The Efficacy of Group Nutrition Education Within a Virtual Setting

Deja Ivy

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THE EFFICACY OF GROUP NUTRITION EDUCATION WITHIN A VIRTUAL SETTING

By

DEJA IVY
B.Sc., Life University, 2018

A Master’s Project Submitted to the Graduate Committee
in the Department of Nutrition at Georgia University in Partial Fulfillment
of the
Requirements for the Degree

MASTER OF SCIENCE

ATLANTA, GEORGIA

2021
Introduction

In the west, the predominant diet encompasses high-fat and high-caloric processed foods, including excessive amounts of refined carbohydrates, lipids, salt, sweeteners, and insufficient amounts of lean protein, fiber, and plant-based foods.¹ The Western diet increases chronic disease risk, weakens the immune response, promotes low-grade inflammation, and elevates the risk of total mortality.¹ Chronic diseases present substantial concern for population-level health and financial strain.²,³ According to the Centers for Disease Control and Prevention (CDC), diabetes and obesity treatments alone costs the US healthcare system $474 billion dollars annually.²,³

Nutrition interventions prevent and manage a plethora of diet-related diseases and conditions including vascular, hormonal, and immune-related illness in addition to supporting overall wellbeing.³ Perfectly Portioned Wellness (PPW) is an Atlanta-based nutrition company that offers integrative nutrition counseling for autoimmune disorders, gastrointestinal health, weight management, and chronic diseases, but also incorporates multiple facets of personalized health.

The Coronavirus pandemic has elevated public health concern about diet-related comorbidities because of the elevated risk of mortality. Moreover, there is also a need for virtual alternatives to face-to-face encounters. Hence, there is a high demand for online platforms to deliver health education. PPW is based on health approaches that are pleiotropic, defined as having more than one effect.⁴ It is widely recognized that optimizing nutrition, maintaining adequate sleep, engaging in physical activity, and managing stress produce pleiotropic health benefits. PPW is instituting an evidenced-based group program that is in a virtual setting called the Four Pillars of Health (FPH) that will encompass these four areas of wellness. Thus, this
Nutrition’s Impact on Chronic Diseases and Conditions

Obesity, Hypertension, and Diabetes

Weight loss is a sought-after goal for many Americans as 63% of adults have made a serious effort to lose weight in their lifetime.\(^5\) Excess body weight predisposes individuals to conditions including type two diabetes, hypertension, stroke, cardiovascular disease, and specific types of cancer.\(^5,6\) Further, obesity is the leading cause of premature death.\(^6\) The CDC reports 42% of adults and 19% of children in the US are affected by obesity and rates continue to trend upward.\(^6\) Not only is obesity an epidemic, it is a financial liability; Medicaid finances $28 million annually for obesity treatment costs.\(^7,8\)

Consuming nutritious foods can aid in weight loss, but it also provides health-promoting properties. Obesity is associated with systemic inflammation, and antioxidants such as vitamin C and E, omega-3 fatty acids in fish and fatty acids in legumes are known to attenuate and prevent the inflammatory process.\(^9\) Natural, whole foods such as fruits, vegetables, and whole grains are rich sources of vitamins, minerals, and fiber which are inversely associated with weight gain.\(^2,6,10\)

Hypertension, otherwise known as high blood pressure, is an obesity-related condition. Hypertension is classified as having systolic blood pressure (SBP) greater than 140 millimeters of mercury (mm Hg), or diastolic blood pressure (DBP) greater than 90 mmHg.\(^11\) Worldwide, one billion people are affected by high blood pressure, and it causes 9.4 million deaths each year.\(^1\)
The Dietary Approaches to Stop Hypertension (DASH) diet is routinely recommended as an anti-hypertensive intervention.\textsuperscript{12} Since high blood pressure is associated with obesity, the DASH diet mirrors what is recommended for weight loss. It encourages the consumption of fruits, vegetables, legumes, and whole grains.\textsuperscript{2} Hypertension damages a vascular health by leading to clogged arteries and an increasing risk of a cardiovascular event or stroke. Hence, it emphasizes consuming low-fat dairy and lean protein.\textsuperscript{12} Recent literature supports that ginger, turmeric, and tea should be consumed regularly as they are known to promote vasodilation and hypotensive effects on the body.\textsuperscript{13}

