



Diet and lifestyle intervention on chronic moderate to severe depression and anxiety and other chronic conditions



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ABSTRACT

This group study explored how an intervention of diet, lifestyle and behavior modification, including a plant-based diet, daily exercise and mindfulness techniques, would affect 500 adult men and women participants diagnosed with chronic moderate to severe depression and anxiety and other conditions during a 12 week period. An analysis of the health outcomes detailed in self-reported diary entries was carried out at the conclusion of the 12 week period. These reports noted improvements in depression, anxiety and all other conditions addressed by the study, with the majority of participants reporting substantial benefits. A six month follow up indicated that these benefits persisted in most of the participants. These results demonstrate that an intervention of diet, exercise, lifestyle and behavior modification may provide considerable benefits for moderate to severe depression and anxiety as well as other conditions.

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1. Introduction

Chronic diseases and conditions account for 7 of the top 10 causes of death in the United States [1]. Approximately 117 million people, or half of the American adult population, have one chronic illness and about one quarter of this population has two or more chronic diseases or conditions [1].

The role of diet in the prevention of chronic illness is a popular area of study in the scientific literature. The vast majority of these studies, however, do not analyze the long-term health outcomes of individuals who adhere to a particular diet. Notable exceptions are the Nurses' Health Studies (NHS) and the substantial body of research on the Mediterranean Diet, which stand out as major scientific investigations showing the significant long-term benefits of a healthy diet rich in vegetables, fruits, nuts and seeds in preventing chronic inflammatory conditions [2–6]. The NHS also offers compelling evidence of the disease-fighting effects of regular exercise [2]. However, as observational studies, the NHS could not explore the potential benefits of consuming a purely plant-based diet combined with regular exercise. These investigations also do not account for stress management among study participants.

Studies have demonstrated separately the benefits of a plant-

based diet, exercise and mindfulness-based de-stress exercises on chronic conditions. Research correlates a plant-based diet with healthy low blood pressure [7–9]. Limited research has explored the impact of a plant-based diet on depression and anxiety, though preliminary evidence suggests positive effects [10–12]. A small but growing body of research shows a plant-based diet may offer significant benefits to arthritis and pain sufferers [13–15]. The effects of a plant based diet on fatigue and insomnia is extremely sparse.

Exercise has shown to be beneficial for patients suffering from depression and anxiety [16–20]. Regular aerobic and resistance exercise help to alleviate pain [21–23] and reduce high blood pressure [24–27]. Clinical studies demonstrate that fatigue [28–30] and chronic insomnia [31,32] can be considerably helped by physical activity.

Mindfulness practices have been observed to relieve depression and anxiety [33–36]. Mindfulness-based techniques significantly help subjective markers of pain among patients [37–39]. Preliminary research indicates that mindful awareness practices may improve quality of sleep [40–42] and reduce fatigue in a variety of populations [43–47]. A definitive link between mindfulness techniques and healthy low blood pressure has not been established.

This present investigation aims to build on the conclusions of this research by examining the short-term effects of a rigorous diet, lifestyle and behavior modification program including adherence to an entirely plant-based diet, regular exercise and mindfulness-based de-stress practices on patients affected by chronic

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moderate to severe depression and anxiety and a range of other chronic conditions.

2. Materials and methods

2.1. Participants

Five hundred study participants were recruited from the general public. A group of 231 men and 269 women joined the program. All participants were required to provide medical records showing a diagnosis of chronic moderate to severe depression and anxiety. Many of the participants were also diagnosed with at least one other chronic condition with hypertension, pain, insomnia and fatigue being the most common. Participants were instructed to maintain regular contact with their physicians. Only their attending physician was to determine if medications were to be altered or eliminated.

2.2. Study design

This was a behavior modification study on the impact of lifestyle and diet on individuals suffering from chronic moderate to severe depression and anxiety. The study consisted of instruction on the necessary components of a healthy lifestyle: proper diet, juicing, detoxification, exercise, mindfulness and de-stressing techniques, environmental hygiene, and examination of beliefs and attitudes. Information on the prescribed intervention was given in weekly sessions of 2½ hours each, over a period of 12 weeks from the first meeting to the last. Medical supervision was provided by Luanne Pennesi, RN, a nurse practitioner with 36 years of experience including clinical nurse supervisor at Long Island Jewish hospital. Five nutritionists were available during the week to assist participants in implementing the recommended protocol.

2.3. The protocol

2.3.1. Diet

The diet prescribed was an anti-inflammatory plant-based diet with 70% raw and 30% lightly cooked foods. The daily diet was comprised of 60% non-refined complex carbohydrates, 20% protein, and 20% fats from healthy oils. Total daily caloric intake ranged from 1700 to 2700 calories. Men who led more active lifestyles were advised to consume 2200–2700 calories daily. Men who led less active lifestyles and women were advised to eat 1700–2200 calories daily.

The diet required complete elimination of certain foods, especially pro-inflammatory foods or food preparations, including refined carbohydrates and any wheat, gluten, dairy, meat, poultry, or shellfish. No caffeine, alcohol, refined sugar, or artificial sweeteners or chemicals such as additives, preservatives, coloring agents or flavorings, and no carbonated beverages, including sodas and seltzer were included. No conventional table salt, microwaved, deep fried, toasted foods, or nightshade vegetables were allowable. To minimize costs involved, participants were encouraged to buy the recommended staples of the diet in bulk. Recipes were given to the participants to encourage adherence to the protocol. The following daily dietary guidelines were suggested:

- Two 1 cup servings of plant-based protein from sources such as legumes or beans including lentils, navy beans, black beans, soybeans, kidney beans, split peas, adzuki beans, fava beans, pinto beans and mung beans. Protein intake ideally was 0.9 g/kg of body weight. Fiber intake was at least 35–50 g.

- Two 1 cup servings of plant-based gluten free grains including amaranth, buckwheat, quinoa, oats, brown rice and millet.
- One 3 oz serving of nuts or seeds including walnuts, almonds, pine nuts, hazelnuts, sesame seed, pumpkin seed, and sunflower seed.
- Beverages including herbal teas, bottled or filtered water, fresh squeezed organic fruit juice as well as almond-, rice-, and coconut-based beverages.
- Sweeteners including raw honey, brown rice syrup, raw coconut palm sugar, natural fruit sweeteners, and stevia.
- Three to 5 tablespoons of oils including flaxseed, avocado, extra virgin olive oil, coconut, macadamia and mustard seed oil. Foods were to be cooked at low heat temperatures.
- Nine servings of nutrient-dense fruits and vegetables (preferably organic). Additionally, one serving of sea vegetables.
- Fruits including fresh or frozen berries daily, purple or red grapes, apple, pear, melons, kiwi, citrus, star fruit, papaya, and pomegranate.
- Vegetables including kale, cabbage, arugula, bok choy, lettuce, asparagus, carrots, celery, watercress, beets, squash and sweet potatoes.
- Herbs and spices including cayenne, curcumin, basil, rosemary, oregano, thyme, chili peppers, anise, cinnamon, horseradish, wasabi, mustard, dill weed, fennel, and spearmint.
- Protein smoothie for breakfast including 20–25 g of vegetable protein from powder: pea, rice, or hemp, 1000–2000 mg vitamin C, almond-, rice-, and coconut-based beverage, 1 teaspoon chia powder or fennel seeds and 1 teaspoon coconut oil.

2.3.2. Juicing

- Participants were instructed to drink one 16 oz. fruit and vegetable juice per day during the first week and increase to two juices daily the second week and continue to add one juice per week until 6 juices per day was achieved at week six. They were advised to maintain 6 juices daily until the completion of the study.
- Suggested juice combinations included celery, cucumbers with apple, watermelon, grapefruit, or lemon.
- Additional suggested juicing foods included bok choy, cabbage, cilantro, parsley, kale, collard greens, beets, and chard.
- Dilute green vegetables with water.
- Apple seeds removed, citrus can be juiced whole with skin and lemon.
- Morning drink of juice of one teaspoon of lemon and of apple cider vinegar, and half teaspoon of manuka honey diluted in 8 oz. of water.

2.3.3. Environmental hygiene

- Declutter living space.
- Clean floors and surfaces with safe cleaners: can use hydrogen peroxide, rubbing alcohol.
- Remove indoor pollution sources, including outgassing furniture, carpet, and building materials.
- Use water filter, and veggie wash or apple vinegar to clean produce.
- Avoid secondhand smoke.
- Recommend houseplants or air filter for oxygen, purifying.

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