The Mediterranean Diet & Heart Disease: Measuring Knowledge Through Provider Education

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Abstract

Background

The diagnosis of heart disease is a rapidly growing diagnosis within the United States (American Heart Association [AHA], 2023). Heart disease development secondary to inflammatory processes has become a growing concern as this diagnosis continues to increase amongst adults (Tristan et al., 2023). The effectiveness of anti-inflammatory diets, specifically the Mediterranean Diet (MD), in alleviating symptoms of heart disease has been demonstrated (Bawaked et al., 2017). Delivering MD education to healthcare providers through an educational intervention is a practical educational intervention that can be employed to offer providers a reference point to enhance treatment outcomes. The purpose of this project was to implement an evidence-based educational intervention to provide MD education to primary care providers, and measure the efficacy of the intervention by testing knowledge before and after completion.

Methods

Five primary care healthcare providers received the educational intervention. Pre- and post-tests were used to collect data. Descriptive statistics were used to analyze the data. Percentages were computed for both the pre and post-test responses.

Results

The computed percentages from the pre and posttest responses were compared to identify changes in knowledge after completion of the educational intervention. After analysis of the participants responses, an increase in knowledge was illustrated through positive trends in the data.

Conclusion

An evidence-based educational intervention shows promise as an effective method of educating primary care providers and increasing knowledge on the MD. Further implementation must be executed to better understand the efficacy of the intervention.

Keywords: chronic inflammation, anti-inflammatory diets, chronic illness, chronic illness and diet, relationship between diet and inflammation

Introduction

According to the American Heart Association, more than 900,000 deaths were caused by heart disease in 2020 (American Heart Association [AHA], 2023). The development of heart disease secondary to inflammation within the body has become a pivotal area of concern worldwide with the increase in the diagnosis of heart disease in adults (Tristan et al., 2023). Inflammation is a physiological response within the body used to protect individuals from harmful pathogens such as infections, however, when inflammation becomes chronic, the body is placed at a higher risk for developing chronic illness (Wawrzyniak-Gramacka et al., 2021). Chronic inflammation is a notable trigger in the early development of cardiovascular disease (CVD), and an increase in inflammatory biomarkers within the body is associated with a high risk of developing heart disease (Sorriento & Iaccarino, 2019).

In understanding the relationship between heart disease and chronic inflammation, a correlation can also be seen between heart disease development and the consumption of ultra processed, pro-inflammatory foods (Tristan et al., 2023). An unhealthy diet containing processed foods increases inflammation in the body due to ingredients such as preservatives, sodium, and sugar, therefore making pro-inflammatory foods the leading risk factor connected to cardiovascular disease (Juul, Vaidean, & Parekh, 2021). Studies have shown with the adoption of an anti-inflammatory diet, specifically the Mediterranean Diet (MD), inflammation can be reduced in the body thus reducing the risk of heart disease development (Bawaked et al., 2017).

With the rise in the incidence of heart disease, it is important to address diet as it is a modifiable risk factor to support lowering the development of cardiovascular complications in primary care. This project implemented an evidence-based educational intervention for healthcare providers on the MD within the primary care setting with the goal of increasing provider knowledge (Appendix A). The purpose of this project was to increase provider

knowledge on the MD in relation to heart disease so they can fully educate patients, both at risk and already diagnosed with heart disease, on specific diet modifications that can be made in order to better manage their symptoms and prevent the development of comorbidities.

Review of Literature

The purpose of the review of the literature (ROL) was to examine the evidence supporting anti-inflammatory foods and the effects on chronic conditions induced by chronic inflammation. The Mediterranean Diet (MD), a diet that has been known to have anti-inflammatory benefits, was specifically reviewed due to the abundant evidence supporting it's ability to reduce inflammation and reduce symptoms associated with chronic disease (Vahid & Rahmani, 2021). A review of the literature was conducted using the National Library of Medicine (NLM) database from the National Center for Biotechnology Information and PubMed. A search was completed to find publications between the years 2017 and 2023 to be included in this review. The following keywords were used in the search: "chronic inflammation", "anti-inflammatory diets", "chronic illness", "chronic illness and diet", and "relationship between diet and inflammation." The initial search resulted in 40 articles. Those articles were reviewed, and the Johns Hopkins Evidence-Based Practice Model for Nursing and Healthcare Professionals was used to score each article. Ten articles from the NLM database and 5 articles from PubMed scored I, II, or III and were included in the final analysis consisting of systematic reviews and meta-analyses as their supporting evidence was most relevant to the purpose of this study. Twenty-five articles scored IV or V and were excluded from the review.

ROL Populations

The articles included in the review covered a wide variety of populations and diagnoses. Both men and women were included in the studies reviewed, and the age of participants ranged from children to adults. Inflammation induced diagnoses included rheumatoid arthritis (RA) (Hulander et al., 2021; Schönenberger et al., 2021), depression (Shivappa et al., 2018), diabetes (Bagheri et al., 2018), chronic fatigue (Haß et al., 2018), cardiovascular disease (Harvard School of Public Health, 2022; Juul et al., 2021; Li et al., 2020; Richardson et al., 2022; Sorriento & Iaccarino, 2019), respiratory disease (Vahid & Rahmani, 2021), and cancer (Furman et al., 2019). Populations in which individuals were obese were also included as this condition has been linked to chronic inflammation (Bawaked et al., 2017).

Importance of Diet in Chronic Inflammation Conditions

The efficacy of the MD was measured and illustrated in several different ways. One study measured the outcome of the effects of an anti-inflammatory diet using a food frequency questionnaire, and found females eating a larger amount of pro-inflammatory foods have a 30% higher incidence of depression (Shivappa et al., 2018). Several studies used inflammatory markers in the blood such as c-reactive protein (CRP), and interleukins (ILs) to collect data and/or measure effectiveness as elevated levels of these markers indicate inflammation within the body (Bawaked et al., 2017; Hulander et al., 2021; Wawrzyniak-Gramacka et al., 2021).

In conducting this ROL, nine of the 15 articles found evidence that supported the efficacy of an anti-inflammatory diet in reducing inflammation in the body, and thus prevented or reduced the severity of chronic illnesses (Bagheri et al., 2022; Bawaked et al., 2017; Furman et al., 2019; Hulander et al., 2021; Mukherjee et al., 2022; Tristan Asensi et al., 2023; Tsigalou et al., 2020; Vahid & Rahmani, 2021; Wawrzyniak-Gramacka et al., 2021). One study found the

MD, veganism, and vegetarianism to be particularly effective in reducing inflammation within the body (Vahid & Rahmani, 2021). Two studies found the implementation of an anti-inflammatory diet to be beneficial in reducing pain associated with rheumatoid arthritis (RA) patients (Hulander et al., 2021; Schönenberger et al., 2021), and the severity of symptoms in individuals diagnosed with depression (Schönenberger et al., 2021; Shivappa et al., 2018).

Li et al. (2020) found that implementing an anti-inflammatory diet can reduce the risk for CVD (Li et al., 2020). Three studies were unable to find evidence to support the use of diet as a form of treatment for inflammation reduction (Haß et al., 2019; Hess et al., 2021; Stumpf et al., 2023).