The American Heart Association encourages lifestyle modifications, such as a change in diet and increased physical activity, to manage prehypertension (SBP of 120-129 and DBP greater than 80).\textsuperscript{14} Clinical data supports even minor incremental reductions in blood pressure can reduce the risk of adverse events.\textsuperscript{11} In fact, there is a 13–28\% lower risk of cardiovascular disease events and all-cause mortality for every 10-mm Hg reduction in systolic blood pressure.\textsuperscript{11} Under the current guidelines for lifestyle modification and prehypertension, food intake could attenuate blood pressure and have a significant impact on long-term health.

Diabetes affects one out of every ten people and 34 million adults in the United States.\textsuperscript{2} Similar to hypertension, type 2 diabetes (DMII) is a condition that is highly related to lifestyle.\textsuperscript{15} The vast majority of people with diabetes, 90\%, have the type two condition.\textsuperscript{15} DMII is characterized as a metabolic disease with high blood sugar levels and insulin resistance.\textsuperscript{15,16} Strategies for improving insulin sensitivity involve reducing the consumption of refined carbohydrates and simple sugars, increasing micronutrients such as vitamin D and zinc, and maintaining a healthy weight.\textsuperscript{10}
The general recommended intake for DMII is a low glycemic diet. Tree nuts and seeds have a favorable lipid profile rich in polyunsaturated fatty acids (PUFAS), which have been proven to positively impact glycemic control. Evidence confirms replacing carbohydrates with legumes, such as tree nuts and seeds, in the context of a low-carbohydrate diet (LCD), improves blood glucose levels and promotes weight loss. Additionally, consumption of fiber, high protein, and low glycemic foods all contribute to blood sugar control.

**PCOS, Menopause, and Low Testosterone**

Polycystic Ovary Syndrome (PCOS) is an endocrine disorder that occurs in women of reproductive age, and causes fertility, hormonal, and metabolic abnormalities. The syndrome affects 8-15% of premenopausal women. PCOS is characterized by hyperandrogenism, obesity, and reproductive issues. Some of the prominent complications are insulin resistance and an increased risk of hypertension and diabetes, but weight loss can help with PCOS management. Research indicates that a 5% reduction in weight is correlated with greater insulin sensitivity, fewer fertility issues, and decreased androgens levels.

Androgens are essential hormones in the reproductive system and include testosterone. The lack of androgen conversion to estrogen is one of the contributing factors of high testosterone levels, one of the principal problems for women with PCOS. Although an exact cause of this syndrome has yet to be identified, lifestyle modification is the most therapeutic approach. Thus, dietary patterns may have a vital role in the prevention and management of PCOS.

In contrast, hypogonadism is a clinical syndrome defined as insufficient testosterone levels (T <10 nmol) and androgen deficiency. BMI is inversely associated with
hypogonadism and overweight or obese men are more likely to experience testosterone deficiency. Additionally, this condition is more prevalent with aging. ³,¹² Literature supports that overweight and obese men who adhere to a low fat, low-calorie diet exhibited improvements with testosterone levels. ³,¹²

Menopause is the ceasing of a women’s reproductive cycle and begins when menstrual periods permanently stop.¹⁹ Traditional plant-based therapies to manage menopausal symptoms include phytoestrogens and herbal remedies.¹⁹ Two established, and long-standing, nutraceuticals used for menopause are soy isoflavones and soy extracts.¹⁹,²⁰ It is an emerging recognition that the consumption of flaxseeds protect against the harsh effects of menopausal symptoms.²⁰ Flaxseed is a phytoestrogen, and its metabolites exert estrogenic action.²⁰ Regular consumption of flaxseeds could increase quality of life by reducing sudden and undesirable menopausal symptoms such as the severity and frequency hot flashes.²⁰ However, further investigation is warranted to establish dietary intake recommendations of flaxseeds to accomplish a therapeutic effect on menopausal symptoms.²⁰

