Promoting Cardiovascular Health: Addressing Barriers to Implementing the Mediterranean Diet

By

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Abstract

Cardiovascular disease (CVD) is the leading cause of death in the United States, and cardiovascular events are reduced and prevented when patients follow the Mediterranean diet (MedDiet). Current literature demonstrated barriers in patients ability to adapt to the MedDiet intervention. Therefore, this applied project addressed the literature gap by developing and introducing education materials addressing these barriers to strengthen the impact of dietary intervention related to CVD. This project incorporated the researcher and experts' clinical experience in CVD prevention and cooking and dietary intervention. Suggestions from these experts led to modifications in the educational video created by the researcher. This educational video is a starting point to provide foundational knowledge to patients with CVD. A total of ten medical professionals analyzed the applied project intervention video and were surveyed regarding video clarity, professionalism, the relevance of information, and appeal. The average score of the video was 4 out of 5 stars. Studies indicated that familiarity with the MedDiet is closely associated with adherence. An introductory education video used to better familiarize patients with MedDiet recipes may improve patients' eating habits and in turn, reduce the risk of cardiac events.

Keywords: Cardiovascular disease, Mediterranean diet, dietary adherence, dietary education, health behavior change, management, prevention, implementation, primary health care

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Introduction

Cardiovascular disease (CVD) is the leading cause of death worldwide (Dehghan et al., 2018). In the United States, 610,000 deaths per year are associated with CVD (Mozafarian et al., 2016). The costs associated with CVD care in the U.S. are estimated to be 17% of the overall national health care expenditures, with an estimated annual health care cost per individual of $18,953 (Nichols et al., 2010). The occurrence of CVD in younger patients has been attributed to an enormous burden of risk factors, most notably obesity (Aggarwal et al., 2018). CVD has a substantial effect on people's physical and financial health in the United States, and these effects support the urgent need for improvements in CVD care and prevention (Greiner et al., 2019).

Substantial scientific evidence supported that dietary improvements using the Mediterranean diet (MedDiet) could reduce the risk of CVD and cardiac events (Estruch et al., 2018). Numerous prospective cohort studies, and some clinical trials, have exponentially increased the level and the quality of scientific evidence related to the positive effects of the MedDiet on CVD (Aggarwal et al., 2018). The research has demonstrated that both incidence and mortality from CVD can be prevented with good dietary choices and healthy lifestyles (Aggarwal et al., 2018). A recent comprehensive meta-analysis on MedDiet and CVD showed that participants with the highest adherence to the MedDiet had a 24% lower incidence and mortality from CVD compared to those who were less adherent (Grosso et al., 2017).

Without question, a balanced diet, in terms of both quantity and quality, represents a key factor for the optimal prevention of CVD. Ideally, this relatively simple, cost-effective step could alleviate CVD deaths (Schroeder, 2007). However, about half of individuals with chronic heart illnesses, such as CVD, encounter barriers in making and maintaining their dietary modifications (Estruch et al., 2018). The success of cardiac health rests critically on individuals' food choices,

yet one question remains: why are healthcare providers continuing to fail at supporting their patients in critical dietary changes?

Significance to Nursing and Health Care Leadership

Ideally, patients are educated about CVD risk and prevention during wellness checkups with a primary care provider. However, the increasing rates of CVD within the United States demonstrated that more interventions are needed (Grosso et al., 2017). The leading health organization in heart diseases and stroke, the American Heart Association (AHA), has taken significant steps to promote preventative measures and interventions. The AHA (2021) program entitled *8 Steps to Prevent Heart Disease* includes the importance of individuals' knowing their risk factors, being physically active, and eating a healthy diet, which was described as an eating plan centered around vegetables, fruits, whole grains, legumes, nuts, plant-based proteins, lean animal meats and fish. One healthy diet option that fits these characteristics, and can be relatively low cost and easy to implement, is the MedDiet (Logan et alk., 2010). However, support for patients and families to integrate the MedDiet, or other heart healthy options, into their daily lives has not translated into widespread health behavior change (McEvoy et alk., 2018).

Barriers in practicing MedDiet recommendations existed despite the education efforts by health care professionals to their patients (Aggarwal et al., 2018). Patients may not have access to supplemental and additional educational materials related to the MedDiet (Jonsson et al., 2020). Other patient factors include lack of interest in the MedDiet, reluctance to change their lifestyles, patient depression, living in rural settings, and lack of family support (Jolly et al., 2007). Many myths and predisposed ideas around healthy eating can also create conflicting beliefs, and changes in dietary patterns related to health have confused patients (Nieuwlaat et al., 2013). Even when there is mutual understanding and agreement between the healthcare provider

and patient, little education is conducted on the fundamentals of what a healthy diet should include. With shorter outpatient appointment times, it has become more difficult for healthcare providers to adequately teach patients about heart-healthy diets. Furthermore, less information is retained during health care appointments if a large influx of information is being presented (Jonsson et al., 2020).