The Mediterranean Diet for Heart Disease

The MD has been defined as "a traditional eating pattern found among populations living in the Mediterranean Basin during the 50s and 60s of the 20th century" (Martínez-González et al., 2019, pg. 1). The MD consists of a diet rich in lean protein, healthy fats such as olive oil, nuts, seeds, fermented dairy such as yogurt, fruits, and vegetables; it excludes processed meats, butter, ice creams, or other whole-fat dairy products (Martínez-González et al., 2019; Guasch-Ferré & Willett, 2021). Due to high amounts of antioxidants and polyphenols, the MD reduces inflammation in the body, thus decreasing the toll inflammation can have on the cardiovascular system (Martínez-González et al., 2019).

Studies have shown major cardiac events such as myocardial infarction and stroke have decreased in individuals with heart disease as well as total cholesterol levels after five years on the MD (Martínez-González et al., 2019; Guasch-Ferré & Willett, 2021). A 14-29% reduction in heart disease diagnoses has been demonstrated with adherence to the MD (Guasch-Ferré &

Willett, 2021; Harvard School of Public Health, 2022). A reduction in oxidative stress has been shown with MD adherence, thus reducing heart disease development (Stumpf et al., 2023).

Discussion/Synthesis

Amongst the findings within the 15 studies included in this ROL, many similarities were illustrated. Nine of the 15 articles supported the use of anti-inflammatory diets for reducing chronic inflammation and disease; therefore there is promise with applying anti-inflammatory diets as a treatment option. Within these nine articles, two specifically found antioxidant rich foods, including berries, dark leafy greens, and green tea, to be particularly beneficial on an anti-inflammatory diet to promote inflammation reduction (Bawaked et al., 2017; Tsigalou et al., 2020). The remaining seven articles in support of the anti-inflammatory diet followed the diet definition listed previously in this review (Bagheri et al., 2022; Furman et al., 2019; Hulander et al., 2021; Mukherjee et al., 2022; Tristan Asensi et al., 2023; Vahid & Rahmani, 2021; Wawrzyniak-Gramacka et al., 2021).

The differences in this ROL are illustrated in the three articles that were unable to find evidence supporting an anti-inflammatory diet for chronic inflammation and disease treatment (Haß et al., 2019; Hess et al., 2021; Stumpf et al., 2023). These three articles suggested that further research and studies must be conducted to determine the benefits of an anti-inflammatory diet (Haß et al., 2019; Hess et al., 2021; Stumpf et al., 2023). This same theme can be seen in the limitations found in the nine studies in support of the anti-inflammatory diet. All of these studies included the need for further research to solidify a concrete plan and use for the anti-inflammatory diet (Bagheri et al., 2022; Bawaked et al., 2017; Furman et al., 2019; Hulander et al., 2021; Mukherjee et al., 2022; Tristan Asensi et al., 2023; Tsigalou et al., 2020; Vahid & Rahmani, 2021; Wawrzyniak-Gramacka et al., 2021). Although an anti-inflammatory diet

showed promise in all nine studies, knowledge regarding these diets is still limited, and further studies must be completed in order to understand if reducing inflammation positively impacts specific organs and tissues versus just systemically (Bagheri et al., 2022; Bawaked et al., 2017; Furman et al., 2019; Hulander et al., 2021; Mukherjee et al., 2022; Tristan Asensi et al., 2023; Tsigalou et al., 2020; Vahid & Rahmani, 2021; Wawrzyniak-Gramacka et al., 2021).

In completing this ROL, the anti-inflammatory diet is encouraging in both the prevention and management of chronic inflammation and disease. Although a majority of articles in the review stated a need for further research and evidence, the MD shows promise as an intervention to decrease disease. By reducing inflammatory and processed foods, inflammation within the body can be lowered to promote more positive healthcare outcomes. However, although this appears to be promising, the studies demonstrating a need for further research on this topic should be addressed to further understand the impact anti-inflammatory diets have on inflammation. Based on the results presented, this capstone project looked further into specific anti-inflammatory properties to derive a plan for primary care providers to use in practice with their patients to prevent or reduce inflammatory processes. Additionally, the project sought to provide information more specifically about which foods work best for reducing inflammation rather than giving a loose definition for patients to use when trying to follow an anti-inflammatory diet.

The Iowa Model for Evidence-Based Practice Model

The steps of this project were guided by the Iowa Model (Iowa Model Collaborative, 2017) (see Appendix A). The trigger for this capstone project was how the MD can positively decrease the symptoms of heart disease. The priority of the topic within the setting of primary care was determined; in this case the topic was a priority as heart disease is a common condition.

Six medical providers from a primary care practice in Springfield, MA were then recruited to participate in this capstone project, and complete the educational intervention.

Evidence was synthesized after providers completed a pre-test prior to receiving the educational intervention, and a post-test after completing the intervention. An analysis was performed to determine if the educational intervention was useful and appropriate within the primary care setting. Based on the evidence, the benefit of the educational intervention was understood in relation to increasing knowledge about the MD and its effect on heart disease.

Methods

Design

A prospective pretest-posttest approach was used to evaluate the effectiveness of the MD educational intervention among primary care providers.

Ethics

This DNP project was submitted to the Institutional Review Board (IRB) for review, and found exempt of IRB approval as the proposed project did not involve research obtaining information about living individuals (see Appendix B). Privacy was maintained throughout this project by using a password protected Google document to keep all participant identifiers confidential, and only accessible to the researcher.

Project Site & Population

This DNP project took place at a primary care practice in Springfield, MA. This practice provides comprehensive care with a goal to help the community stay healthy and live more fully. The population included primary providers at this practice consisted of one medical doctor, four advanced practice registered nurses (APRN), and one physician assistant (PA).

Procedure

Intervention

An evidence-based educational intervention outlining the MD and the benefits it provides to patients with heart disease was utilized to educate providers. Using Google Slides, a 13-slide educational intervention was created based on the information found within the ROL; additional information was also included from the AHA, American Institute for Cancer Research, and Cleaveland Clinic. Within the educational intervention information was provided regarding the relationship between heart disease and inflammation, pro-inflammatory foods, and the benefits of the MD. Food lists and sample menus based on the MD were also included in order to provide tangible information for providers to provide to their patients. A pretest and posttest were also included before and after the educational intervention to measure provider knowledge. The intervention was sent to each participant via email to complete independently. An example of the educational intervention can be seen in Appendix C.

Measurement Instruments

A pretest and posttest was created based on the information collected through the ROL as no reliable resource existed to measure provider knowledge before and after completing heart disease education. Both the pretest (Appendix D) and posttest (Appendix E) included 17 multiple choice questions using a Likert Scale. Although reliability and precision were not confirmed in this study, a Likert Scale has been found to be 88% reliable and 89% precise when used in other research studies (Belita et al., 2022). The Likert Scale, used to measure opinions, attitudes, or behaviors, allows five answer choices: strongly agree, agree, neutral, disagree, and strongly disagree (Lionello et al., 2021). A neutral answer choice was included as an option in the instance that a participant had no previous knowledge or opinions regarding a question.

The pretest collected demographics of the participants including name, age, medical provider title, and years of experience practicing medicine whereas the posttest only collected name. Each section of the pretest and posttest were completed individually, and provided results to measure three areas: personal stance on diet and heart disease, the relationship between pre-inflammatory diets and heart disease, and knowledge about the MD. The posttest included a fourth section to measure the participants opinion on the efficacy of the educational intervention in increasing their knowledge of heart disease and the MD, and the likelihood of them applying it in practice.