Autoimmune and Inflammatory Diseases

Inflammatory bowel disease (IBD) is caused by inflamed segments of the gastrointestinal tract.²¹ IBD affects the digestive system and greatly influences nutritional status and risk of nutrient deficiencies.²¹ Common deficiencies include folate, calcium, thiamine, and vitamins A, D, and B6.²¹ Fermentable Oligo-saccharides, Disaccharides, Monosaccharides, And Polyols (FODMAPs) are a family of poorly absorbed carbohydrates that cause unwanted symptoms in those with IBD. A low FODMAP diet is the primary nutrition intervention for IBD. Those affected by IBD can limit high fiber, FODMAP foods such as fruits, vegetables, and wholesome grains to relieve bothersome symptoms.²¹
Arthritis is a highly prevalent inflammatory disease that impacts one in four adults.\textsuperscript{2} There are over 100 different forms of arthritis, and it is characterized as painful joint inflammation that is often disabling.\textsuperscript{22} Osteoarthritis is the most prevalent form, and affects 18\% of women and 9.6\% of men over the age of 60.\textsuperscript{22} Some types of arthritis are autoimmune diseases in addition to being inflammatory, such as psoriasis, gout, fibromyalgia, and rheumatoid arthritis.\textsuperscript{22} Rheumatoid arthritis is a systemic inflammatory joint and autoimmune disease and globally impacts 1-2\% of the adult population.\textsuperscript{22} For centuries, ginger and turmeric are two herbal medicines utilized for numerous ailments, but they also possess antioxidant, anti-inflammatory, and antimicrobial properties that are useful for arthritis management.\textsuperscript{2,3} Anti-inflammatory diets that are abundant in dietary fiber, probiotics, omega-3 fatty acids, and antioxidants and are useful in managing arthritis symptoms.\textsuperscript{23} In contrast, soft drinks, alcohol, and red meat are proven to worsen autoimmune and inflammatory issues though the exact mechanisms are unknown.\textsuperscript{2,3,23}

**The Four Pillars of Health: The Combined Influence on Health Status and Wellbeing**

*Optimizing Nutrition*

Nutrition’s role in chronic disease and conditions continue to amass attention, but nutrition is also fundamental for health maintenance across the lifespan.\textsuperscript{24} In recent years, more literature on nutrition’s impact on brain and eye health has been conducted.\textsuperscript{24-26} The human brain is enriched with fatty acids, namely arachnoid (ARA) and docosahexaenoic acids (DHA).\textsuperscript{27} For an infant’s nutrition, one of the strongest appeals of breastmilk is the DHA content, which supports brain development during the first one thousand days of life.\textsuperscript{24} Towards the end of the lifespan, abnormal fatty acid function is associated with neuropsychological issues such as mood disorders, dementia, Alzheimer’s and poor cognition.\textsuperscript{27} Adequate fatty acid consumption is also
recommended because PUFAs and its derivatives regulate brain inflammation, neurogenesis, cell survival, and synaptic function.\textsuperscript{27}

Similar to brain health, ocular function is particularly important during the developmental and final stages of life.\textsuperscript{25} Worldwide, 250 million people experience loss of vision such as diabetic retinopathy, glaucoma, cataract, and age-related macular degeneration.\textsuperscript{25,26} Vitamin A has an indispensable role in eye function as an activator of retinal and retinoic acid.\textsuperscript{26} Vitamins C and E, beta-carotene, and zinc are established nutraceuticals that may reduce the risk of vision loss and promote ocular health.\textsuperscript{25} Carotenoids lutein and zeaxanthin are also suspected to combat ocular diseases, but further research is warranted.\textsuperscript{25}

Optimizing nutrition can also have therapeutic effects on our digestive system and promote gut health. The gut microbiome is responsible for intestinal homeostasis and affects the immune system by inhibiting pathogens.\textsuperscript{28} The consumption of prebiotics, fiber-rich foods, and probiotics leads to a nourished, robust microbial community.\textsuperscript{28} Oppositely, it is known that the westernization of diet imbalances the microbiome by causing a loss of microbiome diversity. The western pattern of eating also increases IBD risk because it is low in fiber and nutrient-dense foods.\textsuperscript{29}

