5-1-2017

Review of Best Practices to Help People Reduce their Red and Processed Meat Consumption

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REVIEW OF BEST PRACTICES TO HELP PEOPLE REDUCE THEIR RED AND PROCESSED MEAT CONSUMPTION

by

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Bachelor of Science in Nursing, University of North Dakota, 2011

An Independent Study

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Master of Science

Grand Forks, North Dakota

April

2017

Abstract

Many Americans eat nearly fifty percent more than the daily recommended amount of meat per day. Recent studies have shown that the higher the amount of meat, especially red and processed meat, that people consume, the greater their risk of developing diseases (e.g. heart disease, kidney disease) and/or cancer. With more of these studies surfacing, it is our job as health care professionals to encourage healthy eating habits upon our patients that strongly consider reducing meat intake.

A review was conducted on various studies that relate to the issue of high amounts of meat consumption and an analysis was provided for each article. Articles were categorized into the following: reduction of meat for health and the environment; developed interventions; plant-based, vegetarian focused, or meat reduction in diets; children studies; and policy interventions. The majority of evidence evolved from studies showing benefits of reducing red and processed meat consumption for human and environmental health. Additional beneficial findings are: finding meat alternatives, using other sources of protein, limiting red/processed meats, adopting plant-based diets, and incorporating an educational intervention.

The findings should be incorporated in nursing practice, education, and policy by using an educational plan with key points of this study, along with any additional relevant information; adding a lecture regarding risks of consuming a diet high in red/processed meats and effective interventions; and adopting the interventions within their worksites throughout the community. Further research is needed specifically for identifying ways to help people reduce their red/processed meat consumption.

We all get caught up in our daily lives that we may put our own health on the "back burner". To exemplify a bit more on this statement the following scenario is provided. You live day-by-day with the same busy schedule: you get ready, drop off the kids at school, and go to work. Work has been full of chaos lately and you find yourself taking multiple mini-breaks. Time feels like it is ticking away and before you know it the work day is done. You feel exhausted, mostly mentally, from what you have encountered and find there is just no time to cook dinner. You then make that extra trip from work to the local fast food restaurant or deli that have the ready-made meals for your own convenience. Within thirty to forty-five minutes, depending on traffic, you have picked up the kids and you are now at home eating dinner together.

As human beings, we bypass the reality of what we consume from our busy schedules and fast meal trips. A great proportion of the meal the family in the scenario consumed was most likely preheated and processed.

Many Americans eat nearly fifty percent more than the daily recommended amount of meat per day, which includes another attribute Americans love: large portion sizes (Huffington Post, 2012). Recent studies have shown that the higher the amount of meat, especially red and processed meat, that people consume, the greater their risk of developing diseases (e.g. heart disease, kidney disease, and osteoporosis) and/or cancer (Meatless Monday, 2013).

One study was conducted by Harvard researchers that tried to identify links between meat consumption and cause of death (Harvard Health Publications, 2012). This study found that people who ate the most red meat died at a younger age and were most likely to die from cardiovascular disease and cancer (Harvard Health Publications, 2012). Within the study,

researchers followed approximately 84,000 women and 38,000 men over a twenty-eight-year span; they determined about 24,000 people died from cardiovascular disease and cancer (Harvard Health Publications, 2012). The researchers provided each participant with questionnaires to determine how much and what kind of meat they consumed during this period, while they were living. Participants stated that the servings they consumed in unprocessed meat (i.e. beef, pork, lamb, hamburger, etc.) and processed meat (i.e. bacon, hot dogs, sausage, salami, bologna, etc.) was more than the size of 3 ounces or a portion about the size of a deck of playing cards (Harvard Health Publications, 2012). With each additional serving of red meat, it increased the risk of death by thirteen percent and if it was processed meat it raised the risk to twenty percent (Harvard Health Publications, 2012). In addition, another study determined that people can consume up to 18 ounces of red meat a week (approx. 2.5-3 oz/day) without raising the cancer risk significantly; however, cancer risk will start to rise with small daily portions of processed meats (American Institute for Cancer Research, 2007).

With more of these studies surfacing, in regards to the harmful effects of red and processed meat consumption, it is our job as health care professionals to encourage healthy eating habits upon our patients that strongly consider reducing meat intake. We should declare every patient encounter as a moment to educate and help them better their lives. Thus, it leads us to the clinical question: What are the best practices to help people reduce their red and processed meat consumption?

Purpose

The purpose of this study is to find the best evidence that supports how health care providers can help their patients reduce their overall red and processed meat consumption to decrease their risk of developing diseases and/or cancer. Identifying best practices that have

been successful and unsuccessful in reducing red and processed meat consumption is essential for this study. Once these best practices are identified, they will be critiqued and analyzed to produce an educational plan for health care providers to use during each patient visit. This current educational material relating to ways to help their patients reduce their red and processed meat intake will be readily available for providers to incorporate into the patient's meal plans. This plan may be used universally and may benefit patients across the entire lifespan.

Significance

People are consuming large portions of red and processed meat that may affect their health. Adopting these eating behaviors will not only affect one's own health, but the health of their children/family. Adult habits may be passed onto family members, which in time will affect their health as well.

Recent studies indicate the harmful effects red and processed meat consumption has when consumed in large amounts. The World Health Organization (2015), declared consumption of processed meat as carcinogenic to human beings and high red meat consumption as probable carcinogenic. Harvard's School of Public Health (2015), explained that high amounts of red meat can increase a person's risk of developing diseases such as heart disease, diabetes, colorectal cancer and may even increase risk of dying from the diseases.

The World Cancer Research Fund International (n.d.), expressed the importance of limiting red meat and avoiding processed meat altogether. The overall public health goal for meat intake is having an average consumption of red meat not exceeding no more than 300g (11oz) a week with very little, if any, of processed meat (World Cancer Research Fund International, n.d.). The personal recommendation for meat intake explains that people who eat

red meat, should consume less than 500mg (18 oz) a week with very little, if any, processed meat (World Cancer Research Fund International, n.d.). The personal recommendation is used to assist individuals with a starting point or goal regarding meat reduction in their diet; however, the overall public health goal is to taper this down to 11oz/week of red meat rather than 18oz/week.

Many people are at risk of developing diseases that can affect their health. Prevention should be the first step of anyone's health plan. Prevention of diseases are beneficial for the individual, their family, and the community. What better way to take control of one's own health than to control what is put into one's body? Prevention methods may involve behavioral changes in patients' lives, including healthier eating habits. With lifestyle changes, patients may need encouragement and support from their healthcare team to remain on a healthy eating pattern.

Nurses and providers who work closely with patients on a day-to-day basis have a chance for patient education. The information provided to patients should be current and evidence-based. As health professionals, there is a continuous need to encourage healthy lifestyles, including eating habits and disease management and/or prevention. Conducting such reviews or studies helps determine if the education provided by health care professionals is effective and successful in patient teaching.

The results of this review will provide helpful and useful information when it comes to encouragement of healthy eating behaviors, explicitly to meat consumption. It will also provide potential gaps in research and recommendations in future research studies specific to best practices that help reduce red and processed meat consumption.

Theoretical framework

The transtheoretical model (TTM), also known as the stages of change model, was used within this study. The TTM focuses on behavioral change with an individual's motivation to take action. The TTM was originally created by Prochaska and DiClemente in the 1980s for smoking cessation evaluation (Howarth, 1999). The model was known to be applied to addictive behaviors; however, it has been used to evaluate non-addictive health behaviors as cited in (Howarth, 1999).

There are five stages within the TTM. Each stage determines the individual's level of readiness to change. The first stage is called the pre-contemplation stage. At this stage, the person may or may not be aware that they have a behavior problem and are not willing to change or have no intention of changing within the next six months (Spencer, Wharton, Moyle, & Adams, 2007). Some people may describe this stage as a person being in denial.