Data Collection & Procedure

Six medical providers were recruited from a primary care practice in Springfield, MA. The educational intervention was sent to each participant through email with a request to complete it within a one-month timeframe (September 30, 2024 to October 30, 2024). Each medical provider received an email explaining the purpose of this DNP project as well as links to the pretest, educational intervention, and posttest through a password protected Google document on September 30, 2024. All responses and data were collected by October 5, 2024.

Pretest

In beginning the evidence-based educational intervention, a pretest questionnaire, created using Google Forms, was completed to obtain a baseline of the provider's knowledge and feelings towards the MD in aiding the treatment of heart disease. The pretest included 17 questions divided among three sections assessing personal stance on diet and heart disease (questions #1-5), the relationship between pre-inflammatory diets and heart disease (questions #6-11), and knowledge about the MD (questions #12-17). Answers to the questions on the pretest were based on the Likert Scale: strongly agree, agree, neutral, disagree, and strongly disagree.

Intervention

After completing the pretest, the providers moved through the evidence-based educational intervention on the MD at their own pace; the intervention took approximately one hour to complete. This 13-slide educational intervention was created using Google Slides to build an online educational intervention for medical providers to utilize at their convenience via the internet. The intervention included information on how pro-inflammatory foods cause heart disease, what the MD is, what foods the MD includes, MD sample menus, and how the MD can be implemented into practice.

Posttest

The same 17 questions in the pretest were included in the posttest, which was completed by each participant at the end of the educational intervention. The posttest also included a fourth section with two additional questions (questions #18-19) to measure the participants opinion on the efficacy of the intervention in increasing their knowledge of heart disease and the MD, and the likelihood of them using it in practice with patients (see Appendix E).

Data Analysis

Descriptive statistics were used to analyze pretest-posttest data. These statistics were then used to develop double bar graphs to visually compare changes in provider knowledge before and after completing the educational intervention.

Cost Benefit Analysis

This project did not incur any cost as both Google Slides and Google Forms are free online software which were used to create the online educational intervention and pretest-posttest. No additional materials were needed to complete this project as it was completed virtually.

Results

Demographics

A total of six primary care medical providers received an email to participate in this study and complete the educational intervention along with the pre and post-tests. All six participants completed the intervention for a response rate of 100%. The majority of the sample participants were female (67%) APRNs (67%). The demographic information for participants can be found in Table 1.

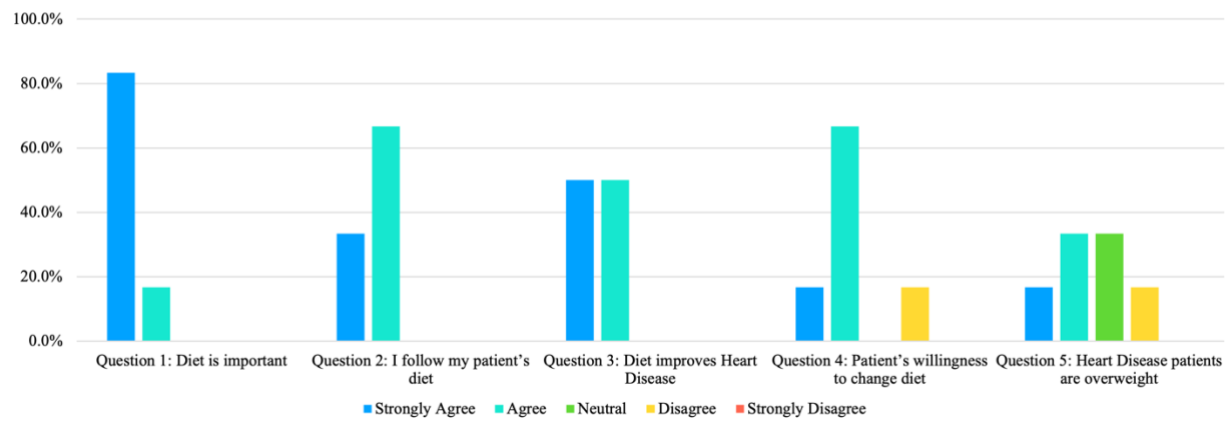
Table 1
Medical Provider Demographics

Medical Provider Characteristics	*n*	%
Gender		
Male	2	33.3
Female	4	66.7
Age		
30 to 39	3	50
40 to 49	2	33.3
50 or older	1	16.7
Medical Provider Credentials		
APRN	4	66.6
PA	1	16.7
MD	1	16.7
Years of Experience		
0 to 9	4	66.6
10 to 19	1	16.7
20 or more	1	16.7

Survey Section 1 Results

In Section one of the pre and post-test, the participants personal stance on diet and heart disease was assessed. Prior to completing the educational intervention 83% (*n*=5) participants strongly agreed that diet is important in relation to preventing and managing heart disease. All participants follow the diets of their patients when treating them for heart disease, with 33% (*n*=2) strongly agreeing, and 67% (*n*=4) agreeing. All participants also believe diet does improve heart disease with 50% (*n*=3) strongly agreeing, and 50% (*n*=3) agreeing. Participants differed in accordance with their opinion that patients with heart disease are overweight as 17% (*n*=1) strongly agree, 33% (*n*=2) agree, 33% (*n*=2) are neutral, and 17% (*n*=1) disagree; however, they do endorse patient willingness to change diet with a heart disease diagnosis with 66.7% (*n*=4) in agreement with this statement (see Figure 1).

Fig 1. Personal Stance on Diet & Heart Disease Pre-Test.



After completing the module, all participants believed diet is important for the prevention and management of heart disease with 100% (*n*=6) strongly agreeing. One additional participant strongly agreed to following their patient's diet increasing from 33.3% (*n*=2) pre-intervention to 50% (*n*=3) post-intervention. An increase in belief that diet does improve heart disease was also

seen as 83% (*n*=5) now strongly agreed. Only 17%, (*n*=1) remained in strong agreement that patients are willing to change their diet, however, after completing the intervention, participants no longer disagreed that patients with heart disease are not overweight (see Figure 2).