\textit{Adequate Sleep}

Sleep is essential for cell turnover, immune response, growth and development, and optimal function.\textsuperscript{30} Sleep also contributes to cardiovascular health as it is responsible for the repair and healing of the blood vessels and heart.\textsuperscript{31} Yet, the CDC estimates that 20\% of the US adult population is not getting enough sleep to maintain proper health.\textsuperscript{32} The American Sleep Association reports that 50-70 million adults have a sleeping disorder, and 3-5\% of the overall
proportion of obesity can be attributed to sleep issues in adults. Thus, inadequate sleep is associated with increased diseases risk and BMI.

Each person’s circadian rhythm is comprised of biological processes within a 24-hour dark-light cycle that coordinates with the earth’s environment. The circadian rhythm regulates the sleep cycle by stimulating the release of hormones. Serotonin and norepinephrine levels are elevated during daylight hours as the eyes interact with sunlight and promote feelings of being alert, happy, and restful. At night, melatonin levels rise to assist with falling and staying asleep.

Other factors that affect sleep are related to intake. Alcohol consumption disrupts sleep and alters sleep architecture. Alcohol initially behaves as a sedative, leading to a shorter time to fall asleep, but then decreases rapid eye movement (REM) and sleep quality. The human gut and its metabolites also impact sleep duration and regulate circadian rhythms. Bacteria in the microbiota regulate cells that produce the majority of serotonin in the body which directly impacts wakefulness and indirectly impacts sleepiness since serotonin is also the precursor to melatonin. Moreover, the overgrowth of specific gut bacteria can induce fatigue, lead to sleep loss, and cause sleep disturbance.

Physical Activity

Aerobic exercise has been a long-established modulator of vascular health, and health professionals often recommend moderate to intense exercise to improve cardiorespiratory fitness. Mounting evidence argues that aerobic exercise may have more of an impact on how we function. Recently, aerobic exercise and resistance training have been identified as interventions for managing anxiety, distress, obsessive compulsive, and posttraumatic stress disorders.
As we age, falls and lack of balance are major threats to health status.\textsuperscript{36} Globally, approximated 30-40\% of adults 65 years or older fall each year, with an increase of fall rates to 50\% for adults over 80 years old.\textsuperscript{36} In a study that reviewed different exercises, tai chi associated with a 20\% reduction in the numbers of falls of those living in a senior community.\textsuperscript{37} Though cardiovascular health and muscle mass are often the focus of physical fitness, physical activities related to balance are crucial to our safety.

\textit{Stress Management}

Chronic stress is characterized by intrinsic or extrinsic factors that threaten the body’s homeostasis and evokes a biological response.\textsuperscript{38} Stress impedes on our immune response, digestive processes, endocrine systems, and cognitive abilities.\textsuperscript{38-40} Stress is intricately involved in the process of memory cognition.\textsuperscript{38} Cognition is the union of attention, learning, decision-making and judgement that sway our perception and recognition.\textsuperscript{38} Stress has an inverse relationship is cognition, and low stress enhances our cognitive performance.\textsuperscript{38} It can restructure and alter hippocampus function, which is responsible for the conversion of short-term to long-term memory. Stress can also cause shifts in the spatial memory capacity.

Although chronic stress is regarded as a biological response, it is also acknowledged as the daily interaction with a demanding environment.\textsuperscript{40} This type of stress can derive from a lack of coping mechanisms or social support and can cause psychological reactions like depression or sleeping disorders.\textsuperscript{40} Regardless of the source, chronic stress is a risk factor for vascular disease and is recognized as a potent modulator of chronic diseases.\textsuperscript{40,41}