The second stage is called the contemplation stage. Once a person reaches this stage, they realize they have a problem and are thinking of making a change and intending to change within the next six months (Spencer, et al., 2007).

The third stage is known as preparation. During preparation, the person is preparing themselves to start their change within the next four weeks (Spencer, et al., 2007).

The fourth stage is action. This stage begins when the person makes the behavior change and will continue until they have maintained the change within the next six months (Spencer, et al., 2007).

The fifth stage is called the maintenance stage. This stage occurs when the individual maintains and continues through with the change for the full six months (Spencer, et al., 2007).

The individual also plans to continue maintaining the changed behavior beyond the six-month time period.

The stages of the TTM progress from one stage to another; however, a person can regress and may have to start a stage over. It is important to note that behavior changes take time and do not occur suddenly. It takes time for a person to work through the first stages to make a decision and some people may take longer than others. In addition, there are people who may think of making a change but never actually take the next step of performing the change. Even though it is an individual's decision to make the first step to change, healthcare workers can assist with this process by providing the education and the support the person may need. Thus, this model works well for healthcare workers to intervene and help patients reduce their red and processed meat consumption.

The five stages of change are not the only concepts that encompass the TMM. Other concepts include the processes of change and outcome measures such as self-efficacy and decisional balance (Howarth, 1999). The processes of change are factors that develop transitions between stages (Table 1). Each factor listed in the table can be used to change behavior and be considered as an indicator to move forward in the stages.

Spencer et. al (2007), identified the following processes as most effective for the individuals in the precontemplation and contemplation stages: dramatic relief, consciousness raising, self-re-evaluation, environmental re-evaluation, and social liberation. The following behavioral processes were also identified as most effective for the individuals in the preparation, action, or maintenance stages: helping relationships, self-liberation, counter-conditioning, stimulus control, and reinforcement management (Spencer, et al., 2007).

Self-efficacy is explained as the confidence a person has to perform a behavior. If this was used in a dietary behavior change, self-efficacy could be measured by asking questions that would determine the confidence level a person is within to successfully perform a diet-related behavior.

Spencer, et. al (2007), describe decisional balance as, "the balance of the pros and cons of changing a behavior" (p. 47). This occurs when a person identifies both reasons for changing a behavior and not changing a behavior. If a person moves from contemplation to preparation, the pros of change will outweigh the cons of change. If a person is in the precontemplation stage, the cons will most likely outweigh the pros. This may apply to behavior change, such as eating healthier.

Some studies conducted in regards to TTM and dietary change showed promising results for adopting TTM as a framework for behavior change. Vallis et. al (2003), explained the importance of using the TTM to help people with diabetes manage their disease by enhancing motivation for self-care. Behavioral changes occur during diabetes management, especially in healthy eating and physical activity patterns. The results of the study indicated that the stage algorithm was successful; however, other factors influenced the level of readiness for adopting a healthy, low-fat diet. These factors included demographic's, eating-related, diabetes-related, and psychosocial factors (Vallis et. al, 2003).

Another study indicated that studies focusing on dietary behaviors and using the TTM focused on nutritional outcomes rather than food behaviors (Horwath, 1999). Another conclusion explained that by using the TTM, it can accurately stage a classification system for those with food-based goals, however, there are misclassification issues that occur with those who set nutrient-based goals (Horwath, 1999). Horwath (1999), further added that there is a

need for further research on the entire model, including the processes of change, rather than on single parts of it.

There are no current studies completed using the TTM and reduction of an individual's meat consumption as a dietary behavior change. However, with research being conducted on the TTM and dietary behavior change it provides some support regarding utilizing this model for this review. The TTM may also be used simultaneously to assess and motivate a person's level of readiness to change eating behaviors, such as reducing their red and processed meat intake.

Table 1. The Processes of Change

Process	Definition and intervention strategies
Experiential:	
Consciousness raising (CR)	Increasing understanding and awareness of self and problem behavior (observations, bibliotherapy)
Dramatic relief (DR)	Experiencing and expressing strong emotional reaction to events occurring in the environment; involves catharsis (psychodrama, role-playing)
Self-re-evaluation (SR)	Appraising the pros and cons associated with changing the problem behavior (clarify values, imagery, imagine how overcoming problem will feel)
Environmental re-evaluation (ER)	Appraising how one's problem behavior affects other people or the environment in general (empathy training)
Social liberation (SL)	Is concerned with changes in the environment that provide the individual with alternatives (policy intervention)
Behavioral:	
Self-liberation (SL)	Choosing and committing to act, believing in ability to change (decision-making therapy)
Counter-conditioning (CC)	Substituting alternatives for problem behavior (relaxation, desensitization, assertion)
Stimulus control (SC)	Removal of cues or avoidance of situations which trigger the behavior, restructuring one's environment to add stimuli for alternative behaviors
Helping relationships (HR)	Trusting others, and accepting and utilizing their support to change (social support, self-help groups)
Reinforcement management (RM)	Rewarding oneself or being rewarded by others for making changes (contracts, overt and covert reinforcements)

(Spencer et. al, 2007).

Definitions

Green house gas emissions (GHGE): Gases that trap heat in the atmosphere, which make the Earth warmer. People are adding several types of greenhouse gases in the atmosphere. Their effect is determined by how much, how long, and how powerful.

Flexitarian: Someone who eats mostly plant-based foods, but occasionally eats meat, poultry, and fish.

Lacto-ovo vegetarian: Someone who excludes meat, seafood, and poultry, but includes eggs and dairy products in their diet.

Lacto-vegetarian: Someone who excludes eggs, meat, seafood, and poultry, but includes milk products in their diet.

Mediterranean diet: Similar to a whole-foods, plant-based diet but allows small amounts of chicken, dairy products, eggs, and red meat once or twice per month. Fish and olive oil are encouraged. Fat is not restricted.

Norm activation theory: Focuses explicitly on the moral and normative dimensions of human behavior. It includes three main variables: personal norms, which related to the feeling of moral obligation to perform or inhibit a specific action; awareness of consequences, which relates to whether someone is aware of the negative consequences for others when not active; and ascription of responsibility, which relates to the feelings of responsibility for negative consequences of not acting.

Ovo-vegetarian: Someone who excludes meat, seafood, poultry, and dairy products, but includes eggs.

Plant-based diet: Encourages whole, plant-based foods (e.g. vegetables, fruits, beans, peas, lentils, soybeans, seed, nuts) and discourages meats, dairy products, and eggs as well as all refined and processed foods. (see *Whole-foods, plant-based, low fat Definition*)

Processed meat: Refers to meat preserved by smoking, curing or salting, or addition of chemical preservatives, including that contained in processed foods (e.g. ham, bacon, pastrami, salami, hot dogs, sausages).

Protection motivation theory: Formulates the effects of threatening health information on attitude and behavior change.

Raw food, vegan: Same exclusions as veganism as well as the exclusion of all foods cooked at temperatures greater than 118°F.

Red meat: Refers to beef, pork, lamb, and goat from domesticated animals including that contained in processed foods (e.g. hamburgers, steak, pork chops, roast lamb).

Sustainable diet: Diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations.

Theory of planned behavior: A framework for understand, predicting, and changing human social behavior.

Vegan (or total vegetarian): One who excludes all animal products, especially meat, seafood, poultry, eggs, and dairy products. Does not require consumptions of whole foods or restrict fat or refined sugar.

Whole-foods, plant-based, low-fat: Encourages plant foods in their whole form, especially vegetables, fruits, legumes, and seeds and nuts (in smaller amounts). For maximal health benefits this diet limits animal products. Total fat is generally restricted.