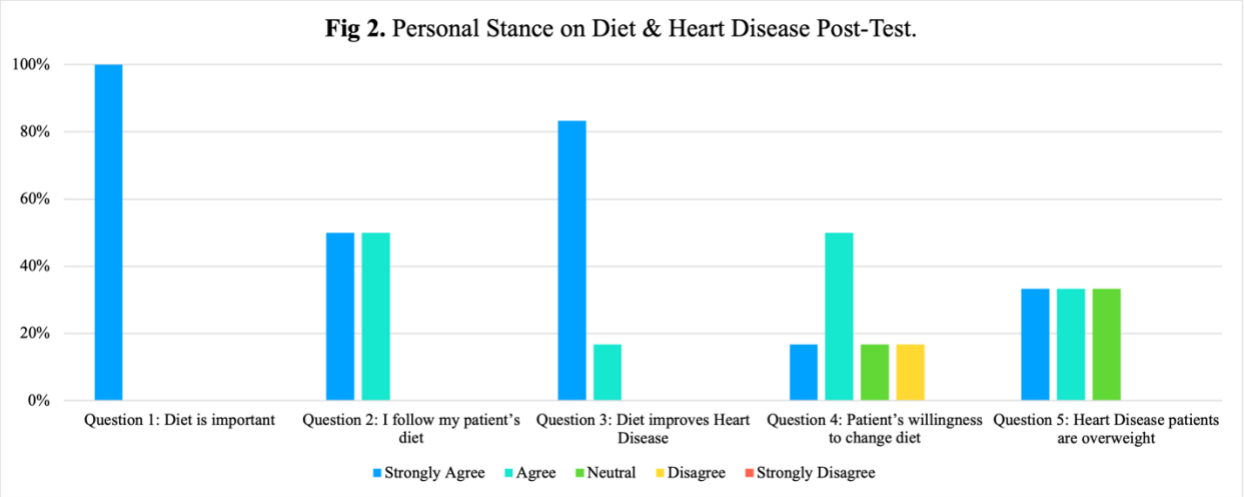
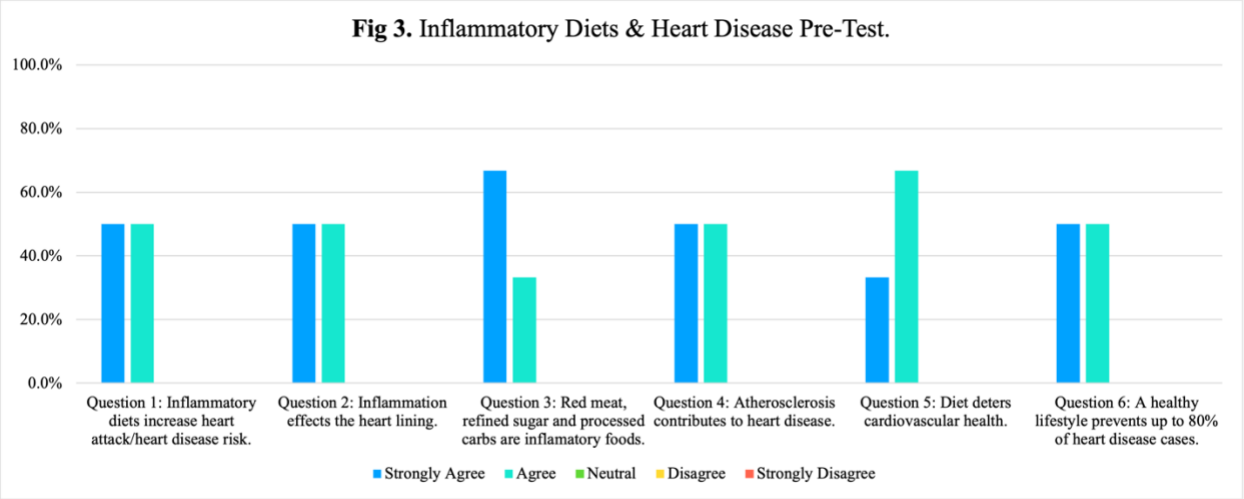


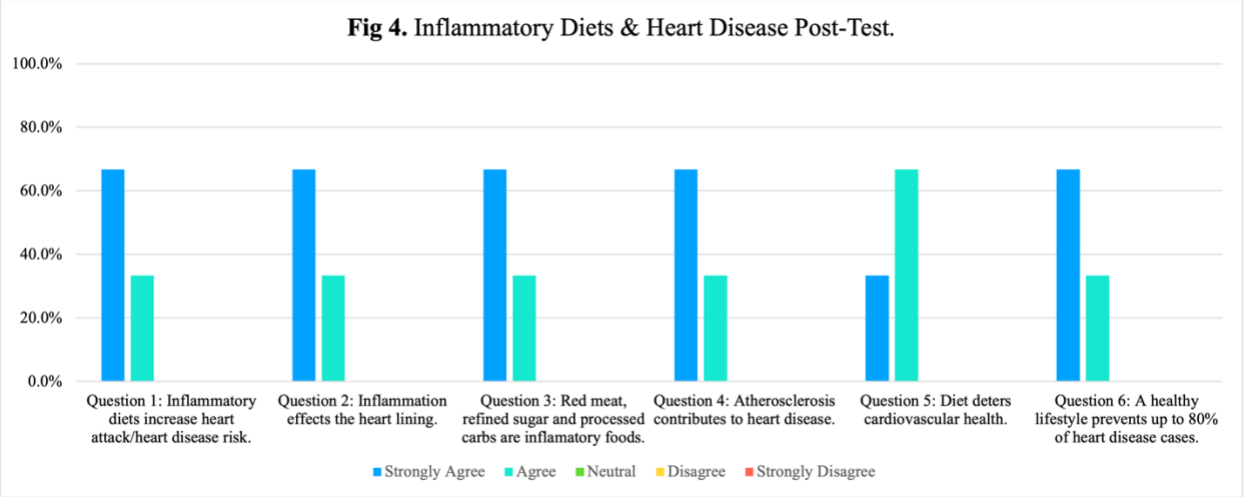
Fig 2. Personal Stance on Diet & Heart Disease Post-Test.

Survey Section 2 Results

Section two of the pre- and post-test assessed participant knowledge on inflammatory diets and heart disease. Prior to educational intervention completion, participants believed inflammatory diets and atherosclerosis increase heart disease risk by impacting the heart lining with 50% (*n*=3) strongly agreeing and 50% (*n*=3) agreeing. The same percentages believed a healthy lifestyle prevents up to 80% of heart disease cases. The majority (66.7%, *n*=4) strongly agreed that red meat, refined sugar and processed carbohydrates are inflammatory foods, however, only one participant (33.3%) strongly agreed to the statement that diet deters cardiovascular health (see Figure 3).



Post educational intervention completion, an increase in the belief that inflammatory diets and atherosclerosis increasing heart disease risk by impacting the heart lining, and healthy lifestyle preventing 80% of heart disease cases increased with 66.7% (*n*=4) now strongly agreeing. Participant post-test responses remained unchanged from the pre-test towards identifying red meat, refined sugar and processed carbs as inflammatory foods, and diet deterring cardiovascular health (see Figure 4).



Survey Section 3 Results

The third section of the pre and post-test assessed participant knowledge on the MD and it's effect on heart disease. Before completing the educational intervention, 50% (*n*=3) strongly agreed to the MD being known for its anti-inflammatory properties and inclusion of omega-3 fatty acids. Four out of six (66.7%) of participants also strongly agreed the MD consists of vegetables, fruits, whole grains, and healthy fat. All participants believed in limiting red meat to prevent heart disease as 50% (*n*=3) strongly agreed and 50% (*n*=3) agreed. While only one participant (16.7%) found alcohol to be a risk-free beverage on the MD, 50% (*n*=3) of participants strongly disagreed to alcohol being risk-free (see Figure 5).