\textbf{The Efficacy of Health Programs to Facilitate Behavioral change}

\textit{Behavioral Change: Stages, Theories, and Motivations}
The desired outcome of combining these evidence-based health interventions is behavior change. Nutritional behavior change is complex, and determining readiness and motivators is useful for accomplishing sustainable change. The Stages of Change, also known as the Transtheoretical Model, consists of six phases that gauge an individual’s intention and dedication towards a targeted behavior. At the Pre-Contemplation stage, the person is unaware or unwilling to change their health problem and have not considered altering their actions. The individual has given some consideration to altering their behavior in the contemplation phase. Small changes are made, with the intentions to act soon, at the Preparation stage. In the third Action phase, the person has made recent changes to address their health issue. The Maintenance stage is achieved after the desired behavior change is sustained for six months. Finally, after five years of persistent change the individual has reached the Termination stage. The Health Belief Model (HBM) theory states that each person’s health behaviors are motivated by their perceptions of their health condition. There are six perceptions that comprise the HBM: Susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. The HBM theorizes perceived benefits for an individual will increase the probability of adopting or maintaining a habit. The theory assumes a person will weigh perceived benefits against perceived barriers and self-efficacy to determine if the altered behavior is worthwhile and realistic. While the HBM is arguably focused on the psychology of the individual, the Social Cognitive Theory (SCT) assumes an observer will be motivated by positive reinforcement and results. The SCT theorizes that personal, behavioral, and environmental factors interact to influence action. This theory is often used in nutrition education and physical activity and emphasizes an individual’s behavioral capability such as goal setting, self-efficacy, and relapse prevention. Other aspects like outcome expectations, knowledge and skills, and creating a
conducive environment for change are also important for the SCT. These behavior theories are often blended together and used in health programs to achieve efficacy.

*Competitive Analysis: Commercial Programs and Their Results*

Weight loss is a goal for many Americans as 63% of adults made a serious commitment to lose weight over their lifetime. A study evaluated the efficacy of popular commercial programs to a health education curriculum with printed materials and no intervention. The results were categorized by short-term or long-term efficacy. In comparison to the control education, low-calorie programs that exhibited greater participant weight loss percentages within a 3-month period were Medifast (4.0%), NutriSystem (3.8%), and HMR (4.0%). Contrarily, Weight Watchers (2.6%), Jenny Craig (4.9%), and Atkins (0.1-2.9%) displayed efficacy over a 12-month period in comparison with the control.

*The Efficacy of Weight Watchers*

Of the 2.5 billion dollars spent in the weight loss industry, Weight Watchers has 45% share of the revenue. The weight management industry grosses billions of dollars from consumers, but individuals of a low-income may not be able to afford these programs, although they are efficacious. Medicaid piloted Weight Watchers to be a part of their healthcare plans. In the trial, 20% of the participants lost over 5% of their body weight. Although losing weight is often marketed commercially as a means to feel accomplished or to look better, as previously discussed, even a 5% reduction in weight loss can positively impact blood pressure and insulin sensitivity. Weight Watchers participants who attend more than 13 meetings have more weight loss at 6.5%, which have positive medical implications. Medicare financed weight loss services include nutrition counseling, bariatric surgery, and medication. When comparing the cost
benefits between Weight Watchers and bariatric surgery, it was estimated that nutrition counseling costs $35 per pound vs. $86 per pound with bariatric surgery.7

The Four Pillars and Behavioral Change

The FPH program will conduct live weekly nutrition counseling sessions with a registered dietitian (RD) within a supportive group setting. Along with nutrition counseling, the FPH program offers tools for wellness management, such as health education modules and education materials. According to the Transtheoretical Model, the FPH approach may encourage someone in the contemplation or preparation stage to advance to the next phase by increasing self- efficacy and knowledge of healthy habits.8,43

The FPH begins each live session discussing the benefits of each pillar of health, which promotes positive reinforcement. Then, the RD will offer advice on how to incorporate health practices. The participants will undergo SMART goal setting and self-assessments before and after each module.43 Each of these components encourages behavior change according to HBM and SCT. The HBM advocates that perceived benefits and increased self-efficacy will improve the likelihood of putting knowledge to action of a health behavior will facilitate change.44 Under the SCT, goal setting, positive reinforcement, and a supportive environment will encourage behavioral change.44 By combining counseling, reflection, and realistic suggestions for shifts in health behaviors during each module, it may increase the probability of behavioral change.43

Conclusion

The CDC estimates that 75% of the healthcare spending in the U.S. are spent treating chronic diseases that could be avoided through preventative care- $260 billion dollars per year.46 As the United States healthcare system approaches bankruptcy, multi-prong behavior interventions are fundamental for cost containment.7,47 Further, there are many other health-
related conditions and ailments that affect billions of people which are not discussed as often with healthcare spending. Still, these issues degrade quality of life and cause distress.