Process

Various resources were analyzed and used when conducting the literature review. The literature review was completed to determine what strategies have been used and which are most effective at reducing red and processed meat consumption.

Sources were discovered through extensive research through the Harley E. French School of Medicine and Health Sciences library at the University of North Dakota, including databases such as CINAHL, Pubmed, Cochrane, and Google Scholar; Devils Lake Public Library; U.S. Department of Agriculture; American Dietetics Association; World Cancer Research Fund International; American Institute for Cancer Research; Mayo Foundation for Medical Education and Research; Harvard Medical School; Office of Disease Prevention and Health Promotion; and a local dietitian at the Spirit Lake Health Center in Fort Totten, ND.

Search terms that were used throughout databases included: red and processed meat consumption, health benefits, reduction of meat, vegetarianism, how to reduce meat intake, healthy eating behaviors, benefits of less meat consumption, reducing risk through changes in eating behaviors, effects of high meat consumption, and various other combinations of these words to identify pertinent references. Other helpful sources included the Dietary Guidelines for Americans 2015-2020, the Humane League, the Eat Well Project, and John Hopkins Center for a Livable Future. Limits that were used: peer reviewed, time frame (from 1990 to 2016), and

academic journals. There were a limited number of articles found pertinent to the review using limits, thus limits were not used as often in other searches.

The information found from the literature will be used to identify what methods were effective in helping people reduce their red and processed meat consumption. Any additional findings relevant to this problem will also be considered. Health care workers should be using the most current educational materials when visiting patients one-on-one. With this said, all findings pertinent to reducing overall meat consumption were gathered and used in an educational plan. This educational plan includes key points found in the literature review for health care workers to utilize during patient visits. The primary focus for dissemination will be all health care workers, but particularly those who work very close to patient's in regards to meal planning (e.g. dietitians, diabetes educators, physicians, nurses). This educational plan can also be modified for other health care workers, such as community health workers who may not have as much experience with meal planning.

A patient brochure will also be developed from the key points of the educational plan for take-home material. This brochure will include any relevant findings from the literature review and research to encourage a reduction in red and processed meat intake. The brochure is designed be easy to read and understand and catch the reader's attention. The educational plan and brochure are targeted at adult patients.

The educational plan can be used to guide best practices for health professionals that work first hand with patients regarding healthy eating practices. These materials are used to direct patients toward healthier choices that will make a positive impact on their overall health. The educational plan and brochure will be disseminated to the following local agencies: Spirit Lake Tribal Health; Spirit Lake Health Center; Women, Infants, and Children; Food Distribution

Program; Lake Region District Health Unit; Mercy Hospital; and Altru Lake Region Clinic. Health care professionals can utilize the plan during visits and assist patients with keeping track of their overall meat consumption. Patients can keep track of their meat consumption by keeping food diaries and having the health care professional review them periodically. Providing a short patient survey regarding meat consumption can also help determine if the education they received was sufficient enough to convince the patient to reduce red and processed meat consumption.

Review of literature

The issue of high consumption of red and processed meat can be easily forgotten or "placed on the back burner" while healthcare professionals care for patients within their own busy schedules. Sometimes they might get so caught up with what is currently going on that they may forget to educate the patient regarding another important aspect of patient care that improves health: healthier eating habits. Healthier eating habits have been an ongoing struggle with some patients, especially in America, where the "bigger is better" mentality can take hold on a person. Americans like large portions for cheap/fair prices and usually the larger the portion, the less nutritional the food item actually is. One of the concerns in regards to this is the large consumption of red and processed meat, which led to this literature review of articles related to the problem of concern. What has been done or what has been effective in helping people reduce their red and processed meat intake?

Through research of various databases and search engines, sources were identified as relevant to the present study. Articles were categorized by significance to the study. Categories include: reduction of meat for health and the environment; developed interventions; plant-based,

vegetarian focused, or meat reduction in diets; children studies; and lastly, policy interventions. Articles are not fixed in just one category; they can interchange.

Reduction of meat for health & the environment

Seven articles were placed within this category. The first article was a comparative analysis of the benefits of dietary change on health and climate. It determined that our food system is responsible for more than a quarter of all greenhouse gas emissions (GHG) and unhealthy eating habits contribute to early mortality (Springmann, Godfray, Rayner, & Scarborough, 2015). Springmann et. al (2015), also added that high consumption of red and processed meat, along with low consumption of fruits and vegetables contribute to early mortality especially for people who are overweight or obese. The analysis consisted of a combined approach using a comparative risk assessment model for the dietary piece and a meta-analysis of life cycle studies by linking regional and scenario-specific food type consumption levels to GHG emissions for the environmental analysis (Springmann, et. al, 2015). Using this joint framework allowed the analysis to provide evidence supporting that if people were to transition more to a plant-based diet, it could reduce global mortality by 6-10% and food-related GHG emissions by 29-70% (Springmann, et. al, 2015). This evidence may be beneficial in helping people see the impact that high meat consumption really has on the planet and in turn convince them to reduce not only their meat consumption, but their carbon footprint as well.

The second article encouraged physicians to educate patients regarding a diet with less meat to not only benefit just their health, but also the environment. Wellberry (2016), adds that the *2015-2020 Dietary Guidelines for Americans* and other sources provide moderate to strong evidence that demonstrates when someone has a healthy dietary pattern that consists of higher amounts of fruits, whole grains, legumes, nuts, and seed, and lower amounts of animal-based

foods, it will have more favorable environmental outcomes in the long run. In addition, this study explains what physicians should be telling their patients about eating meat. Physicians should be encouraging recommendations from the *2015-2020 Dietary Guidelines for Americans*, including the Mediterranean diet (see Definitions) and the Dietary Approaches to Stop Hypertension (DASH) diet (Wellberry, 2016). Studies analyzed also indicate that a healthy diet usually requires reduced meat and dairy consumption and no intake of processed meat whatsoever (Wellberry, 2016). The literature provides evidence that physicians have a chance to impact their patients by providing education on how they can improve their health and the environment by reducing their meat and other animal-based food intake. Health care professionals can make this impact with every patient encounter and by introducing the idea that what the patient consumes will not only affect their health, but the planet as well.

The third article also tackled the problem of obesity and climate change. The aim of this study was to "take one element of environmental sustainability (e.g. GHG emissions) and test the compatibility of diets that meet dietary requirements for health with dietary changes needed to reduce GHG emissions" (p. 633) (Macdiarmind, Kyle, Horgan, Loe, Fyfe, Johnstone, & McNeill, 2012). A database was created for 82 food groups that linked nutrient composition and GHG emission data. Linear programming was used to create a list of foods that met dietary recommendations while minimizing GHG emissions. Foods high in GHG emissions, such as meat and dairy products, were minimized almost to the point of being removed completely from the diet (Macdiarmind et.al, 2012). Macdiarmind et. al (2012), explained that diets without meat entirely are not easily accepted, so it is best to limit meat rather than completely removing it from the diet. Limiting meat consumption and holding a sustainable diet (see Definitions), while

meeting dietary recommendations for health, will still lower EHG emissions; therefore, being beneficial to both the body and the environment.

The fourth article had a similar approach by using the environmental impact as a method of helping people reduce their meat consumption. The study focused on identifying predictors of meat consumption and how to reduce it (Zur & Kockner, 2014). A model was created from the theory of planned behavior, the norm activation theory, and the protection motivation theory (see Definitions) that was tested in a questionnaire including self-reported meat consumption. All three theories have different aspects for the decision to reduce meat consumption. The sample size was 210 adult citizens of Norway (Zur & Kockner, 2014). This study found that interventions for reduction of meat consumption should be tailored to the person. In order to tailor it to the person, you must identify habits, health beliefs, moral beliefs, attitudes, social norms, and alleged behavioral control as important parts in the decision-making process (Zur & Kockner, 2014). The study also confirmed that reduction in meat consumption is motivated by different reasons, mainly morality and health. This provides support of evidence that some people are making the choice to reduce their meat consumption due to their moral beliefs and for the health benefit.