Nevertheless, providing patients and their families with education is the most critical way to combat the consequences of CVD (Lyod-Jones et al., 2010). Most CVD deaths are preventable with lifestyle modification and diet adherence (Kandel, Sean. 2018). For this project, an educational video introducing two recipes and representing a MedDiet was created. The creation and dissemination of the video will be discussed in the following sections.

Literature Review

Many diets have been studied for their impact on heart health. In the literature, the most conclusively beneficial diets are the MedDiet and the Dietary Approaches to Stop Hypertension (DASH) diet (Serra-Majem et al., 2006). These diets are rich in fiber, vitamins, and minerals that help lower blood pressure and LDL cholesterol and reduce the risk of diabetes (Lloyd-James et alk., 2010). However, the most recommended diet for helping to maintain a healthy weight and lowering the risk of heart disease is the MedDiet (Dinu et al., 2017). The purpose of this literature review is to identify and explore barriers to patient adoption of MedDiet recommendations despite the evidence demonstrating its cardiac health benefits.

A number of studies have determined that higher adherence to the MedDiet is associated with reduced risk of CVD deaths (Greenland et al., 2001; Kris-Etherton et al., 2001; Cohn et al., 2003; Anker, 2004; Jolly et al., 2007; Stefler et al., 2015; Shan et al., 2020). Cardiovascular events are reduced and even prevented when patients follow the MedDiet (Martinez-Gonzalez et al., 2016). Themes were determined from the review of the literature that suggest why the

MedDiet and its recommended practices are not followed. These themes include: (a) efficacy of the Mediterranean diet, (b) current recommendations, (c) misperceptions of MedDiet, (d) perceptions of a healthy diet, (e) the convenience of available foods, and (f) lack of education (Meng et al., 2014; Aggarwal et al., 2018, Greiner et al., 2019, Jonsson et al., 2020, Wartak et al., 2011, Kohler et at., 2020, Bememlmans et al., 2000). Each of these is discussed below.

Background

The term "Mediterranean diet" was coined by a specialist in biology and animal physiology named Ancel Keys (Wright, 2011). Keys studied data on morbidity and mortality in post-war Europe when he was surprised to notice a significant drop in acute coronary attacks in certain countries. At the same time, Keys was aware of the high rates of heart attacks in middle-aged businessmen in the United States and came to suspect that diet may be related to the risk of CVD (Wright, 2011). In 1951, Keys went to Naples and opened a portable laboratory where he was soon able to confirm the low incidence of CVD. When Keys first presented his diet theory on the cause of heart disease at the World Health Organization (WHO) in 1955, he was met with skepticism and even challenged by a world-famous cardiologist (Wright, 2011). Using this opposition as motivation, Keys designed and implemented the *Seven Countries Study* (Aboul-Enein et al., 2017). When this study's medical data were submitted for statistical analysis, the results showed significant differences between geographical areas. The lowest rates in heart attack incidences were found in Crete, Japan, and Corfu (Wright, 2011). At the other end of the spectrum, the highest rates were identified in Finland followed by the United States coming second (Keys, 1980).

Efficacy of the Mediterranean Diet

In the following years, confirmation of the cardiovascular benefits of the MedDiet became more robust. One recent large trial that provided strong evidence in favor of the MedDiet

was the Spanish Prevención con Dieta Mediterránea (PREDIMED) study (Martinez-Gonzalez et al., 2016). Designed as a primary prevention randomized controlled trial (RCT), 7,447 subjects were enrolled with no clinical signs of CVD in either a control group advised to follow a low-fat diet or two active experimental groups which were set to follow a MedDiet supplemented with extra-virgin olive oil or mixed nuts (Estruch et al., 2018). All three groups were heart-healthy and displayed benefits. However, the groups randomized to the MedDiet displayed a 30% reduction in the risk of cardiovascular complications, with an impressive 40% reduction in stroke risk (Estruch et al., 2018). The original PREDIMED paper was retracted and replaced with a re-analysis that treated the study as a non-randomised study and excluded participants who were not truly randomised (Estruch et al., 2018). The re-analysis resulted in similar point estimates for the primary endpoint. Additionally, separate studies confirmed that adherence to the MedDiet was associated with favorable weight changes and a reduced incidence of obesity (Beunza et al., 2010).

The Lyon Diet Heart Study was a secondary prevention RCT performed to assess the effects of a modern, French-adapted version of the MedDiet in patients who had already suffered a cardiac event (Kris-Etherton et al., 2001). The Lyon Diet Heart Study results showed not just a 50% reduction of new coronary events but also a reduction in the number of new cancer cases and all-cause mortality (Kris-Etherton et al., 2001). The health benefits of the Mediterranean eating style could not be overlooked anymore, and the concept of the MedDiet entered the medical consciousness.