The WHO defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.\textsuperscript{48} The implications of this definition are that the U.S. healthcare system should be rooted in wellness programs and preventative services that promote healthy lifestyle, not solely on disease management. Facts about consuming nutrient dense foods and how it will reduce the risk of chronic disease is becoming common knowledge, but information about how it supports brain health, the immune system, and leads to feelings of wellbeing is still being discovered. Similarly, research is revealing how adequate sleep influences hormone status, that physical activity is necessary for balance and preventing falls, and how stress management impacts our ability to retain information all are emergent in the greater understanding of our health behaviors. The culmination of these different lifestyle factors supports wellbeing and the ability to function properly. The goal of the \textit{FPH} program is to provide information, and effective tools for implementing the four pillars into a routine for the participants. Optimizing nutrition, adequate sleep, physical activity, and stress management in one program is a wholesome approach as these lifestyle factors work in concert to promote or degrade health.

\textbf{Methods}

\textit{Finding Your Foundation Mini Course}

To create a marketing tool for potential customers to participate in the \textit{FPH} program, a free mini course is being offered by PPW called \textit{Finding Your Foundation}. The course is a preview of the content and format of the \textit{FPH}. It features four voice over lessons that discusses health practices and benefits for each pillar of health. The topics include the impact of pre and
probiotics on optimal nutrition, understanding your circadian rhythm for adequate sleep, benefits of balance exercises for physical activity, and mindful eating for stress management. Participants will leave the mini lessons with tangible ways to improve their health, such as knowing how to build a meal or incorporate macronutrients. Each lesson includes a mini pre and post self-reflection on health behaviors and an educational handout to serve as a visual reminder of lessons learned.

*FPH Program*

The *FPH* program is an interactive learning experience for the participants. Each week, participants will view a recording of a module on one pillar of health. All modules begin with three components: First, the RD will discuss how each pillar has a greater impact on overall wellness, with acknowledgement to our physical, emotional, and mental health. Next, it takes a moment to recognize barriers for participating in health behaviors which validates the need for dedication and assistance to make sustainable changes. The introduction to each module concludes with a pre assessment, during which the participant is able to actively engage in assessing their areas of strengths, opportunities, and goals.

The module continues with a lesson on the featured pillar with facts and practical tips on how to improve health habits. Additionally, handouts for each section will offer visual support and reminders of simple, everyday actions the participants can take. Finally, open dialogue will be encouraged during the live, group coaching session led by the RD and time will be allotted for questions on course content.
Implications

The implications of this research are that the target market can improve their overall health and wellbeing by participating in a program that utilizes behavioral change theories. It is clear from public health concerns and financial strain that behavioral change is not accomplished by simply stating health facts. Health professionals, including RDs, are needed to help patients and clients apply knowledge and achieve behavioral change. This program uses select tools and approaches that will increase the likelihood that participants will feel able to make sustainable change.

Evaluation

The future aims of this project would be to evaluate the efficacy of the FPH program. Pre and post assessments would be utilized to determine quantifiable changes in health knowledge and participant behavior.
Finding Your Foundation: A Mini Course on Four Pillars of Wellness

A Capstone Project by Deja Ivy

Overview

Introduction
Literature Review
Demonstration of Mini Course
Market Comparison
Behavioral Theories
Future Directions
Conclusion
INTRODUCTION: THE SAD DIET

The Western Diet

- Weakens the immune response
- Promotes low-grade inflammation
- Elevates the risk of total mortality

Chronic Disease Epidemic

- The SAD increases chronic disease risk
- Rates continue to trend upward

INTRODUCTION

CHRONIC DISEASES IN AMERICA

6 IN 10 Adults in the US have a chronic disease

4 IN 10 Adults in the US have two or more

THE LEADING CAUSES OF DEATH AND DISABILITY and Leading Drivers of the Nation’s $3.5 Trillion in Annual Health Care Costs

Image sourced from the CDC

Financial Burden

- Each year, 3.5 trillion dollars on chronic disease treatments.
- 75% of the healthcare spending in the U.S. are spent treating preventable chronic disease, upwards of $260 billion dollars per year.