The fifth article focused greatly on the impact of the high consumption of animal-sourced food on the environment. This article provided an overview of the connection between animal product consumption and current and future patterns of ecosystem degradation and biodiversity loss, along with linkages to human health (Machovina, Feeley, & Ripple, 2015). Solutions that were included improvement on human nutritional health, decrease in land demands, and how to protect biodiversity are as follows:

1. reduce animal product consumption by increasing plant-based diets,

2. replace meat with more efficient protein sources, and
3. reintegrate livestock into diverse ecological production systems (i.e. integrating by-products or wastes from one species are recycled to become inputs such as fertilizers, food or energy for another) (Machovina, Feeley, & Ripple, 2015).

The article further indicated that if these solutions are to be implemented, it will support future health by lowering the demands of animal products, fossil fuel energy use, GHG emissions, and pollution while improving global human health (Machovina, Feeley, & Ripple, 2015). This article may not provide as strong evidence as others regarding best practices in reducing meat consumption in one's diet; however, it indicates that by reducing meat consumption by finding other sources of protein and increasing plant-based diets it will not only help today, but also in the future in regards to human health and environmental health.

The sixth article provided a variety of approaches in reducing meat consumption. One approach is minimizing meat intake rather than avoiding meat all together. Another approach is supplementation of meat products with hybrid meat alternatives (Bakker & Dagevos, 2012). These hybrids are modified to look like meat products, but are made up of plant-based replacements (Bakker & Dagevos, 2012). A third approach is to moderate meat consumption by marketing reduction in meat consumption through campaigns such as a meatless day out of the week. This approach can introduce these meatless or low-meat dinners as "normal" alternatives that are appealing (Bakker & Dagevos, 2012). This approach should be promoted in a positive manner as well, to make a greater impact. A more positive approach could focus on what is good for one's health and the planet rather than what is bad. Bakker & Dagevos (2012), described another approach as a change in culture by increasing awareness of animal welfare and

the impact on the environment. This study suggested a variety of activities to help reduce meat consumption and support for sustainable food practices.

The last article confirmed another study regarding human health and animal welfare. The study used a population survey to investigate meat consumption behaviors and explored the impact on human health, animal welfare, and the environment (Clonan, Wilson, Swift, Leibovici, & Holdsworth, 2014). Subjects were UK adults ages 18-91 years, 497 females and 345 males. All were provided with a survey relating to red and processed meat consumption, including attitudes, behaviors, intake, and sociodemographic characteristics (Clonan et. al, 2014). The majority of the respondents indicated that human health and animal welfare are the more common motivations to avoid red and processed meat, than the environmental aspect (Clonan et. al, 2014). This study indicates a need to increase the public's awareness of the environmental impact of eating red and processed meat and confirms that human health is a motivation to reduce meat consumption.

Developed interventions

Three articles were identified within this category. The first article involved designing an intervention for people with colorectal adenomas to help reduce their intake of red and processed meat and increase their levels physical activity. It was a qualitative study that included patients aged 60-74 years. Patients were in the National Health Service Bowel Cancer Screening Program and were selected randomly from a patient tracking database (Dowswell, Ryan, Taylor, Daley, Freemantle, Brookes, Jones, Haslop, Grimmett, Cheng & Sue, 2012). Some participants were included in focus groups and interviews and others were mailed a questionnaire. Many were described as being in the pre-contemplation stage of the TTM (lacked readiness to change) (Dowswell et. al, 2012). These people believed they were not performing any risky behaviors,

especially to their health and cancer risk. This study indicated the need to individualize interventions to each person, especially with identifying the lack of knowledge about colon cancer and the lack of motivation to change their behaviors that would in turn reduce their risk and enhance their overall health (Dowswell et. al, 2012). This study has shown the importance of increasing the awareness of the health risks high consumption of red and processed meat can have on a person, along with the need to educate patients regarding risky behaviors.

The second article was a pilot study that was conducted in the University of Nottingham. This study focused on a dietary intervention to help reduce meat intake by 50% in University students (Holloway, Salter, & McCullough, 2012). Twenty-six healthy subjects were recruited from the University to partake in the study by completing a 7-day diet diary and health and well-being questionnaire (Holloway, Salter, & McCullough, 2012). Subjects were give non-meat alternatives to replace about 50% of the energy they were used to obtaining from meat. These alternatives included protein-rich, plant-based foods. They were monitored over a 4-week meat reduction period and were given another questionnaire at the end of the study (Holloway, Salter, & McCullough, 2012). All subjects were successful in incorporating non-meat alternatives into their diets (Holloway, Salter, & McCullough, 2012). This study indicated that by supplying the support and education on non-meat alternatives, young college students can be successful at reducing their meat intake by 50%.

The last article in this category described its own Project PREVENT intervention. It was a randomized trial to help reduce multiple behavioral risk factors for colon cancer (Emmons, McBride, Puleo, Pollak, Clipp, Kuntz, Marcus, Napolitano, Onken, Farraye, & Fletcher, 2005). The sample included 1,247 patients with recent diagnosis of adenomatous colorectal polyps. After one-month post-polypectomy, patients completed a survey by phone and were randomized

to either usual care or the PREVENT intervention (Emmons et. al, 2005). This intervention consisted of a telephone-delivered intervention and other materials that focused on reducing behavioral risk factors for colorectal cancer among patients who have a diagnosis of adenomatous colorectal polyps (Emmons et. al, 2005). These risk factors are: red meat consumption, fruit and vegetable intake, multivitamin intake, alcohol, smoking, and physical inactivity (Emmons et. al, 2005).

Participants were identified through Health Center databases and were sent a letter introducing the project. Those who called the toll-free number provided in the letter either enrolled or refused to participate (Emmons et. al, 2005). A total of 1,979 participants were sent the letter; 1,247 enrolled (Emmons et. al, 2005). There were two groups: the usual care control group and the project PREVENT group (Emmons et. al, 2005). The control group consisted of participants who received the usual care offered by the facility they went to for health care (Emmons et. al, 2005). They were encouraged to meet behavior change targets and were provided with a Colorectal Cancer Prevention tip sheet (Emmons et. al, 2005).

The PREVENT group had the intervention that had three objectives:

1. identifying an adenomatous polyp as the main reason and motivation for risk factor reduction in people with colorectal cancer and other chronic diseases (Emmons et. al, 2005).
2. strengthen self-efficacy in patients to change their risky behaviors by helping them recognize what they can change in their risky health habits to change more than one habit at a time (Emmons et. al, 2005).
3. help the patient's learn skills that can be used to help change any of their risk factors they identified (Emmons et. al, 2005).

Those in the intervention group received a telephone session from a health educator that focused on increasing motivation and goal-setting; four follow-up telephone calls that included counseling over the next four months regarding motivation for change; printed progress reports with follow up calls to reinforce goals and areas needing further consideration; and self-help materials individualized to the patient (i.e. smoking cessation or log to keep a personal diary for their goals) (Emmons et. al, 2005).

Those who participated with PREVENT had a greater reduction in prevalence of multiple risk factors for colorectal cancer compared to the usual care. PREVENT patients were also more likely to change more than one behavior than the usual care patients (Emmons et. al, 2005). This study showed that a multiple risk factor approach was more effective than the usual care approach. With the possibility of a PREVENT patient changing at least one behavior, this gives the chance of the change being to reduce red meat consumption.