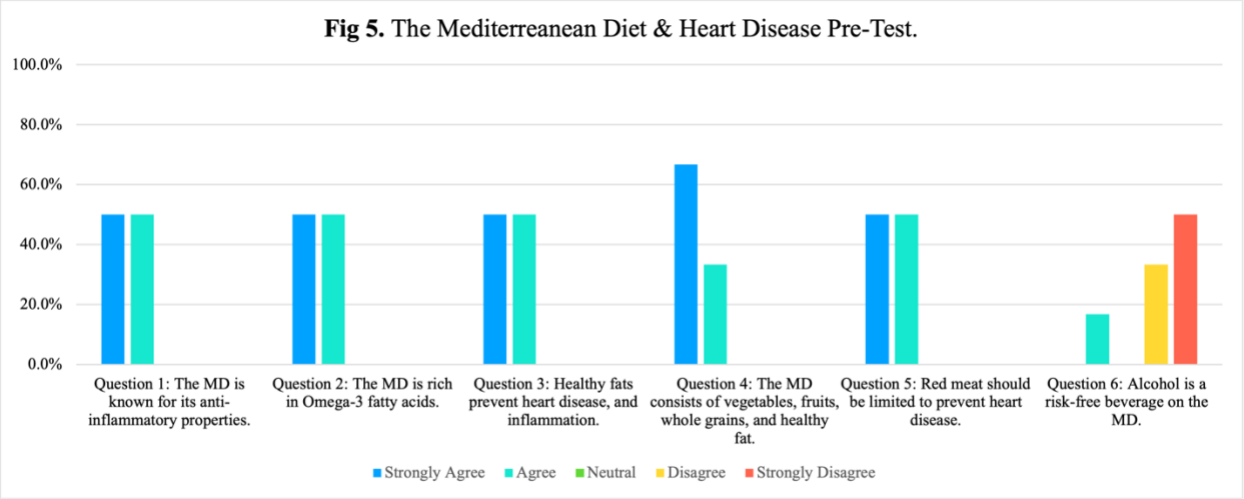
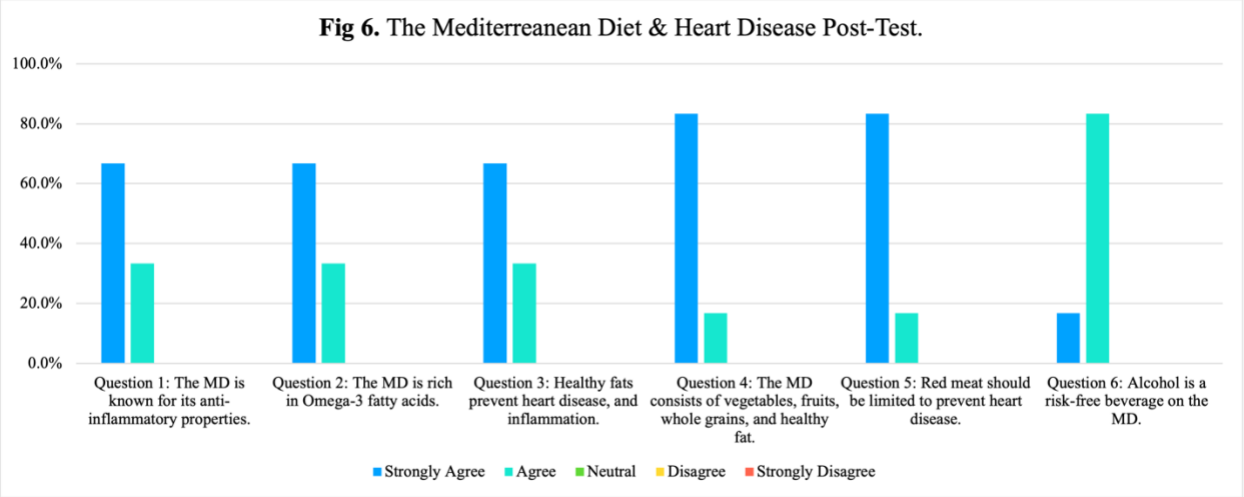


Fig 5. The Mediterreanean Diet & Heart Disease Pre-Test.

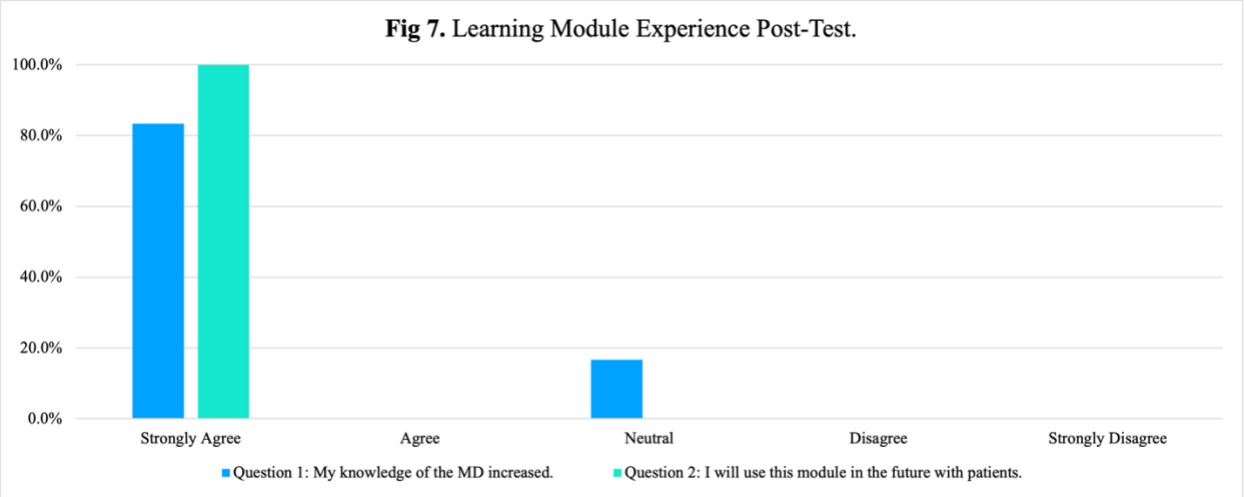
Once participants completed the educational intervention, belief that the MD is anti-inflammatory, and rich in omega-3 fatty acids preventing inflammation and heart disease increased from 50% (*n*=3) to 66.7% (*n*=4) strongly agreeing. The majority (83.3%, *n*=5) of participants strongly agreed to the MD consisting of vegetables, fruits, whole grains, and healthy fat as well as limiting red meat to prevent heart disease. Participant belief in alcohol being a risk-

free beverage on the MD also changed with 83.3% (*n*=5) now agreeing to the statement compared to 50% (*n*=3) of participants strongly disagreeing in the pre-test (see Figure 6).



Survey Section 4 Results

The participant's experience of completing the educational intervention was assessed in Section 4 of the post-test. While 83.3% (*n*=5) strongly agreed their knowledge on the MD increased, all participants (100%, *n*=6) agreed they will use the intervention in the future when treating heart patients with heart disease(see Figure 7).



Discussion

The data demonstrates a positive trend in increasing MD knowledge after completion of an evidence-based educational intervention. After completing the educational intervention, participants demonstrated an increasing agreement with the importance of diet and its impact on heart disease. Based on these results, the intervention demonstrated the potential to improve heart disease and MD knowledge in healthcare professionals. The education material provided in the intervention allowed participants to increase their knowledge and understand the strong role inflammation plays in the development of heart disease. With providers having improved knowledge regarding this relationship, and the known reduction in oxidative stress and heart disease diagnoses found in the literature, it can be inferred that implementation of the teaching points within the educational tool can positively impact the outcomes of patients with heart disease ~~patients~~ (Guasch-Ferré & Willett, 2021; Harvard School of Public Health, 2022; Stumpf et al., 2023).

With the increase in knowledge regarding the role anti-inflammatory foods play in reducing and managing heart disease symptoms through the diet plan and sample menus provided in the educational intervention, providers also now have tangible educational material to provide their patients. In knowing the high amount of antioxidants and polyphenols included in the MD, patient use of the diet guides may encourage inflammation reduction to promote a decrease in disease processes (Martínez-González et al., 2019; Guasch-Ferré & Willett, 2021).