Stemming from the Lyon Diet Heart Study, the EPIC study was a large-scale cohort study in 10 European countries, including 521,468 adults followed over 15 years for various cancer, cardiovascular, metabolic, neurological, and nutritional outcomes (Dinu et al., 2017). After a four-year follow-up, the MedDiet Score was associated with a 33% reduction in

cardiovascular death (EPIC study, 2021). Research is still ongoing in multiple working groups, but further publications are expected to shed light on pathways linking nutrition to various diseases plaguing global populations today.

Misperceptions of the Mediterranean Diet

In *The Big Fat Surprise*, Nina Teicholz (2014) claimed that little evidence existed on the health benefits of the MedDiet. She asserted the diet was promoted by olive oil companies and their ambassadors. Stating "sloppy science" to blame for the hype, Teicholz wrote that the MedDiet had no impact on overall mortality or weight loss and the studies are flawed and "cherry-picked" (p. #). While *The Big Fat Surprise* was popular and widely popular, in late 2017, *The Lancet* reviewed the book and praised it as a novel, which further confused consumers. Many respected MDs and RDs have spoken out against *The Big Fat Surprise*. In particular, Dr. Joel Kahn, a leading cardiologist, lecturer, and author on topics such as how to reverse heart disease, stated in an interview, "I always recommend the Mediterranean diet as a healthy substitute for the standard Western diet, which is overloaded with processed calories and excess refined sugar, salt, and vegetable oils" (Kahn, 2018).

Another claim against the MedDiet is that it does not work outside of the Mediterranean (Martinez-Gonzalez et al., 2017). While many foods are specific to the Mediterranean region, most of these foods are easy to find here in the U.S. (McEvoy et al., 2018). *The Journal of Human Nutrition and Dietetics* published an implemented RCT of 120 participants in the U.S. involving telephone counseling (McEvoy et al., 20018). In the study, the MedDiet had ten dietary goals targeting increases in monounsaturated fats, whole grains, and the amount and variety of fruits and vegetables consumed daily. Although subjects took more time to achieve the MedDiet goals than the study’s opposing diet, the diet's ingredients were readily available. Also noted in this study, was that ongoing counseling for the MedDiet was useful for improving diet

quality and achieving a modest weight loss in overweight or obese individuals (Sidahmed et al., 2013).

Another misperception is that the MedDiet is too high in fat (Davis et al., 2015). However, the fats that are common in the MedDiet are not associated with weight gain or poor health (Mitrou et al., 2007). One randomized study showed that the fats found commonly in the MedDiet make improvements to heart health (Martinez-Gonzalez et al., 2018). In a survey of 288 participants, there were 96 events in the group assigned to a MedDiet with extra-virgin olive oil (3.8%), 83 in the group set to a MedDiet with nuts (3.4%), and 109 in the control group (4.4%) (Estruch et al., 2018). The study results showed that for persons with a high cardiovascular risk, the incidence of major cardiovascular events was lower among those assigned to a MedDiet supplemented with extra-virgin olive oil or nuts than those set to a reduced-fat diet (Estruch et al, 2010).

Current Recommendations

Current dietary guidelines recommended a dietary pattern approach for reducing chronic disease risks (Nieuwlaat et al., 2013). These eating patterns are consistent with the MedDiet and the DASH diets. DASH has been promoted for more than 20 years (Folsom et al., 2007). Although DASH is effective in lowering blood pressure, the evidence is less strong for its ability to reduce nutritional-related diseases, such as CVD (Richter et al., 2017). Some studies on the DASH diet show a decrease of some cardiovascular risk factors (such as blood pressure), but it may also reduce cardioprotective factors, such as lowering HDL cholesterol and raising triglyceride levels (Folsom et al., 2007). Further, it does seem difficult for patients to adhere to the DASH diet; although, the factors that impact DASH adherence may also impact MedDiet adherence.

Both the DASH diet and the MedDiet have been shown to decrease risk factors that could lead to hypertension, obesity, and diabetes (Appel et al ., 2006). The MedDiet, with its various interpretations, has several features distinct from the DASH diet: the almost exclusive use of olive oil as the primary fat, high consumption of fish, and moderate consumption of wines with meals (Estruch et al, 2013). The DASH diet specifies low consumption of saturated fats and commercial pastries and sweets, and higher consumption of dairy than in the Mediterranean pattern (Folsom et al., 2007). Overall, the evidence for the MedDiet is considered by some to be stronger than for the DASH diet (Richter et al., 2017). Further, there is a more substantial evidence base concluding the reduced risk of CVD in addition to many chronic diseases when individuals adhere to the DASH diet (Richter et al., 2017).