Plant-based, vegetarian focused, or meat reduction diets

Three articles were identified within this category. The first article in this category examined whether the kind of message a patient receives to reduce their animal product consumption leads to an actual change. A total of 1,594 respondents participated and were recruited on college campuses. Each participant completed a survey on food consumption, and following completion they were given a pamphlet to review, and then completed a second survey. Pamphlets had different messages; these messages are as follows:

- encouragement to eat vegan (see Definitions)
- encouragement to eat vegetarian (see Definitions)
- encouragement to eat less meat

- encouragement to cut out or cut back on meat and other animal products
- control group (didn't receive a pamphlet) (Doebel & Gabriel, 2015).

Respondents were contacted two to four months after receiving the booklets and were provided an opportunity to complete another survey (Doebel & Gabriel, 2015). Out of the respondents, 601 responded. The study suggests that the combination of cutting or cutting back on meat and other animal products was the most effective approach for getting people to reduce their consumption (Doebel & Gabriel, 2015). However, the control group changed its meat consumption the most (Doebel & Gabriel, 2015). There were three possible explanations as to why this occurred. The first is the possibility of sampling error and the small sample size may not accurately reflect the amount of change you could see in a large population; the second is the possibility that the intervention adjusted the accuracy of reporting on product consumption (i.e. those who received the intervention were more accurate that the control group with reporting); lastly, there can be the possibility that reflecting on one's own diet can lead to a large amount of positive change (Doebel & Gabreil, 2015). This study provides evidence that there is a method to help people reduce their meat consumption, but some people may reduce their consumption on their own.

The second article focused on the number of current and former vegetarians/vegans and examined their decisions to adopt or give up on this form of diet. The sample study had 11,000 respondents and who were provided with an online survey (Asher, Green, Gubrod, Jewell, Hale, & Bastian, 2014). The study found from the responses that adopting a vegetarian/vegan diet is far more successful than adhering to it (Asher et. al, 2014). This may be from a variety of reasons such as a need to improve vegetarian/vegan retention, emphasize reductions of animal products, and a need to raise awareness of this issue (Asher et. al, 2014). Motivations for eating

a vegetarian/vegan diet varied. These motivations were: overall health (number one motivator), animal protection, concern for the environment, feelings of disgust about meat/animal products, and taste preferences (Asher et. al, 2014). Recommendations were to make these diets more appealing to others to help reduce the amount of animal product consumption and to raise awareness about "why" and "how" to go vegetarian/vegan (Asher et. al, 2014). This study provided evidence regarding the motivators to adopt a vegetarian/vegan diet to reduce animal product consumption; however, recommendations should be considered for future adherence following adoption, in order to make initial dietary changes sustainable over time.

The last article within this category provides an update for physicians regarding plant-based diets (see Definitions). The review of literature implies that the best diet to turn to in combating chronic illnesses is a plant-based diet (Tuso, Ismail, Ha, & Bartolotto, 2013). This update provided physicians with information that a healthy, plant-based diet requires planning, reading labels, and discipline. Physicians should encourage patients to adopt this diet by confirming the benefits on health, such as, reducing weight, decreased risk of cancer, reduction in risk of death from ischemic heart disease, and the possibility of reducing the number of medications they need to treat chronic conditions (Tuso, Ismail, Ha, & Bartolotto, 2013). In addition, the review of literature encouraged physicians to not use terms such as vegan and vegetarian and start using language about eating healthy, whole, plant-based foods and minimizing consumption of meat, eggs, and dairy products (Tuso, Ismail, Ha, & Bartolotto, 2013). This review of literature is meant to encourage physicians to educate regarding healthy eating habits rather than prescribing a medication (Tuso, Ismail, Ha, & Bartolotto, 2013).

Other relevant information was collected from a campaign known as "Meatless Monday". This campaign is an international movement to help reduce overall meat consumption to improve

human health and planet health by not eating meat one day out of the week (Meatless Monday, 2013). It is a non-profit initiative of The Monday Campaigns and is in association with the Johns Hopkins Bloomberg School of Public Health (The Monday Campaigns, 2017). "Meatless Monday" provides information and recipes for each week including meat alternatives that are not only healthy for you but also friendly to the environment (Meatless Monday, 2013). This campaign has taken off fast and is found in 24 different countries, including the support of schools, restaurants, media, celebrities, and communities (Meatless Monday, 2013). This campaign is a motivator to help people reduce their meat consumption to improve their health and protects the planet.

Children studies

Two articles were identified within this category. The first article of this category investigated the impact of diets with less or no meat and dairy products on nutrient intakes in Dutch children. Replacement scenarios were used from the Dutch National Food Consumption Survey—Young Children (2005-2006), along with assessment of nutrient intakes from consumption patterns (Temme, Bakker, Seves, Verkaik-Kloosterman, Dekkers, Raaij, & Ocke, 2015). There were 1279 children ages 2-6 years old included with this study and caregivers completed food consumption surveys on their child. Findings indicated that partial replacement of meat and dairy by plant-based foods were beneficial for children's health by lowering saturated fatty acid intake, increasing fiber content, and maintaining micronutrient intakes (Temme, et. al, 2015). On the other hand, if full replacement occurred, it was recommended to ensure that the child consumes adequate thiamin, vitamin B12, and zinc intakes (Temme, et. al, 2015). This article confirms that partially replacing meat in children diets is possible and is beneficial to their health.

The second article provided a study that incorporated a long-term nutrition and physical activity curriculum to a rural, low-income, biethnic (Hispanic-white, non-Hispanic- white) community in Colorado. The main purpose was to test the efficacy of the Denver-based Integrated Nutrition Education Program (INP) after it was adapted for and delivered in a rural setting (Belansky, Romaniello, Morin, Uyeki, Sawyer, Scarbro, Auld, Crane, Reynolds, Hamman, & Marshall, 2006). The school had second and third grades with 10 classrooms for each grade and 16 students to each classroom in attendance (Belansky, et. al, 2006).

The curriculum consisted of four different lessons: (1) parts of plants: leaves—students learned about plants and their nutritional value for good health; (2) apple tasting/comparison chart—students learned about different varieties of apples and their health benefits; (3) find the fat in foods—students learned that certain snack foods contain "hidden fats" and that it's important to limit the fat in their diet; (4) exercise kid convinces couch potato—students learned that regular exercise is necessary to stay healthy and feel good about themselves (Belansky, et. al, 2006).

The curriculum was adopted over a two-year period and was evaluated through class surveys and class observations (Belansky, et. al, 2006). The primary findings from this study was that the curriculum increased children knowledge, attitudes, and self-efficacy related to nutrition, but not physical activity (Belansky, et. al, 2006). The study also expressed the importance of educating students regarding health education annually. This study may have not provided evidence specifically in regards to a reduction in red and processed meat; however, it provided evidence that a school curriculum is effective in enhancing student outcomes in regards to nutrition and healthy eating by providing the education they need.

Policy interventions

The article within this category looked at the effectiveness of policy interventions to promote healthy eating from the Eat Well Project funded through a European Community Framework Program for Research. This study identified nutrition policy interventions and determined whether they have been evaluated for effectiveness and cost effectiveness (Eat Well, 2009). Literature was reviewed for evidence supporting the effectiveness of policy interventions (Eat Well, 2009). These interventions were split and reviewed into two different categories: informed choice and the market environment. The review found that a majority of policies are information measures, notably nutrition education in schools, social marketing, advertising controls, and labeling (Eat Well, 2009). The most common intervention was regulation of school meals, followed by Government action to encourage the private sector to improve diets (e.g. limiting processed foods) (Eat Well, 2009). Interventions that were found to be less common are fiscal incentives, nutrition-related standards and measures to improve healthy food availability for disadvantaged consumers (Eat Well, 2009).