Preventative Solutions

Lifestyle modifications are routinely recommended as the first-line approach to prevent chronic disease onset and progression.

PERFECTLY PORTIONED WELLNESS

Nutrition company that offers integrative nutrition counseling by a RDN

- Chronic disease and weight management
- Autoimmune and inflammatory diseases, GI and hormone health
- PPW is based on health approaches that are pleiotropic, defined as having more than one effect.
## NUTRITION AND HORMONE HEALTH

<table>
<thead>
<tr>
<th>Condition</th>
<th>Nutrition Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCOS</td>
<td>• A 5% reduction in weight is correlated with greater insulin sensitivity, fewer fertility issues, and decreased androgens levels. 5</td>
</tr>
<tr>
<td></td>
<td>• Overweight and obese men who adhere to a low fat, low-calorie diet exhibited improvements with testosterone levels. 6</td>
</tr>
<tr>
<td></td>
<td>• Phytoestrogens therapies to manage menopausal symptoms include soy isoflavones, soy extracts, and flaxseeds. 7</td>
</tr>
<tr>
<td>Hypogonadism</td>
<td></td>
</tr>
<tr>
<td>Menopause</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Androgen deficiency leading to low testosterone 6</td>
</tr>
<tr>
<td></td>
<td>• Hormonal shifts, including decreased estrogen 7</td>
</tr>
</tbody>
</table>

## NUTRITION, AUTOIMMUNE AND INFLAMMATORY DISEASE

<table>
<thead>
<tr>
<th>Condition</th>
<th>Nutrition Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammatory bowel disease</td>
<td>• A low FODMAP (Fermentable Oligo-saccharides, Disaccharides, Monosaccharides, And Polyols) diet and limiting fiber 10</td>
</tr>
<tr>
<td>Autoimmune Arthritis</td>
<td>• Herbal remedies (ginger and turmeric), anti-inflammatory diet (fiber, probiotics, omega-3 fatty acids, and antioxidants), and avoidance of soft drinks, alcohol, and red meat 8</td>
</tr>
<tr>
<td></td>
<td>• Some types of arthritis are autoimmune diseases in addition to being inflammatory</td>
</tr>
<tr>
<td></td>
<td>• Psoriasis and rheumatoid arthritis 8</td>
</tr>
</tbody>
</table>

## FOUR PILLARS OF HEALTH

- Nutrition
- Physical Activity
- Sleep
- Stress Management
SLEEP

Overall Health
Essential for cell turnover, immune response, growth and development.¹¹

Hormone Regulation
Simulates the release of serotonin, norepinephrine, and melatonin in accordance with our circadian rhythm.¹¹

Cardiovascular Health
Sleep responsible for the repair and healing of the blood vessels and heart.¹²

PHYSICAL ACTIVITY

Aerobic Exercise
A long-established modulator of vascular health. Moderate to intense exercise is recommended for cardiorespiratory fitness.¹³

Balancing Exercises
Useful for preventing falls and lack of balance, which are major threats to health status.¹⁴

Managing Mental Illness
Aids in managing anxiety, distress, obsessive compulsive, and posttraumatic stress disorders.¹⁵

STRESS MANAGEMENT

Overall Health
Stress impedes on our immune response, digestive processes, endocrine systems, and cognitive abilities.¹⁶

Memory and Cognition
Stress can restructure/alter hippocampus function, affecting long-term memory, and cause shifts in the spatial memory capacity.¹⁷

Disease Risk Factor
Chronic stress is a risk factor for vascular disease and is recognized as a potent modulator of chronic diseases.¹⁶
PURPOSE

To investigate the potential efficacy of group nutrition education for within a virtual setting.

