0.119**	-.106**
Beef/Lamb	-0.085**	—
Chicken/Turkey	-0.065**	—
Fast Food	0.205**	0.186**
High Glycemic	0.055*	0.051*
Yogurt	-0.073**	—

**Table II. Principal Component Analysis of Dietary Factors, Perceived Stress, and Mental Distress**

	Western Diet	Mediterranean Diet
Perceived Stress	0.945	—
Mental Distress	0.938	—
Depressed	0.787	-0.102
Weekly Whole Grains	—	0.528
Weekly Beans	—	0.306
Fish Consumption	—	0.517
Weekly Vegetables	—	0.563
Weekly Flaxseed/ Nuts	—	0.542
Yogurt Consumption	—	0.433
Weekly Chicken/Turkey	—	0.259
Beef/Lamb Consumption	—	0.248
Weekly Rice/Pasta	—	0.155
Weekly Fast Food	0.215	-0.209

## Discussion

- Consuming fast food comprises a pro-inflammatory diet, which is significantly associated with an increased risk for depression (Xu et al., 2020). This may explain why Western diet foods were found to be positively associated with mental distress in this study.
- Inflammation plays a role in the development and progression of depression through oxidative stress accumulation, so the consumption of low nutrient foods, such as those from the Western diet, may activate inflammatory pathways and increase the risk for mental health issues (Lahouti et al., 2021).
- Inflammation may also play a role in the comorbidity between gut issues, and depression and anxiety (Aslam et al., 2020).
- Diet has been found to impact the gut microbiota, as micronutrients are essential for body function, including the immune systems (Statovci et al., 2017).
- Consuming a Western diet is associated with an increased risk for metabolic diseases associated with inflammation (Statovci et al., 2017).
- However, fruits and vegetables contain high levels of essential vitamins and antioxidants, which have been found to contain anti-inflammatory properties and have beneficial metabolic effects on the brain that can protect against depression (Liu et al., 2020; Bayes et al. 2019; Ribeiro et al., 2017).
- Overconsumption of sugar, which is common in Western diet, can lead to a change in neuroplasticity. This reduces impulse control and neural pathways involved with emotions, which increases the chance of emotional disorders, such as anxiety and depression (Jacques et al., 2019).
- The high polyphenol content in the Mediterranean diet has a positive effect on mental health, as it increases the regulation of the body's natural defense systems. It also moderates the cellular signal pathways for cognitive processes. (Bayes et al. 2019).
- The synergy between polyphenols and monoamine oxidase reduces the monoaminergic neurotransmitter breakdown, therefore increasing serotonin and dopamine levels (Bayes et al. 2019).

## Acknowledgement

We would like to thank Dr. Lina Begdache and the other members of the BMINDs research group for the advice and direction given to us while conducting this research.

## References

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