Through the review of all nutrition policy interventions, informed choice was determined to have a small effect on healthy eating; but was more cost-effective. Informed choice was also found to be misconstrued with other factors that influence healthy and unhealthy eating choices, such as advertising, social marketing, nutrition education, and nutrition labeling. The market environment measures have the potential to change diets and social costs of unhealthy eating; are found to be cost-effective; but are most likely not easily accepted by the public. This review may not provide support regarding reduction in red and processed meat consumption specifically; however, it provides some supporting evidence regarding nutrition policy

interventions and healthy eating. There is a need for more similar studies to be conducted to ensure the evidence is sufficient and to mend the gap.

Interpretation

The majority of evidence that was found relating to the present study coupled the benefits of red and processed meat reduction for human health along with environmental health. Articles that were most effective within the review of the current study provided evidence that all who reduced their red and processed meat intake benefited their own health and the environment (Springmann, et. al, 2015; Macdiarmind, et. al, 2012; Clonan, et. al, 2014). Other good articles stated that finding other sources of protein, limiting red and processed meat intake, and transitioning towards plant-based diets are the most beneficial (Machovina, et. al, 2015; Tuso, et. al, 2013; Asher, et. al, 2014). One specifically adds that some people who reduce their red and processed meat intake not only do it for their own health, but for their own moral beliefs (Zur & Kockner, 2014). This finding can be used as another means to convince people to reduce their red and processed meat consumption.

Minimal studies were conducted relating specifically to best practices that were utilized to reduce red and processed meat consumption. Other studies to be considered valuable are those that provide best practices that were successful in improving healthy eating behaviors. The healthy eating behaviors discussed in these studies all expressed the importance of staying within the dietary recommendations for meat consumption. Any meat intake greater than the dietary recommendations would be considered overindulgence and; therefore, may increase the risk of developing diseases and/or cancer.

Even though there were a majority of articles supporting evidence in regards to human and environmental health with red and meat consumption, there were other studies found to have

good evidence. Other articles that had promising results and evidence were those that adopted meat alternatives and plant-based diets, along with reducing/limiting meat in every day diets and implementing an educational intervention (Wellberry, 2016; Baker & Dagevos, 2012). If these methods were shown to be effective, these methods can be used within educational plans for patients and also provide a starting point to continue with research within this problem. One of the children studies articles provided evidence regarding the effectiveness of partially replacing meat in students' diets (Dowswell, et. al, 2012).

A couple of the studies that focused on the impact physicians have on their patients are other articles that really add to the effects physicians can make in just a visit with their patient (Wellberry, 2016; Tuso, et. al, 2013). This study provides a best practice that has been done to help patients reduce their meat consumption. The evidence may not be as strong, but it still provides a method for interventions to take place in helping people reduce their red and processed meat consumption.

The rest of the studies are not as strong or effective in providing the evidence specifically to encourage a reduction in red and processed meat consumption. This provides us with the notion that there is a need for further research to be conducted particularly for best practices to help reduce red and processed meat consumption.

The rest of the studies would not be considered useless within the present study; the results can be used within the educational plan and patient brochures for health care professionals to utilize and distribute. The following information is found to be useful from the other studies:

- the need for more patient education on healthy eating habits and the benefits of reducing red and processed meat consumption
- the need to raise awareness of the health effects of high red and processed meat consumption
- identified motivators to reduce red and processed meat consumption
- nutrition-based school curriculum is effective, but not specific in reducing red and processed meat consumption
- multiple factors and methods used when implementing interventions to reduce red and processed meat intake were found to be beneficial for some people
- an intervention was identified as having some effect on helping people reduce their red and processed meat intake; however, the control group (no intervention implemented) outweighed the benefits of the intervention group
- the pilot study involving University students with an educational intervention to replace meat in the diet with non-meat alternatives was effective in helping students reduce their intake by 50%

After reviewing all of the evidence, findings, and recommendations of the studies, it demonstrates a need for further research regarding best practices that help people reduce their red and processed meat consumption. The results of the studies can be used as a guide for future research and gives hope that these studies may create a bridge to complete this gap of research related to this issue.

Outcome/Dissemination

The deliverable product is an educational plan used by healthcare professionals during patient visits to encourage patients to reduce red or processed meat consumption (see

Appendices). This plan consists of the key findings and points of evidence found throughout the review of literature, along with additional information that encourages a reduction in red and processed meat intake. The plan includes a patient brochure (see Appendices) to be provided to the patient for take-home material and also distributed in waiting areas, patient rooms, and providers' offices. Both the educational plan and brochure assist with increasing awareness and knowledge regarding the effects of red and processed meats on health, including environmental health. Patients can keep track of their food intake by completing food diaries and have their provider review them with every visit. This can determine if there is a decrease in red and processed meat consumption.

Following patient education and dissemination of the brochure, a short survey can be provided to patients by the provider for completion to determine if they have changed their meat consumption behaviors (see Appendices). This survey is an additional method of evaluation to determine if patients are reducing their red and processed meat intake.

Collection and review of the food diaries and post-surveys are both forms of evaluation to determine if this educational plan is effective in helping people reduce their red and processed meat consumption. Surveys should include an opportunity for patients to make recommendations, comments, and ask questions as needed to help with possible modifications the educational plan may need in the future.

Implications for nursing

The importance of the present study and educational plan/patient brochure can be implemented or considered to play a viable role in the different aspects of nursing. Each aspect of nursing is affected and entails its own recommendations based on the review of literature.

Nursing practice

Nurses should consider and incorporate this plan within their day-to-day patient care, especially with every patient visit. Nurses have the opportunity to educate the patients regarding the most current evidence with this study and the educational plan providing just that. The educational plan should be utilized to encourage patients to reduce their red and processed meat consumption to inspire healthier eating habits. This opportunity can also be utilized to educate patients regarding the environmental effects high production and consumption of meat has on the earth.

Nurses can also use the TTM, or stages of change, as a guide to identify the patient's readiness to change a behavior such as decrease their red and processed meat consumption. Once the nurse identifies the stage of change the patient is currently in, the nurse can then develop a plan of care that is individualized to meet the patient's educational needs. The nurse should also provide nonbiased support and encouragement for the patient to assist with the possibility of a transition from one stage to another.

Nursing education

Nursing practice is not the only aspect to consider regarding the impact of this study, nursing schools should consider providing a class or lecture on the importance of assisting their patients in reducing their red and processed meat intake. This course or lecture should include the health risks high amounts of red and processed meats impose on their patients' lives, along with effective interventions and strategies in reducing overall meat consumption.

Nursing policy

Another aspect of nursing that should be considered with this study is policy change or the opportunity to create a policy. Nurses and other health care professionals are providing patient care and education on a regular basis and what better way to help encourage patients to adopt healthy habits then to practice the healthy habits. Healthcare facilities/agencies can model healthy behaviors by implementing a "Meatless Monday" campaign within their cafeteria's. This campaign can then be distributed throughout the community by being implemented into local restaurants, schools, universities/colleges, and other worksites. Providing this opportunity may influence patients to adopt the healthy changes to their own diets.

Nursing research

After reviewing the literature, there is a need to conduct more studies in regards to meat consumption and children, along with policy interventions. Other studies that should be considered would involve other effective interventions specific in reducing red and processed meat consumption. Other studies to consider are those that involve incorporating the "Meatless Monday" campaign and testing the effectiveness of patient adherence.

More studies need to be completed in regards to best practices that help people reduce their red and processed meat consumption. There is some research done within this realm; however, more needs to be completed to support the importance of this study and improvement of individual health. The results of this literature review may be used as a guide for further research.