Perceptions of a Healthy Diet

What constitutes a healthy diet has created confusion among medical professionals and society (Haskell, 2003). Unfortunately, many studies focus on just one aspect of healthy dietary practices, but nutrition is complicated and cannot be defined by just one element. Over the years, varying diet recommendations have created mistrust. A perfect scientific study would randomly assign large groups of people to eat different, carefully controlled diets over a long period of time, and then follow their health outcomes. But people do not just eat to fuel the body; sharing food and drinks socially with family and friends has been ingrained in human cultures across the globe (Nieuwlaat et al., 2013).

Nevertheless, there is an understandable frustration when people feel they have been following nutritional guidelines but still have health problems. One example is the rise in obesity. A recent study from the *New England Journal of Medicine* predicted that 1 in 2 Americans will be considered obese by 2030 and 1 in 4 Americans are projected to be severely obese, demonstrating that the most damaging characteristic of the American diet has persisted

throughout the years – abundance (Ward et al., 2014). According to a 2010 US Department of Agriculture (USDA) study, meat, eggs, and nuts make up 21% of the American population's diets, dairy products make up 9%, flour and cereal products are 24%, added fats and oils are 23%, and caloric sweeteners are 14% (McEvoy et al., 2018). The long-term impact of eating such foods has led to nearly half of all American adults having one or more chronic diseases related to low-quality diet (Richter et al., 2017).

The Convenience of Available Foods

In general, Americans consume the least nutrient-dense forms of basic food groups and instead consume foods that are high in solid fats and added sugars, such as sweetened beverages, grain-based desserts, dairy products, and fatty meats (Wilson et al., 2016). Over the last decade, these processed foods have become commonplace within the American culture. The rapidly changing food system seen with the development of technology, where food goals focused more on mass quantities and movement to all corners of our country than health, changed the American food system (Wilson et al., 2016). The quantity of crops (soybeans, corn, and wheat) over quality, increased processed foods, and dramatically increased the content of fat, sugar, and calories in the average diet (Ward et al., 2012). Those shifts, coupled with the movement of more women into the workforce, created a demand for convenient food options (wilson et alk., 2016). From 1966 to 1999, the average time an adult (aged 25-54) spent cooking decreased 25%, with a 43% decrease among women (Kearns et al., 2016).

Industrialization has driven down the cost of food, but when it comes to the mass production and consumption of food, these decisions are driven by economics and not science, common sense, nor health (Nestle, 2017). The American diet quality has certainly varied; however, one thing has remained the same: processed foods are significant sources of salt, fat,

and sugars in the U.S. diet because these ingredients contribute to the taste, mouthfeel, and shelf life of foods (Bachman et al., 2008).

Culturally, the United States as a whole lacks an overall healthy dietary lifestyle, which has contributed to diet-related chronic diseases (Ward et al., 2014). With 170,000 fast-food restaurants and 3 million soft-drink vending machines spread across the country, a vast amount of calories are never far away (Nieuwlaat et al., 2013). A roundtable discussion article published in the *Journal of Clinical Lipidology* revealed that 32% of Americans' total daily calories are eaten away from home (Brown et al., 2015). The choices for eating out frequently include highly processed foods and animal products, two high-risk ingredients for health. In 2018, the Food and Drug Administration (FDA) reported that high levels of partially hydrogenated oils (PHOs) and LDL cholesterol should be used minimally to decrease heart disease risk (Lloyd-Jones et al., 2010), but both elements are frequently found within highly processed foods and animal products. The 2015–2020 Dietary Guidelines for Americans stated that about three-fourths of the population followed an unhealthy eating pattern (Health People., 2021). Further, half of the population was at the limit or exceeding total refined grains and unhealthy protein sources (Wilson et al., 2016).

Education

The MedDiet is one of the most recommended evidence-based diets and may help individuals achieve better long-term, optimal CVD risk levels (Serra-Majem et al., 2006). A traditional MedDiet is characterized by a high intake of olive oil, fruits, nuts, vegetables, and cereals; a moderate intake of fish and poultry; a low intake of dairy, red meat, processed meats, and sweets; and wine in moderation (Willett et al., 1995). Adaptations to the Mediterranean eating style and search for related cardiovascular benefits exist today far beyond the Mediterranean region's borders (McEvoy et al., 2018). Two cohort studies in the United States

confirmed significant reductions in the rate of cardiovascular events where the American population had higher adherence rates to the Mediterranean diet (Mitrou et al., 2007).

The U.S. federal government provided recommendations for optimal diet quality through the Dietary Guidelines for Americans and set benchmarks for these recommendations through the Healthy People objectives. The Healthy People 2030 committee recommended the following Impact Goals: "By 2030, to improve the cardiovascular health of all Americans by 20% while reducing deaths from cardiovascular diseases and stroke by 20%" (Healthy People 2030, 2021). Unfortunately, diet quality is not improving quickly enough to meet all of the Healthy People 2020 objectives. Whole fruit and empty calories are the only HEI-2010 components on track to have met the respective Healthy People 2020 targets (Wilson et al., 2016). The Population Urban Rural Epidemiology (PURE) showed that in high-income countries, only half of the patients with known coronary artery disease were using three or more recommended therapies five years after the cardiac event, and 50–75% of patients with known CVD were not using even one recommended medication (Yusuf et al., 2011). Studies also indicated that half of those who remain on medication are not adherent and fewer persons at high risk for another event receive proven and safe therapies for CVD treatment and prevention (Nieuwlaat et al., 2013).