Practice Implications

Practice implications do exist with the evidence-based educational intervention as proper facilitation, distribution, and use of knowledge with patients is not something that can be continuously measured or managed. While providers can increase their knowledge on the positive effects the MD can have in the prevention and management of heart disease, the

importance of passing on the knowledge to patients and using the educational intervention also as a patient education intervention must be continued. Due to the results of this study, the educational intervention shows promise towards increasing knowledge. While this intervention provides individuals a physical reference to use when educating and applying the MD, continued use and spread of the educational intervention must be done to further knowledge production.

With the promise this educational intervention has shown in educating individuals, healthcare providers can pass it on to patients in practice with a heart disease diagnosis to educate patients on the MD. Once patients have completed the educational intervention, they can then apply the information provided to make modifications to their diets. Healthcare providers can then monitor their symptoms to see how reducing inflammation with the MD is impacting their heart disease. Through the evidence seen both in the literature and through this study, the potential to manage heart disease symptoms by increasing knowledge through this educational intervention is encouraging (AHA, 2023; Alfaddagh et al., 2020; Juul et al., 2021; Li et al., 2020; Martínez-González et al., 2019; Richardson et al., 2022; Sorriento & Iaccarino, 2019).

Limitations

This study does have limitations due to its small sample size (n=6) with participants from the same medical practice. While the sample was composed of licensed medical professionals, broadening the sample size across several practices with a larger number of medical providers could change the results. All participants in this study see patients from a similar demographic, therefore, a different outcome could be seen when diversifying practice location and patient demographics.

Based on these limitations, the effectiveness of this educational intervention is still unknown as it has only been used in one medical setting on one group of medical professionals. Further testing and implementation of the intervention must be completed to determine effectiveness in practice.

Conclusion

With an increase in heart disease related deaths rapidly increasing, the need for intervention to mitigate the development of disease is pivotal within society. The positive correlation between chronic inflammation and disease progression has illustrated how diet can influence a heart disease diagnosis. Through the anti-inflammatory benefits of the MD supported in the literature, a tangible educational intervention has been provided that can be implemented into an individual's lifestyle to prevent and reduce heart disease symptoms. Providers must continue to educate patients about the MD to promote the benefits associated with anti-inflammatory diets. Further studies on patient implementation and adherence would be beneficial in the future to further test the efficacy and reliability of this educational intervention, and the sustainability of the MD amongst patients with heart disease.

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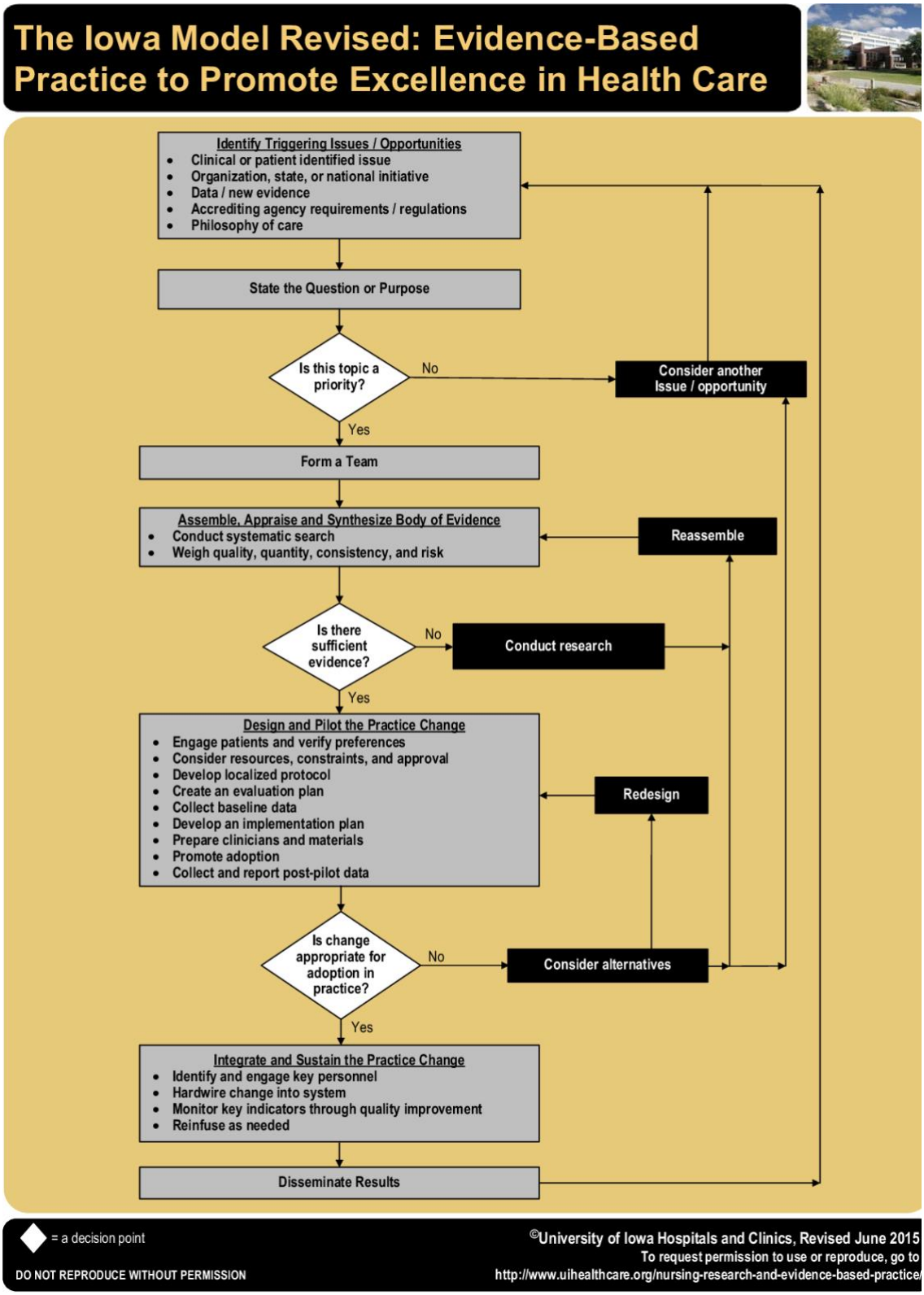
Appendix A



(Iowa Model Collaborative, 2017)

Appendix B

UMassAmherst

Human Research Protection Office

Mass Venture Center
100 Venture Way, Suite 116
Hadley, MA 01035
Telephone: 413-545-3428

Memorandum – Not Human Subjects Research Determination

Date: August 8, 2024

To: Alexa De Villier Charlotte De Villier, College of Nursing

Project Title: *The Mediterranean Diet & Heart Disease: Measuring Knowledge Through Provider Education*

HRPO Determination Number: 5825

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination based on the information provided to our office:

☐ The proposed project does not involve research that obtains information about living individuals [45 CFR 46.102(f)].

☐ The proposed project does not involve intervention or interaction with individuals OR does not use identifiable private information [45 CFR 46.102(f)(1), (2)].

☒ The proposed project does not meet the definition of human subject research under federal regulations [45 CFR 46.102(d)].

Submission of an Application to UMass Amherst IRB is not required.