Conclusion

With the burden of chronic illnesses effecting patients, every avenue of prevention needs to be considered. One habit that increases the risk of developing such diseases is unhealthy eating. Americans are known for large portions and our red and processed meat consumption has continued to rise throughout the years. There have been studies indicating the harmful effects and risks that high consumption of red and processed meat imposes on overall health. It is the job of healthcare professionals to educate patients on current, evidence-based information to help them live healthier, including ways to help them reduce their red and processed meat consumption.

After review and an analysis of the literature identified for this study, it was found that the majority of the evidence supported the benefits of human and environmental health was best by reducing red and processed meat consumption. Meat reduction was done by limiting meat consumption, replacing meat with meat alternatives, adopting plant-based diets, and thinking of the effect meat production has on the environment. The educational intervention identified as successful in one study is a great addition to the end product of the present study: educational plan and patient brochure. This plan and brochure can be used universally and provides a way of increasing the awareness of this problem.

Other information found through the studies is beneficial, but not specific to red and processed meat intake. There is a need for further research of studies specific to red and processed meat consumption and best practices to help reduce it and to fill the gap.

Nursing implications to help guide use of the study include: utilizing the plan and brochure within nursing practice; providing a lecture/class on this growing problem, along with effective interventions; and modeling healthy behaviors identified in the study within

workplaces, such as implementing "Meatless Monday" within local health care facilities, schools, universities, and restaurants. With nurses taking the step towards "living by example", it may provide the patient with the encouragement and motivation they need to adopt new healthy changes within their lives.

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Appendix A

Educational plan

educational plan.pptx

(please see attached)

Appendix B

Patient brochure

patient brochure.pub

(please see attached)

Appendix C

Post-education survey

This survey is used to identify areas of improvement and to also help us provide quality services to our patients. It is completely voluntary and you may refuse to answer any questions you don't feel comfortable answering.

1. Did you understand the material your provider went over with you regarding meat consumption? (circle your answer)

Yes No

2. If you checked "No" for number 1, why or what didn't you understand? Please explain below:

_____
_____
_____
_____
_____

3.After you received the information regarding meat consumption, did you reduce your meat intake? (circle your answer)

Yes No

3a. Why or why not? Please explain below:

_____
_____
_____
_____
_____

4.If you reduced your meat intake, what types of meat did you reduce in your diet? Check all that apply:

☐ Red meat (examples: steak, hamburger, pork chops, lamb)

☐ Processed meat (examples: hot dogs, bologna, luncheon meats, spam, potted meat, bacon, ham, salami, sausages)

4a. Did you reduce more of 1 type of meat? (circle your answer)

Yes No

4b. If so, name the meat(s):_____
_____
_____

5. Are you planning on changing or continuing with the change of reducing or eliminating your meat intake? (circle your answer)

Yes No

6. Would you encourage other people to reduce their meat consumption? (circle your answer)

Yes No

7. Any additional comments, questions, advice or recommendations?

_____

_____

_____

_____

_____

Encourage your patients to reduce their meat consumption now!

Why should I add this to my to-do list?

- Recent studies show the higher amount of red and processed meat people consume, the greater the risk of developing diseases such as heart disease, kidney disease, osteoporosis, and/or cancer (Meatless Monday, 2013).
  - Harvard Health Publications (2012), confirms this with a study they conducted that indicated if a person consumed additional servings of red meat, it increased the person's risk of death by 13%; if the meat consumed was processed, it was increased by 20%.

Continued…

- Health benefits:
  - Limit cancer risk
  - Reduce heart disease
  - Fight diabetes
  - Curb obesity
  - Live longer
  - Improve your diet
- Chronic disease treatment is costly
- Prevention is a money-saver and, overall, helps us provide optimal care to our patients

Continued…

- Provides health benefits for not only our patients, but for the environment as well
  - Meat reduction or elimination does the following for the environment:
    - Reduces carbon footprint
      - Meat industry generates nearly one-fifth of man-made greenhouse gas emissions that are accelerating climate change worldwide (greater than transportation)
      - The demand for meat continues to grow

Continued…

- Minimizes water usage
  - An estimated 1,800 to 2,500 gallons of water go into a single pound of beef; tofu production requires 220 gallons of water per pound (Meatless Monday, 2013).
- Reduces fossil fuel dependence
  - It takes about 40 calories of fossil fuel energy of every calorie of feed lot beef in the U.S.; 2.2 calories of fossil fuel energy is needed to produce one calorie of plant-based protein (Meatless Monday, 2013).

Review of literature

- Included 15 articles that focused on identifying best practices to assist patients with reducing their red and processed meat consumption

Continued…

- Red meat
  - Beef, pork, lamb, hamburger
- Processed meat
  - Hot dogs, sausage, salami, bologna, luncheon meats, SPAM, potted meat, bacon, ham

Continued…

- Articles that were most effective within the review provided evidence that all who reduced their red and processed meat intake benefited their own health and the environment
  - Most beneficial practices:
    - Finding other sources of protein rather than just meat
    - Limiting red and processed meat intake rather than eliminating
    - Transitioning towards plant-based diets (i.e. Mediterranean Diet or Vegetarian)

Continued…

- Additional effective practices:
  - Adopting meat alternatives and plant-based diets
  - Reducing/limiting meat in every day diets and implementing an educational intervention
- Other findings indicated:
  - The importance of staying within daily dietary recommendations for meat consumption
  - People may reduce meat intake due to their own moral beliefs
  - Partially replacing meat within the diets of children is effective

Continued…

- Need for more patient education on healthy eating habits
- Need to raise awareness of the health effects of high red and processed meat consumption
- Physicians have a great impact on their patients during every encounter
- There is a great need for further research regarding best practices and the reduction of red and processed meat consumption

Meatless Monday Campaign

- International movement to help reduce meat consumption to improve individual health and environmental health
  - Associated with Johns Hopkins Bloomberg School of Public Health
- Found in 24 countries
  - Supported by celebrities, media, schools, restaurants, and communities
- Provides information and recipes for people who are willing to commit to not eating meat one day out of the week
  - Remove meat from the diet on Mondays' and replace it with nutrient-rich fruits, vegetables, beans, and whole grains

Continued…

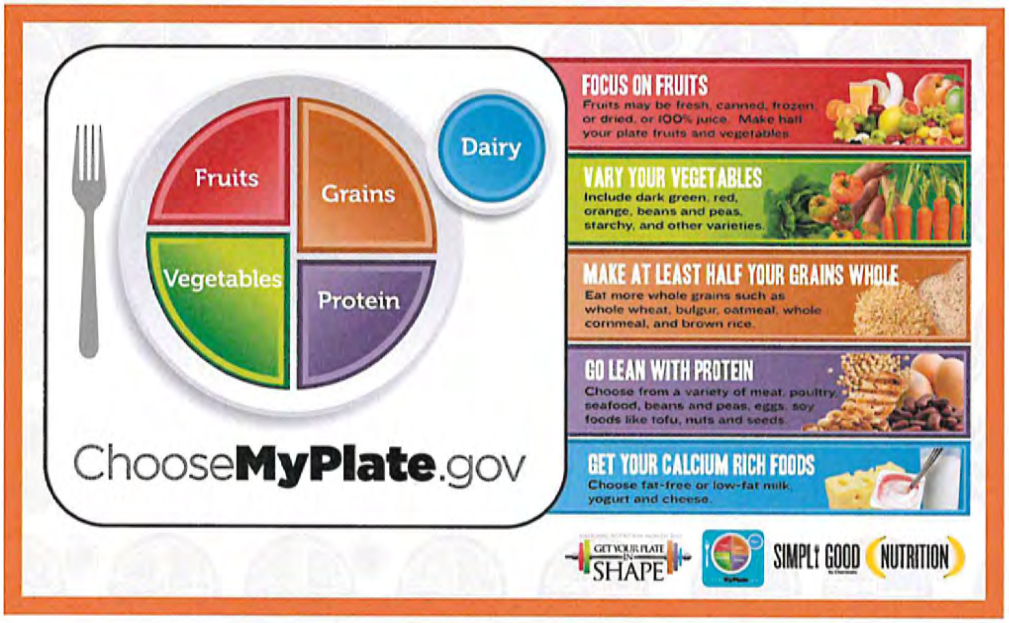
- Meatless Monday encourages people to:
  - Start a pledge drive (i.e. pledge to go meatless and get others to volunteer)
  - Reach out to the media (i.e. local newspapers)
  - Get restaurants involved (i.e. encourage local chefs to promote a Meatless Monday dish or menu to help attract customers on Mondays)
  - Contact farmers' markets (i.e. encourage market organizers to support Meatless Monday to increase business and promote healthy eating)
  - Encourage schools to go meatless on Mondays
  - Ask hospitals
  - Don't forget your own workplaces

Individualize Plan of Care

- Complete a short assessment/questionnaire regarding meat consumption
  - How much meat do they consume on a daily basis or weekly basis; what types of meat do they consume (may need to provide examples or definitions)
- Identify areas for patient education
- Provide patient education where needed the most
  - Effects of high red and processed meat consumption
  - MyPlate (see the next slides for MyPlate)

MyPlate

- A reminder to find a healthy eating style and build it throughout a lifetime by encouraging the following:
  - Focus on variety, amount, and nutrition.
  - Choose foods and beverages with less saturated fat, sodium, and added sugars.
  - Start with small changes to build healthier eating styles.
  - Support healthy eating for everyone.



http://insanemedicine.com/wp-content/uploads/2014/11/NNM_MyPlate_Placemat_2.jpg

Continued…

- Daily recommendations for fruit intake

	Age	Amount
Women	19-30 years old	2 cups
	31-51+ years old	1 ½ cups
Men	19-51+ years old	2 cups

Continued…

- Daily recommendations for vegetable intake

	Age	Amount
Women	19-50 years old	2 ½ cups
	51+ years old	2 cups
Men	19-50 years old	3 cups
	51+ years old	2 ½ cups

Continued…

- Daily recommendations for intake of grains

	Age	Amount
Women	19-50 years old	6 oz
	51+ years old	5 oz
Men	19-30 years old	8 oz
	31-50 years old	7 oz
	51+ years old	6 oz

1 oz = 1 slice of bread; 1 cup of cereal; ½ cup of cooked rice; ½ cup of cooked cereal; ½ cup of cooked pasta

Continued…

- Daily recommendations for protein/meat intake

	Age	Amount
Women	19-30 years old	5 ½ oz
	31-51+ years old	5 oz
Men	19-30 years old	6 ½ oz
	31-50 years old	6 oz
	51+ years old	5 ½ oz

1 oz= 1 oz meat, poultry, or fish; ¼ cup of cooked beans; 1 egg; 1 tablespoon of peanut butter; ½ oz of nuts or seeds

Continued…

- Daily recommendations for dairy intake

	Age	Amount
Women	19-51+ years old	3 cups
Men	19-51+ years old	3 cups

Continued…

- Daily recommendations for oils/fats intake (includes oils you cook with, dressings you add to salads, mayonnaise)

	Age	Amount
Women	19-30 years old	6 teaspoons
	31-51+ years old	5 teaspoons
Men	19-30 years old	7 teaspoons
	31-51+ years old	6 teaspoons

Individualize Plan of Care Continued…

- Utilize transtheoretical model (TTM) to decide level of readiness and/or what stage they are currently in
  - Pre-contemplation (person may or may not be aware that they have a behavior problem; not willing to change or have no intention of changing)
  - Contemplation (person realizes they have a problem and are thinking of making a change within the next 6 months)
  - Preparation (person preparing themselves to start their change within the next four weeks)
  - Action (the person makes the behavior change and will continue until they have maintained the change within the next six months)
  - Maintenance (person maintains and continues through the change for the full six months)

Continued…

- Identify which best practice (within the review of literature) will be most effective for the patient
  - Follow the following link for recommendations for Mediterranean and Vegetarian diets: https://health.gov/dietaryguidelines/2015/guidelines/appendix-4/
- Set goals
  - Small goals are most successful
  - Provide patient with a food diary
  - Encourage Meatless Monday
- Schedule a follow up visit
  - Have patient complete post-survey at this follow up visit

References

- Harvard Health Publications. (2012). *Cutting red meat-for a longer life.* Harvard Medical School. Retrieved from: http://www.health.harvard.edu/staying-healthy/cutting-red-meat-for-a-longer-life
- Horwath, C.C. (1999). Applying the transtheoretical model to eating behavior change: Challenges and opportunities. Nutrition Research Reviews 12(2): 281-317. Doi: https://doi.org/10.1079/095442299108728965
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- U.S. Department of Health and Human Services and U.S. Department of Agriculture. (2015). *2015 – 2020 Dietary Guidelines for Americans.* 8th Ed. Retrieved from: http://health.gov/dietaryguidelines/2015/guidelines/.
- Zur, I., & Klöckner, C. A. (2014). Individual motivations for limiting meat consumption. *British Food Journal, 116*(4), 629-642. DOI: 10.1108/BFJ-08-2012-0193

VISIT WITH A PROVIDER

Talk with your doctor, nurse, or dietitian regarding reducing your meat consumption. They can give you the tools needed to balance a healthy meal plan.

References:

Harvard Health Publications. (2012). *Cutting red meat for a longer life*. Harvard Medical School. Retrieved from: http://www.health.harvard.edu/staying-healthy/cutting-red-meat-for-a-longer-life

Meatless Monday. (2013). *Meatless Monday in Your Community*. The Monday Campaigns, Inc. Retrieved from: http://www.meatlessmonday.com/meatless-Monday-community/

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Take this brochure for yourself, your family, and your friends!

High Meat Consumption: Reduce your risk now!

- Recent studies show the higher amount of red and processed meat people consume, the greater the risk of developing diseases such as heart disease, kidney disease, osteoporosis, and/or cancer (Meatless Monday, 2013).
- For every additional serving of red meat you consume, your risk of death increases by 13%; if this meat is processed, your risk of death increases to 20% (Harvard Health Publications, 2012).

Red meat=beef, pork, lamb, hamburger

Processed meat=hot dogs, sausage, ham, bacon, salami, luncheon meat, SPAM, potted meat

Why reduce your meat consumption?

Health benefits include:

⇒ Limit cancer risk

⇒ Reduce heart disease

⇒ Fight diabetes

⇒ Curb obesity

⇒ Live longer

⇒ Improve your diet

Improve the health of the environment you live in. Don't you want your children to grow up in a safe, clean environment?

Reducing meat consumption helps the environment by: reducing your carbon footprint; minimizing water usage; helping reduce fossil fuel dependence

WHERE TO START?

Start with one day a week. Have you heard of Meatless Monday?

Meatless Monday is an international movement to help reduce meat consumption to improve your health and environmental health

- Associated with Johns Hopkins Bloomberg School of Public Health
- Found in 24 countries!
- Supported by celebrities, media, schools, restaurants, and communities

WHAT DO YOU DO?

You don't eat meat on Mondays by replacing it with nutrient-rich fruits, vegetables, beans, and whole grains

Meatless Monday has a website for more information and weekly recipes: http://www.meatlessmonday.com/

FOLLOW THE MYPLATE METHOD

—Focus on variety, amount, and nutrition

—Choose foods and beverages with less saturated fat, sodium, and added sugars

—Start with small changes to build healthier eating styles

—Support healthy eating for everyone

—Don't eat over daily recommendations, especially with meat intake!

Daily recommendations vary by age, gender, and physical activity. For more information or for daily recommendations please visit the