MARKET COMPARISON

<table>
<thead>
<tr>
<th>Program</th>
<th>Length of Time</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolism Makeover</td>
<td>One month program, with an option to continue month-to-month</td>
<td>Weekly check-ins with RD, food selection guides, ~20 video trainings</td>
</tr>
<tr>
<td>Nutrition Weight and Wellness</td>
<td>None, Package Deal</td>
<td>12 online sessions or 3 1-hour RD consults, personalized meal plan</td>
</tr>
<tr>
<td>Intuitive Eating Essentials for Midlife, Menopause, and Beyond</td>
<td>Two-month program</td>
<td>1 30-minute private session with RD, 8 modules, weekly support group sessions</td>
</tr>
</tbody>
</table>

INCORPORATING BEHAVIORAL THEORIES

- **Stages of Change**
  Increased self-efficacy and knowledge of healthy habits can contribute to change.

- **Health Belief Model**
  Perceived benefits and fewer perceived barriers will improve the likelihood of putting knowledge into action and facilitate change.

- **Social Cognitive Theory**
  Goal setting, positive reinforcement, and a supportive environment will encourage behavioral change.

- The program offers health education modules, education materials, and nutrition counseling from an RD.

- During modules and live sessions, participants will be told about the health benefits about, and practical ways to incorporate new habits.

- Participants will have the instruction and dialogue in a supportive group setting and set SMART goals for realistic behavior change.
## Benefits and Limitations of Program

### Benefits

**Virtual Programming**
- Allows for a greater reach, audience, and can create a community
- More people are seeking online programming vs in-person.

**Evidence-Based**
- Curriculum, recommendations, and strategies for behavior change are based on scientific literature

### Limitations

**Virtual Fatigue**
- Virtual program engagement may be a challenge and commitment may wane

**Subjective Pre and Post Assessments**
- Data from pre-post assessment responses can be skewed when relying on self-reports

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## Future Directions and Conclusion

- The goal of the FPH program is to provide information, and effective tools for implementing the four pillars into a routine
- Optimizing nutrition, adequate sleep, physical activity, and stress management in one program is a wholesome approach as these lifestyle factors work in concert to promote or degrade health.
- Future aims include evaluating its efficacy with pre and post assessments to determine quantifiable changes in health knowledge and participant behavior.
Capstone Project

Participant Pre-assessment

Optimizing Nutrition
Please take a moment to assess yourself.

Continue press Enter ↵

1. Please select the answers that best apply:
   I know the difference between prebiotics and probiotics.
   - A Yes
   - B Somewhat
   - C No

2. My meals have all the food groups.
   - A Yes
   - B Somewhat
   - C No

3. Before I eat, I have a plan of what my meal will include.
   - A Yes
   - B Sometimes
   - C No
Optimizing Nutrition Module

Finding Your Foundation

A Mini Course on Optimizing Nutrition

The Gut Microbiome: What does it do?

**Impacts Sleep**
What our gut digests can shift the hormones that help us to fall and stay asleep.

**Houses the Immune System**
70-80% of our immune system is in our gut.

**Assists with Digestion**
The microbiome breaks down macronutrients, such as carbs, protein, and fat for digestion.
Building a Balanced Plate

- Use unhealthy oils (like palm and coconut oils) on the stovetop and at the table. Limit butter. Avoid trans fats.

- The more veggies — and the greener they are — the better. Potatoes and French fries don’t count.

- Eat plenty of fruits of all colors.

- Drink water, tea, or coffee with little or no sugar. Limit milk (1½ servings/day) and juice (1 small glass/day). Avoid sugar drinks.

- Eat a variety of whole grains: brown rice, whole wheat bread, whole-grain pasta, and brown rice. Limit refined grains (like white rice and white bread).

- Choose fish, poultry, beans, and legumes. Limit red meat and processed meats. Avoid bacon, cold cuts, and other processed meats.

Challenge Yourself

- Build a balanced plate at each meal
- Try a new pre or probiotic
Optimizing Nutrition
Please reflect on how you balance your meals.

1. Write one way you will balance your meals.

Type your answer here...

2. What is one prebiotic food you can eat regularly?

Type your answer here...

3. I feel confident I know which foods to eat to support my gut.

- Yes
- Somewhat
- No
References


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33. American Sleep Association. Sleep and Sleep Disorder Statistics. 2021


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