Note: This determination applies only to the activities described in the submission. If there are changes to the activities described in this submission, please submit a new determination form to the HRPO prior to initiating any changes. ***Researchers should NOT include contact information for the UMass Amherst IRB on any project materials.***

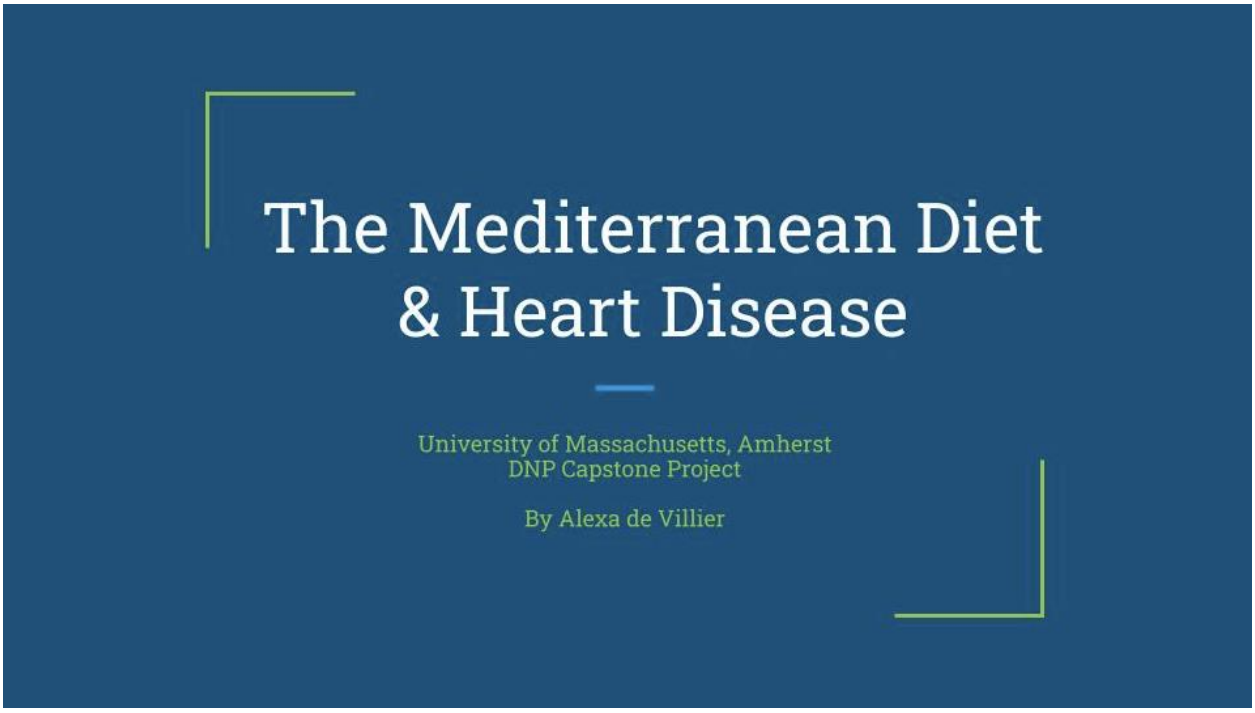
A project determined as "Not Human Subjects Research," must still be conducted ethically. The UMass Amherst HRPO strongly expects project personnel to:

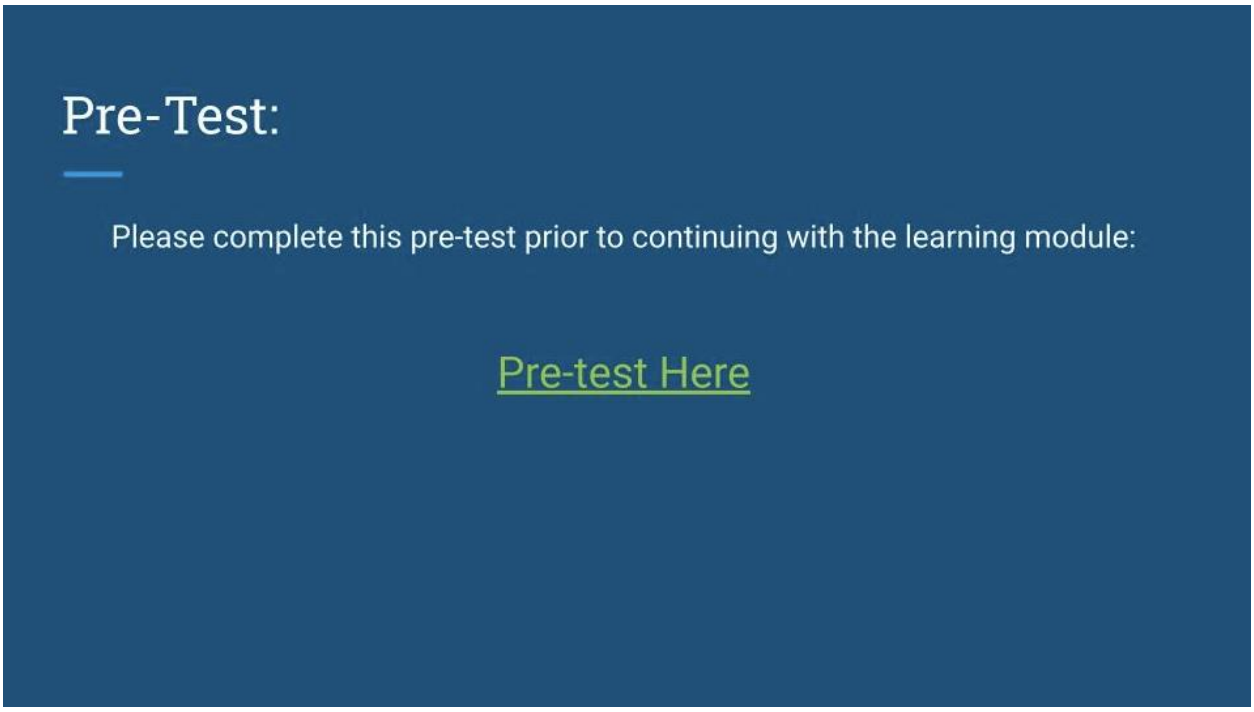
- treat participants with respect at all times
- ensure project participation is voluntary and confidentiality is maintained (when applicable)
- minimize any risks associated with participation in the project
- conduct the project in compliance with all applicable federal, state, and local regulations as well as UMass Amherst Policies and procedures which may include obtaining approval of your activities from other institutions or entities.

Please do not hesitate to call us at 413-545-3428 or email humansubjects@ora.umass.edu if you have any questions.

Jorge A. Guzman, Assistant Director
Human Research Protection Office

Appendix C


The Mediterranean Diet
& Heart Disease
University of Massachusetts, Amherst
DNP Capstone Project
By Alexa de Villier


Pre-Test:
Please complete this pre-test prior to continuing with the learning module:
Pre-test Here

Heart Disease & Inflammation

- Heart disease is known as the leading cause of death within the United States.
- The development of heart disease secondary to chronic inflammation within the body has become a pivotal area of concern worldwide with the increase in the diagnosis of heart disease in adults.
- Inflammation is a physiological response within the body used to protect individuals from harmful pathogens such as infections, however, when inflammation becomes chronic, the body is placed at a higher risk for developing chronic illness
- Chronic inflammation can effect the lining of the heart, veins, and arteries. It can also cause atheroslecrois, or chronic vascular inflammation.

Heart Disease & Inflammation (cont.):

- Inflammation is a physiological response within the body used to protect individuals from harmful pathogens such as infections, however, when inflammation becomes chronic, the body is placed at a higher risk for developing chronic illness
- Chronic inflammation can affect the lining of the heart, veins, and arteries. It can also cause atherosclerosis, or chronic vascular inflammation.