About half of individuals with chronic illnesses, such as CVD, who make a health behavior change fail to maintain it (Dinu et al., 2017). The main challenge regarding the implementation of best practice is applying proven therapies for the appropriate patients. Some studies supported positive change when education is highly utilized. In a 20-year dietary counseling study in Finland, 507 participants were randomly assigned to either an intervention or control group (Pahkala et al., 2020). The intervention introduced participants to a heart-healthy diet, characterized by a low proportional intake of saturated fat and cholesterol, dietary counseling, and nutrition education sessions to parents and children from seven months to 20

years. This study concluded that dietary counseling was introduced and continued to benefit diet quality and cardiometabolic risk factor levels (Pahkala et al., 2020).

Supporting the transition and maintenance of a healthy diet, such as the MedDiet, which has been shown to effectively reduce the risk of disease, should be a high public health priority for CVD prevention. A study conducted on 337 participants, 48.7% of whom were men, examined how prior knowledge of the MedDiet positively affected diet quality (Greiner et al., 2019). Patients in the high dietary adherence groups were significantly more likely to be familiar with the MedDiet, and the authors concluded that patient education, combined with prior knowledge of the MedDiet, would likely improve adherence to this diet (Serra-Majem et al., 2006).

Successful dietary changes toward a MedDiet are shown to be possible when health professionals provide patients with resource-rich interventions (Logan et al., 2010). However, these interventions can be challenging to disseminate on a broader public health scale. One solution is to involve peers in the delivery of dietary behavior change programs (McEvoy et al ., 2018). A large body of literature indicated that this type of organized peer support offers an alternative and potentially low-cost way of promoting dietary change and strengthens factors associated with successful behavior change, such as knowledge, self-efficacy, and resilience (Cohen et al., 2015).

Methods

The following section discusses the applied project methods, preparation for, and creation of the educational video. When deciding on recipes to be featured, attention was paid to emphasize certain foods associated with heart benefits, such as whole grains, a wide variety of vegetables, legumes, nuts, and healthy oils.

Definition of Terms

The following terms were used operationally in this project.

- B-roll: Additional footage recorded of the set and set design props without sound. This footage does not focus on a talking individual.
- Sound-on-Tape: Sound is recorded live during video filming. The presenters are filmed simultaneously while speaking.
- Voice Over: The voice of an unseen narrator is recorded from live filming and edited into the video footage.

Description, Goals, and Objectives of the Project

This applied project consisted of the creation of an educational video on the MedDiet. The target population was those who wish to learn about the MedDiet and enhance their efforts on heart-healthy eating habits. The graphics and educational content included within the video provide meaning for the viewer. The goal was to educate viewers on the ease of adopting such a diet, reinforce the importance of diet, and discuss its impact on health. The applied project's desired outcome was to promote educational efforts on the MedDiet to reduce the number of preventable cardiac deaths related to unhealthy eating habits and lifestyle.

Protection of Human Subjects

This applied project solicited expert consultation and feedback regarding an educational video to introduce the Mediterranean diet to CVD patients. This was not a research project, and the Institutional Review Board (IRB) advised that such expert consultation does not constitute human subjects research.

Identification and Review of Existing Resources

Four existing MedDiet educational brochures were identified and collected within the community from inpatient hospital settings, clinics, and the AHA website. These brochures were

collected from February to September 2020. These were reviewed, and information was extracted from these brochures and the literature review to serve as the educational video's foundation. The quality of four educational brochures was a feasible number to achieve an assessment of valuable information.

Setting and Collaboration

Collaboration and partnership were developed with a certified dietician and registered nurses, pharmacologist at John Muir Health Walnut Creek Medical Center, and a vascular surgeon at Dignity Health Mercy San Juan Medical Center, both nationally ranked hospitals within the United States. Mercy San Juan Medical center is a 370-bed not-for-profit hospital located in Carmichael and serves the areas of north Sacramento County and south Placer County. It is home to Sacramento's first Comprehensive Stroke Center and a comprehensive cardiology program as the heart and vascular institute of greater Sacramento (Mercy San Juan Medical Center, 2020). John Muir Health Walnut Creek Medical Center is a 554-bed acute care facility designated as a level II trauma center and the only trauma center for Contra Costa County (John Muir Medical Center, Walnut Creek, 2020). It was recognized as one of the region's premier health care providers, and its areas of specialty include cardiac care, open-heart surgery, and interventional cardiology (John Muir Medical Center, Walnut Creek, 2020).

This master's student had an existing, established relationship as a nurse with both facilities. Therefore, she was already well-acquainted with the dietician, physician, and vascular surgeon. Contact information was obtained in person for review on the applied project. An email invitation was sent to the potential expert reviewers to provide them with background information on the proposed project to determine if this aligned with their professional responsibilities and whether they would be available to provide feedback and expert consultation on the educational video (see Appendix A). The experts recruited agreed to provide feedback on

the education video to make it more relevant, engaging, and motivating. A feedback questionnaire was used to solicit feedback from the reviewers (see Appendix B).

Preparation and Development

A video was created by this master's student with plans to be embedded within an educational website. The intended goal was to create a visual aid demonstrating that making recipes that encompass the MedDiet guidelines are easily achievable.

Video Content

The video includes the following content:

1. Current recommendations and practices of healthy dietary practices.
2. Background information and research conducted on the Mediterranean diet and lifestyle.
3. Instructions on how to make two heart-healthy recipes falling within the Mediterranean diet guidelines.
4. Myths about the Mediterranean Diet.
5. References and links for additional information.

The intended purpose of the video was to show the easy execution of two different Mediterranean style recipes (see Appendix C). To achieve this, limited amounts of information were included to stress the essential key points for keeping the video simple and straightforward.

Video Preparation and Development

Guy Kowarsh production company was hired for the making of the video. Mike Jensen, the Sacramento-based Jensen Wedding Films owner, L.L.C., was also hired and collaborated on the video's recording process. Microsoft Word was used to assess the reading level of the written script; the video script's reading score was determined to be at a 7th-grade reading level. An initial concept meeting was set among the Media Production Specialist and the graduate student

to discuss the script, storyboard, and overall video vision. The script was finalized for production after the concept meeting, and a date, time, and location were set for filming the video.

Filming for the video included materials such as cooking utensils, food, and prepared dishes. A chef was recruited to help prepare the food items and demonstrate the authenticity of the recipes chosen. Recipes chosen were developed by Karman Meyer, RDN, LDN. Care was taken to keep the video engaging and informative. After the video was recorded, Jensen Films edited the raw footage, sound on tape, and b-roll, and the completed link of the video was given to the graduate student. First version of the MedDIet education video was 06:45 minutes.

Results

The educational video was successfully reviewed by ten medical professionals. The reviewers provided necessary feedback to enhance the quality of the educational video.

Expert Review: Evaluation and Revision

Video feedback and comments were provided in response to the open-ended questions on the feedback-sheet (see Appendix B). Completed feedback sheets were returned via email, and recommended changes were implemented in the final version of the education video. A gift card was provided to the expert reviewers for their involvement in the project. When referring to the expert reviewers throughout this section, the following titles will be used: (1) certified dietician, (2) two cardiac registered nurses, (3) clinical resource nurse, (4) vascular surgeon, (5) pharmacologist, (6) clinical nurse educator, (7) intensive cardiac registered nurse, (8) family6 practice licensed vocational nurse, and (9) nurse practitioner.

General Feedback

Overall, the ten expert reviews provided positive feedback regarding the feedback sheet. Based on feedback, the viewers were impressed with the quality of the work within the video design, which will be discussed in the following sections. The clinical resource nurse, LVN, and

dietician mentioned concerns regarding potential limitations of patients' cooking abilities and resources. Questions were addressed, and any lack of clarification was rectified.

Recommendations

Amount of Content

All experts expressed that the information was accurate and complete. However, each expert expressed that the video in its original form was too long. Concern about viewer engagement was specifically noted regarding the length of the original cut.

Video

Questions on the feedback sheet asked the experts to identify any concerns with the video's recipe (see Appendix B). Four experts expressed the concern that certain ingredients may not be available in rural areas or if found, would be too costly. One reviewer specifically mentioned "Quinoa and kalamata olives." All of the experts believed the video's execution of recipes was delightful. The expert reviewers were asked to provide specific feedback on what to modify and add to the video created by this graduate student.

Closing Remarks

The final question on the feedback form asked if anything else needed to be changed, added, or deleted. Two out of the ten experts recommended that all recipe ingredients be listed. A few recommendations were provided: (1) create a list of ingredients on the screen or (2) create a link on the screen to direct viewers to recipe ingredients and printable shopping list of ingredients. Moving forward with the project, this master's student plans to finalize a website where viewers of the video can be directed for the recipes seen and their ingredients and a comprehensive resource library and MedDiet community.

Revisions

Cameron Scott, a Roseville-based film editor, was hired and collaborated on the video's editing process. Based on the provided feedback, the following revision was made to the video:

- The video created by the graduate student was revised. The media specialist assisted the graduate student with editing revisions: Initial video length 06:45 min, first revision 04:05 min, second and final revision 04:15 min.
- Final edits included removing the background music, removing redundant information, increasing the speed of video, editing the footage shown during the voiceover, and adding of one visual text to clarify audio.

Current Dissemination Plans

A finalized educational video prototype will be presented to the cardiology department at UC Davis Medical Center. Based upon department approval, the education video will be made available on their unit to serve as an educational tool for the patients they serve.

Discussion

Implications for Nursing

The educational video is a starting point to provide foundational knowledge to patients with high cholesterol markers or those looking to achieve optimal heart health. Nurse-provided or nurse-coordinated care management programs using multifactor approaches have been highly effective in reducing CVD morbidity and mortality of high-risk persons (Haskell, 2003). Nurses can use these resources as a guide to provide this education to their patients and families. The video provides awareness of the MedDiet, cardiac disease prevention, and resource links. This resource can be used in a multitude of environments.

Education

Healthcare professionals serving these populations can benefit from standardized education on how to use the MedDiet to prevent CVD. This educational video can be used as a resource to guide healthcare professionals and agencies on what they should be communicating to the families they serve. The video can be used as a template to provide primary education to these providers to further disseminate his information to the community they serve.

These resources can also be used to design a class for patients and caregivers during which additional teaching strategies can be implemented. This would provide a visual and hands-on practice for caregivers. Personal stories can be shared within the class, and it would provide a window of opportunity for patients and caregivers to ask questions.

Limitations and Future Dissemination Plans

Currently, these educational tools are only available on an internal UC Davis server. Patients and caregivers do not have access to this material in the convenience of their home. This information is only available to those who work at UC Davis and to those patients admitted to that hospital. Other facilities or agencies whose mission is to reduce CVD-related deaths do not have access to this material.

This graduate student plans to make these resources available on the UC Davis public server. By doing so, patients and caregivers can access these materials from home after discharge from the hospital. Other facilities and agencies targeting CVD prevention can utilize these resources to provide education to the families they serve.

Conclusion

Despite educational efforts, heart disease remains the number one cause of death in the United States (AHA, 2020). CVD deaths can be prevented by following a heart-healthy lifestyle, which includes the MedDiet. Healthcare professionals should make every effort in CVD

prevention by providing education to patients and caregivers on CVD prevention and the MedDiet. Barriers to MedDiet lifestyle were identified within the literature and partially explained why patients and caregivers do not follow guidelines. One of the greatest barriers was the lack of MedDiet education within the primary care realm of healthcare (Grosso et al., 2017). Providing patients and their families with education is the most crucial tool for better preparing and alleviating stress related to CVD prevention and diagnosis.

The educational video was created to provide foundational and accessible knowledge to education about the MedDIet. It can be used as a tool to guide health care providers in giving adequate education to their patients and address a number of barriers to successful dietary change identified within the literature. Most CVD deaths are preventable, and nurses play a vital role in CVD prevention by educating and demonstrating MedDiet practices. The broader, long-term goal driving this project is leveraging the power of nurse education to reduce the amount of CVD cases related to unhealthy diets and lifestyle in the United States.

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Appendix A: Invitation Letter to Potential Reviewers

To Whom It May Concern,

I am completing my thesis for U.C Davis Masters in nursing leadership. I have created an applied thesis project to address the educational gaps found in the research for educating patients with cardiovascular disease on the Mediterranean Diet (MedDiet). My thesis is titled: Promoting Cardiovascular Health: Addressing Barriers to Implementing the Mediterranean Diet.

To address this gap, I have created an educational video composed of two MedDiet recipes that a patient can use to help them start their new heart health journey. This is a rough edit. With the help of your feedback, I will be editing and polishing this video down to 4-5 mins: MedDiet Cooking Vid *(link to full-length video provided)*.

Your involvement in this process provides an opportunity to discuss and respond to a series of questions about the education video. After feedback is provided on the current video, revision will be made with your recommended changes. The revised video will then be sent out again for a second round of feedback.

Thank you for your time and consideration.

Sincerely,

Ali Berumen

Appendix B: Feedback Questions

1. Was the information provided in the video relevant to Cardiovascular disease treatment? Yes/No
    a. Optional comment:

2. Was the speaker clear? Yes/No
    a. Optional comment:

3. Was the content presented respectfully and professionally? Yes/No
    a. Optional comment:

4. On a scale of 1 to 5 (1=Worst, 5=Best), rate the value of this video for rural healthcare providers when discussing cardiovascular disease treatment.
    a. Optional comment:

5. Do you have any recommendations to improve the content of the educational video?

Appendix C: Education Video Recipes

Three Recipes Developed by Karman Meyer, RDN, LDN

Mediterranean Frittatas

Ingredients:

- 1 teaspoon olive oil
- 1 cup zucchini, thick wedges
- 1 cup baby bella mushrooms, roughly chopped
- ⅓ cup red onion, finely diced
- 2 cups spinach
- ¼ cup Kalamata olives, pitted and chopped
- ½ teaspoon dried oregano
- 6 large eggs
- Black pepper to taste
- ¼ cup crumbled feta cheese

Directions:

1. Preheat oven to 350˚F (177˚C) and lightly oil each well of a muffin pan with olive oil.
2. Heat oil in a large skillet over medium heat, then add zucchini, mushrooms, and onions. Sauté for 2 minutes, stirring to ensure even cooking.
3. Reduce heat to medium-low and add spinach, olives, and oregano. Stir to combine and cook for 2 minutes or until spinach is wilted.
4. Remove skillet from heat and allow vegetables to cool slightly.

5. In a large bowl, whisk eggs and black pepper. Add vegetables and egg mixture, and whisk until combined.
6. Scoop ¼ cup plus 2 tablespoons egg mixture into each muffin pan well. Place pan on the middle oven rack and bake for 20 minutes. Eggs should reach an internal temperature of 160°F (71°C) and be set with no runny liquid remaining on top.
7. Allow cooling for 5 minutes before carefully removing mini frittatas, using a table knife to loosen the edges.
8. Enjoy immediately or store in an airtight container in the refrigerator for up to 3 days. When ready to eat, reheat in the microwave for 30 seconds. Serves 5.

Nutrition facts:

Serving size: 2 mini frittatas

CALORIES 128; TOTAL FAT 8g; SAT. FAT 3g; CHOL. 202mg; SODIUM 211mg; CARB. 4g; FIBER 1g; SUGARS 2g; PROTEIN 9g; POTASSIUM 300mg; PHOSPHORUS 184mg

How To Cook Quinoa

Quinoa is a complete protein containing all nine essential amino acids.

Ingredients:

- 1 cup Quinoa
- 2 cups water or broth

Directions:

1. Rinse quinoa in a fine mesh sieve until water runs clear.
2. Transfer quinoa to a medium pot with water (or broth) and salt. Bring to a boil, then lower heat and simmer, uncovered, until quinoa is tender and a white "tail" appears around each grain, about 15 minutes.

3. Cover and set aside the heat for 5 minutes; uncover and fluff with a fork.

Nutritional facts:

Per serving: 2 cups

160 calories (25 from fat), 2.5g total fat, 0g saturated fat, 0mg cholesterol, 150mg sodium, 27g carbohydrates (3g dietary fiber, 0g sugar), 6g protein

Mediterranean Chicken Quinoa Bowl

Ingredients:

- 1 pound boneless, skinless chicken breasts, trimmed
- ¼ teaspoon salt
- ¼ teaspoon ground pepper
- 1 7-ounce jar roasted red peppers, rinsed
- ¼ cup slivered almonds
- 4 tablespoons extra-virgin olive oil, divided
- 1 small clove garlic, crushed
- 1 teaspoon paprika
- ½ teaspoon ground cumin
- ¼ teaspoon crushed red pepper (optional)
- 2 cups cooked quinoa
- ¼ cup pitted Kalamata olives, chopped
- ¼ cup finely chopped red onion
- 1 cup diced cucumber
- ¼ cup crumbled feta cheese
- 2 tablespoons finely chopped fresh parsley

Directions:

1. Position a rack in the upper third of the oven; preheat broiler to high. Line a rimmed baking sheet with foil.
2. Sprinkle chicken with salt and pepper and place on the prepared baking sheet. Broil, turning once until an instant-read thermometer inserted in the thickest part reads 165 degrees F, 14 to 18 minutes. Transfer the chicken to a clean cutting board and slice or shred.
3. Meanwhile, place peppers, almonds, 2 tablespoons oil, garlic, paprika, cumin, and crushed red pepper (if using) in a mini food processor. Puree until fairly smooth.
4. Combine quinoa, olives, red onion, and the remaining 2 tablespoons oil in a medium bowl.
5. To serve, divide the quinoa mixture among 4 bowls and top with equal amounts of cucumber, the chicken, and the red pepper sauce. Sprinkle with feta and parsley.

   Tips:

   Make-Ahead Tip: Prepare chicken (Step 2), red pepper sauce (Step 3), and quinoa (Step 4); refrigerate in separate containers. Assemble just before serving.

Nutrition Facts:

Serving Size: 3 oz. chicken, 1/2 cup quinoa & 1/4 cup sauce each

Per Serving:

519 calories; 26.9 g total fat; 4.5 g saturated fat; 91 mg cholesterol; 684 mg sodium. 686 mg potassium; 31.2 g carbohydrates; 4.2 g fiber; 3 g sugar; 34.1 g protein; 1158 IU vitamin a iu; 7 mg vitamin c; 62 mcg folate; 113 mg calcium; 3 mg iron; 119 mg magnesium.