Heart Disease & Inflammation (cont.):

- Inflammation is a physiological response within the body used to protect individuals from harmful pathogens such as infections, however, when inflammation becomes chronic, the body is placed at a higher risk for developing chronic illness
- Chronic inflammation can affect the lining of the heart, veins, and arteries. It can also cause atherosclerosis, or chronic vascular inflammation.

Anti-Inflammatory Diets for Heart Disease Prevention & Symptom Management:

- Knowing that pro-inflammatory foods can lead to heart disease development, the implementation of an anti-inflammatory diet can reduce risk factors for heart disease as well as reduce symptoms in those with a pre existing diagnosis.
- Specifically, The Mediterranean Diet (MD) has been recommended by the American Heart Association (AHA) to reduce inflammation and treat heart disease.

Benefits of The Mediterranean Diet:

- The MD diet has been found to increase life expectancy by 8-13 years.
- Helps the body regulate to a healthy weight.
- Supports healthy blood sugar, blood pressure, and cholesterol levels.
- Supports a healthy gut microbiome.
- Slows brain function decline.
- Lowers metabolic syndrome risk.

The MD has these benefits due to it limiting sans/trans fats, sodium, and refined sugar. It also is abundant in high fiber foods and antioxidants.

The Mediterranean Diet: What To Eat

The MD is a way of eating rather than a specific diet that mimics how individuals within Mediterranean countries eat. This includes a diet full of fruits, vegetables, beans, whole grains, healthy fats, and lean proteins.

Foods included in the MD:

- All Fruits & Vegetables
- Whole grains (whole grain pasta, brown rice, quinoa, oatmeal)
- Leafy greens (spinach, kale, arugula, swiss chard ect.)
- Beans/Legumes (lentils, chickpeas, kidney beans)
- Omega-3 Rich Fish (Salmon, swordfish, tuna)
- Lean meats (fish, chicken, turkey, limit red meat)
- Olive Oil
- Nuts/seeds
- Avocado
- Greek Yogurt, Whole milk, Full fat cheese

The Mediterranean Diet: What Not To Eat

Foods excluded from the MD:

- Processed sugar (desserts, ice cream, candy, table sugar, syrup ect.)
- Refined grains (white bread, white rice, flour tortillas)
- Processed carbs (crackers, chips, cereal, granola bars, microwave popcorn)
- Processed meat (sausage, deli meat, hot dogs, beef jerky)
- Trans fats (margarine, vegetable oil, fried foods)
- Juices & Soda
- Alcohol

How can the MD be brought into practice?

- The MD can be brought into practice through patient education, and providing resources on what foods are included in the MD.
- An MD Diet food list, such as the one linked below, could be given to patients, as well as education on proper food portions so they know how to build their meals.

Complete MD Food List

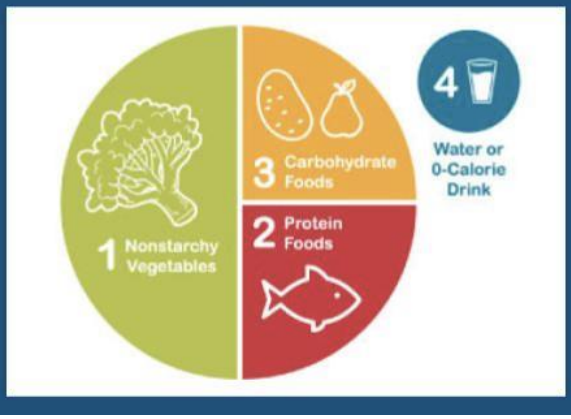
(Hyperlink content included in previous slide)

How to Build a Plate with the MD:

- In order to help patients see the MD as a realistic way of eating within their everyday life, "The New American Plate" plating method, created by the American Institute for Cancer Research, can be taught to patients to make creating a meal with a new diet easier and more attainable.
- "The New American Plate" emphasizes half of a plate being non-starchy vegetables, a quarter of the plate being 4-6 oz. of protein, and the remaining quarter to be a fiber-rich carbohydrate. This could also be built into meals such as a sandwich that has vegetables, protein, and whole grain bread.

How to Build a Plate with the MD (cont.):

This image is a helpful visual of the plating method to aid patients in transitioning to the MD more easily.



The Mediterranean Diet: Sample Menu

Breakfast:	Lunch:	Dinner:	Snacks:
• Greek yogurt with berries • Scrambled eggs with spinach • Coffee (can add milk)	• Whole grain wrap with grilled chicken, hummus, and vegetables • Fruit of choice	• Grilled salmon with vegetable • Baked sweet potato • Side salad with olive oil and vinegar	• Handful of almonds • Carrot sticks with hummus • Apple with all natural peanut butter

Post-Test:

Please complete this post-test to conclude the learning module.

Post-Test Here

References

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Appendix D

The Mediterranean Diet and Heart Disease Pretest

Age:
Medical Provider Title:
Years of Experience as Medical Professional:

Section 1: Personal Stance On Diet and Heart Disease

1: Diet is just as important in treating heart disease as medication.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

2: I follow my patient's diet when treating them for heart disease.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

3: Heart disease symptoms can be reduced by improving diet.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

4: Patient's are willing to change their diet when diagnosed with heart disease.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

5: Most patients diagnosed with heart disease are overweight.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Section 2: Pro-inflammatory Diets and Heart Disease

6: Pro-inflammatory diets increase risk for heart attack, and coronary heart disease.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

7: Inflammation can affect the lining of your heart or valves, the heart muscle, or the tissue around the heart.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

8: Pro-inflammatory foods include processed meat, refined carbohydrates, ultra-processed foods, and sugary beverages such as soda.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

9: Atherosclerosis, a chronic form of vascular inflammation, is a main contributor to the development of heart disease.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

10: Diet is considered a main deterrent of cardiovascular health.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

11: Following a healthy lifestyle can prevent up to 80% of heart disease cases.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Section 3: The Mediterranean diet (MD)

12: The MD is the most studied and well known diet in the world due to its anti-inflammatory properties.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

13: The MD is rich in Omega-3 fatty acids which reduce inflammation.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

14: Healthy fats play a vital role in preventing heart disease, and prevent inflammation.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

15: The MD consists of vegetables, fruits, whole grains, beans, nuts/seeds, olive oil, and herbs.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

16: Red meat should be limited to prevent or lessen the symptoms of heart disease.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

17: Alcohol is a risk-free beverage on the MD.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Appendix E

The Mediterranean Diet and Heart Disease Posttest

Name:

Section 1: Personal Stance on Diet and Heart Disease

1: Diet is just as important in treating heart disease as medication.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

2: I follow my patient's diet when treating them for heart disease.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

3: Heart disease symptoms can be reduced by improving diet.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

4: Patients are willing to change their diet when diagnosed with heart disease.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

5: Most patients diagnosed with heart disease are overweight.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

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8: Pro-inflammatory foods include processed meat, refined carbohydrates, ultra-processed foods, and sugary beverages such as soda.

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- Disagree
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- Disagree
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- Agree
- Neutral
- Disagree
- Strongly Disagree

17: Alcohol is a risk-free beverage on the MD.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Section 4: Educational Intervention Experience (Post-Test Only)

18: This educational intervention increased my knowledge on The Mediterranean Diet.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

19: I will use this educational intervention and/or the information from this intervention in practice when working with heart disease patients.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree