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A COMPARATIVE ANALYSIS OF THE KETOGENIC, PALEOLITHIC, AND
VEGAN DIETS AND THEIR BENEFITS AND LIMITATIONS

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Abstract

The obesity epidemic in America costs the healthcare system hundreds of billions of dollars every year and takes a toll on the physical and mental health of the patient. Analyzation of different weight loss methods allows healthcare providers to provide accurate and relevant education to patients who are suffering from obesity. A search for the paleolithic, ketogenic, and vegan diets, resulted in fifty-four scholarly studies via purposive sampling. Data was collected on the paleolithic, ketogenic, and vegan diets and all had conclusive positive effects on weight loss. Individuals studied on the paleolithic diet lost up to 2.3 kg in three weeks, those on the vegan diet lost up to 1.2 kg in seven days, and those on the ketogenic diet had an average weight loss 13.7 kg in one year.

The paleolithic, ketogenic, and vegan diets all have been evidenced to aid in weight loss, but they differ in specific health benefits and limitations. The paleolithic diet was found to have ten advantages and eleven disadvantages, the vegan diet showed fourteen advantages and five disadvantages, while the ketogenic diet showed fourteen advantages and six limitations. Ultimately, dietary recommendations should depend on the patient and their specific health requirements. Limited data on long-term effects should caution health care providers as to recommending these diets for extended periods. Nurses should advocate for patient care by promoting nutritional changes in collaboration with dieticians and health care providers in developing dietary interventions for effective management of obesity and its associated complications. In doing, nurses will promote a longer and healthier life for individuals, and as a result a healthier America.

Introduction

Each year it is estimated that approximately 45 million Americans try some variation of a diet. Around \$33 billion is spent on weight loss products alone. Despite efforts to change these numbers, obesity affects nearly two-thirds of the American population. Obesity is a chronic disease that requires medical attention and lifelong care. Those who are overweight are at a significantly higher risk for numerous health problems such as diabetes, stroke, heart disease, high cholesterol, high blood pressure, sleep apnea, and osteoarthritis, which may lead to further diseases and health complications (Weight Management, 2017).

The medical cost of obesity in the United States was \$147 billion in the year 2008, and the healthcare expenses for an obese person is on average \$1,429 more than those who have a healthy weight (Overweight & Obesity, 2017). The rising obesity epidemic in America is largely related to poor nutrition, and it has left many overweight patients with the desire to change their eating habits. In this comparative analysis, the ketogenic, paleolithic, and vegan diets will be compared and contrasted on their benefits and limitations on the human body. These are just a few of the diets that have been of recent interest and popularity among the American population.

Background

Dietary control is the fundamental element in obesity prevention and reduction. The pertinence of this study is rooted in the many complications that healthcare workers see with obesity as a result.

Complications of Obesity

Obesity creates an increase in the body's adipose tissue, which can lead to a variety of medical problems related to several body processes as well as metabolic diseases like insulin resistance, type 2 diabetes, dyslipidemia, and fatty liver disease (Jung & Choi, 2014). Patients suffering with excess weight can have problems with immobility, skin breakdown, respiratory challenges, moisture retention, friction, and decreased tissue perfusion. These complications directly affect nursing practice in the hospital as well as in home health care (Lowe, 2009).

Immobility in obese individuals can lead to pressure ulcers because of increased weight on bony prominences with decreased energy for repositioning, (Pierpont et al., 2014). Increased skin folds, perspiration, and surface area create hospitable environments for fungal, bacterial, and viral growth while increasing friction against skin. These circumstances all lead to skin breakdown, which can directly relate to impaired healing because the body's lower blood supply in the presence of high adipose fat cells (Pierpont et al., 2014).

Overweight patients have a higher risk of Type II Diabetes. This disorder refers to the illness related to islet β -cells in the pancreas, which significantly increases the risk of renal disease, heart attacks, and strokes. In type II diabetes, the pancreas cannot secrete adequate insulin levels to match and regulate the levels of blood sugar in the body, (Kahn, Cooper, Del Prato, 2014). One of the largest risk factors for type 2 diabetes is increased abdominal fat which relates to poor diet and exercise. Over 87% of Americans

who have diabetes are overweight, indicating that poor weight management contributes to the diagnosis of type 2 diabetes (NIH, 2015).

According to the American Heart Association, obesity is a major contributor to hypertension and accounts for 65-75% of the risk for primary hypertension. An overweight patient has increased metabolic demands due to the raised cardiac output required to feed excess adipose tissue. Prolonged obesity can lead to uncontrolled hypertension, which may require the prescription of multiple antihypertensive drugs. This could increase the patient's chances of experiencing medication side effects and adverse reactions (Hall, do Carmo, da Silva, Wand, & Hall, 2015).

Common respiratory challenges occur in obese populations and include sleep apnea, obesity hypoventilation syndrome (OHS), and decreased functional residual capacity and expiratory reserve volume. Doctors tend to have more trouble visualizing the trachea during intubation in obese patients because the fat deposits around the neck adds pressure on the internal structures (Camden, 2009). Due to possible complications that may arise in an emergency, special respiratory precautions must be made for obese patients.

Immobility in extremely obese patients affects the patient, family, and healthcare team. It is important for healthcare professionals to practice personal and patient safety measures when lifting or maneuvering obese individuals. Specialized equipment may be needed for comfortable patient care and nurse safety (Choi & Brings, 2016). Equipment used includes a Hoyer or hydraulic lift. Immobility leads to a plethora of complications,

including deep vein thrombosis and pressure ulcers, which lead to impaired healing due to inadequate perfusion (Pierpont et al., 2014).

Obesity holistically leaves a patient with not only physical, but mental, and spiritual difficulties as well. A ten-year study on obesity among Americans concluded that, “the prevalence of weight/height discrimination increased from 7% in 1995-1996 to 12% in 2004-2006,” (Andreyeva, Puhl, & Brownell, 2008, p. 1129). Obesity negatively affects a patient’s self-perception and body image, which may worsen in social settings, leading the patient to further seclusion and depression.

Weight loss is a prevalent issue in American culture today, indicating the need for proper education on trending diets to best meet the individual’s specific health care concerns. Medical problems related to obesity include skin breakdown, type II diabetes, and hypertension. Choosing an effective weight loss diet plan can alleviate several symptoms related to these illnesses and even decrease the risk of acquiring them altogether. Therefore, it is important to have an accurate and thorough understanding of the benefits and limitations behind popular diets, including the ketogenic, paleolithic, and vegan diets.

Ketogenic Diet

In the 1920s, the ketogenic diet was used to “effectively control seizures in refractory childhood epilepsy” (Moore & Westman, 2014, p. 31). This type of epilepsy was proved unmanageable by medication regimen, and therefore further lifestyle measures were needed to control the seizure activity. This diet originated from Dr. Russel Wilder, who researched how fasting decreased seizure activity. He developed a diet that

mimicked the metabolic effects of fasting by inducing ketosis (Randall & Groveman, 2016). Wilder found that when a body is in ketosis, “the ketone bodies replace glucose as the major source of energy,” which mimics the effects of fasting (Randall & Groveman, 2016, p. 42). The liver produces ketone bodies from the fatty acids consumed and replaces glucose in cellular metabolism to create energy for the body without using glucose due to the very minimal intake of carbohydrates (Randall & Groveman, 2016). Although this diet was formally intended to control seizures, it was also found to have additional health benefits such as weight loss, decrease blood pressure and cholesterol, and decrease anxiety (Moore & Westman, 2014).

The ketogenic diet specifically focuses on a low amount of carbohydrates, high amounts of fat, and an adequate amount of proteins (Gildea, 2017). The parameters are to eat between 75-80% of calories in fats, 10-15% in protein, and 5-10% in carbohydrates per day (Moore & Westman, 2014). The goal is to get the body into a state of ketosis. The most reliable way to do this is to lower carbohydrate intake to 30 grams or less per day, while only consuming 0.5 grams of protein per pound of body weight, and consuming high amounts of fat throughout the day. These fats can come from animal sources like butter, heavy whipping cream, and fatty meals (Moore & Westman, 2014).

The ketogenic diet can be difficult for individuals who consume typical American diets that are centered around carbohydrates. More recently, brands have created foods that are normally high carb, like a loaf of bread, to be keto friendly. A meal plan might include: an egg and sausage scramble with a side of avocado for breakfast, a cilantro

chicken salad with coconut cream for lunch, and a cauliflower crust pizza with meat and vegetable toppings for dinner.

Today the ketogenic diet is being used for weight loss rather than just for seizure control due to diet changes of lower consumption of carbohydrates. In addition to the diet promoting weight loss, there are additional health benefits to the diet that can help prevent chronic diseases such as diabetes, cardiovascular disease, or hyperlipidemia (Paoli, Rubini, Volek, & Grimaldi, 2013).

Paleolithic Diet

The paleolithic diet was founded by Walter Voegtlin, a gastroenterologist who authored the book “The Stone Age Diet”. In his writings, he describes that man left his meat and fat diet only a few thousand years ago, largely because of a rapidly growing human population and a decreasing number in animals due to climate changes. Voegtlin claims that man began to consume plant substances, or carbohydrates, to satisfy his hunger. As time went on, man added more and more carbohydrates to his diet and “stopped eating from hunger and began eating for fun...As carbohydrate foods became more prominent, he suffered certain consequences from his dietetic tampering, not the least of which was obesity” (Voegtlin, 1975, p. 7).

The Paleolithic diet, also known as “Paleo”, is considered to be a “caveman” or “stone-age” diet because it is based on an original hunter-gatherer lifestyle. It mimics the diet of man’s ancestors, who supposedly did not suffer from the same extent of diseases that plague mankind today. This diet suggests that the body is genetically incompatible with the modern diet that resulted from farming, which introduced dairy, grains, and

legumes to man's nutrition. According to the "discordance hypothesis", the body was not able to adapt to this relatively late modification, which is now believed to be a major contributor to obesity, diabetes, and heart disease ("Choose Your Carbs", 2017).

The Paleo diet is not so much based on the amount of food consumed but rather the quality of it, since it includes foods that were available before the establishment of agriculture. The main foods consumed on this diet include wild animals, plants, lean meats, fish, eggs, vegetables, fruits, nuts, and seeds. Foods to avoid include grains, legumes, dairy products, refined sugar, and processed oils, all of which were unavailable to man before the time of farming and agriculture. Studies suggest that this diet is beneficial in lessening obesity and metabolic syndrome (Klonoff, 2009).

Loren Cordain is a specialist in nutrition and a strong advocate for the Paleo diet. In his book *The Paleo Diet: Lose Weight and Get Healthy by Eating the Foods You Were Designed to Eat*, Cordain outlines the ratio of macronutrients a person should consume each day. He encourages 22 to 40% of a daily calorie intake to come from carbohydrates (as opposed to the 45 to 65% recommended by the National Academy of Sciences) and emphasizes consumption of fresh, organic fruits and vegetables, which contain fiber and other important nutrients, to fulfill the body's carbohydrate needs. Protein intake should fall between 19 and 35% of daily calorie intake (as opposed to the 10 to 35% recommended by the National Academy of Sciences) and should center around grass-fed and cage-free lean meats and fish, as well as nuts and seeds. Cordain stresses that 28 to 47% of daily calories should come from fat (as opposed to the 20 to 35% recommended by the National Academy of Sciences), specifically unsaturated fats, although a moderate

amount of saturated fat can be consumed from meat (Cordain, 2011; “Dietary Reference Intakes”, 2018).

The average American diet can be easily made paleolithic with the right resources and knowledge. Traditional waffle or pancake batters can be substituted with grain-free recipes that use almond flour and tapioca starch in place of regular flour. Lunch and dinner options might include chicken wrapped in lettuce or even baked salmon.

Today the paleolithic diet is used for weight loss and other health benefits due to a decreased consumption of carbohydrates and an increased consumption of organic meats, fruits, and vegetables from man’s ancestral lifestyle. These diet modifications aim to promote health benefits that mirror the health of man’s ancestors.

Vegan Diet

The Vegan diet has been gaining popularity as the diet largely stems from the desire to properly utilize the environment and natural resources. It is followed by individuals for health and/or ethical reasons. Veganism dates back to the 1800s, originating in ancient Eastern culture. Faithful Hindus, Buddhists, and Jainists are adamant vegans, promoting the safety and well-being of the animals. Vegans hold to a plant-based diet, eliminating the consumption of meat, fish, eggs, and dairy, whey, honey or any other animal by-products (Suddath, 2008).

The vegan diet has slowly gained popularity in the West. The first vegetarian society, which gave birth to veganism, began in England in 1847. Years later, upon the discovering tuberculosis in 40% of English cows, the term “vegan” was coined to define a more extreme sort of vegetarianism. Though veganism has now gained popularity for

its health benefits, its origins are rooted in a respect for animals and the environment (Suddath, 2008).

Veganism has moved beyond just the dietary spectrum into a lifestyle. Veganism has evolved to completely abstain from using any animal products whether it be leather, wool, fur, silk, eggs, gelatin, or honey (Mann, 2014). Veganism proposes making conscious decisions that not only affect the individual, but also the world around them. The American Vegan Society website has described it as a “grassroots nonviolent revolution fueled by independent thought.” Over the past few years, veganism has taken a new spotlight among celebrities and popular culture with stars like Beyoncé and Ellen DeGeneres advocating for the diet. With its rising popularity, people are now considering a vegan diet for weight loss and maintenance. However, the benefits and risks must be carefully analyzed before shifting to any dietary change, especially when such a large group of foods is eliminated. The proposed benefits are added vitamins and minerals, while consuming less calories and saturated fats, which lowers blood pressure and cholesterol. In turn, the diet claims to reduce the risk of heart disease, diabetes, and even some cancers (Cronise & Hever, 2017).

The rising popularity of veganism has greatly expanded the scope of recipes and items conveniently available for this diet. Breakfast can be a tofu scramble, in lieu of scrambled eggs, and a fruit smoothie. Lunch options could include vegetable sushi roll or a roasted tomato soup. Dinner could be a black bean burger with a side of sweet potato fries.

Although the vegan diet stemmed from respect for the planet, there are now many claims on the positive health effects of the lifestyle. Many people are now turning to this style of eating in order to achieve their goals of better health.

All three of the preceding diets have been used as weight loss strategies in the US. These diets all vary in what should and should not be consumed but all have weight loss benefits and other health assets. The paleolithic focuses on “pre-agricultural foods” which the human body is supposedly more accustomed to. The vegan diet rejects all foods and products which come from animals, which would lead to a higher carb and fat intake. Collectively, the risks and benefits of each diet will be weighed using evidence-based research, providing a comparative study of the three popular diets.

Significance

Nurses are constantly adapting their caregiving strategies based on what is most beneficial for the patient. Professionals can expect to see those who are overweight not only in bariatric centers for weight loss, but in almost every other sphere of healthcare. Physical size changes how interventions must be implemented and can complicate the most basic nursing interventions. Even basic nursing care of patients who are obese is challenging. Concerns arise related to “skin care, respiratory challenges, assessment and resuscitation measures, altered drug absorption, intravenous access, and immobility” (Camden, 2009, p. 4).

Diet plans and nutritional strategies can play key roles in illness prevention, disease control, and rehabilitation. Health professionals provide overweight clients and pre-diabetics with great incentive to alter their diets in order to avoid expensive

medications, surgeries, and other treatments. These may be needed due to the complications that arise with unhealthy nutrition habits, obesity, and poor cardiac health. However, diets can be costly, requiring consumers to spend money on specialized nutritional products, supplements, and foods.

The Harvard School of Public Health discovered that diets considered to be the most effective cost about \$1.50 more per day than diets considered to be less healthy. In one year, a person would spend approximately \$550 more on food for a healthy diet per person, which could present a burden for low income families. This expenditure increase could be the difference between a healthy lifestyle and chronic disease (“Eating Healthy vs. Unhealthy Diet Costs About \$1.50 More Per Day”, 2014). This increases the need for educating the public on the diets that can effectively and, ideally, economically produce results.

Diets must be both cost effective and produce desired health outcomes. It is important to compare these three popular diet plans and analyze their respective outcomes. Those who want to make educated decisions on the improvement of their health and nutrition while avoiding unnecessary costs must be able to weigh the advantages and disadvantages of each plan to see which would provide the results they desire.

Purpose Statement

The paleolithic, ketogenic, and vegan diets examined in this comparative study are a select few out of the various trending popular American diets. The purpose of this comparative study is to analyze evidence-based research on the benefits and limitations

of the ketogenic, paleolithic, and vegan diet plans. This will allow for individuals and their health-care providers to make an informed decision regarding their lifestyle and choice of weight loss diet to prevent, maintain, and improve overall health. Therefore, this research seeks to answer the question, “What are the health benefits and limitations of vegan, ketogenic, and paleolithic diets?”

Definition of Variables

The variable of this study is the health benefits and limitations associated with the ketogenic, vegan and paleo diets. These terms will be defined below using dictionary and professional sources for clearer understanding and application.

The term “health” is defined according to Public Health Nursing by Stanhope and Lancaster as “a state of complete physical, mental, and social well-being; not merely the absence of disease or infirmity” (2014, p. 381). Health also includes health promotion, which is behavior directed toward achieving greater level of health (Stanhope & Lancaster, 2014).

A diet is stated as “a special course of food to which a person restricts themselves, either to lose weight or for medical reasons (Diet, Oxford Dictionaries, n.d.). As described in the background section of this research review, the ketogenic, paleo, and vegan diets each ascribe to a specific course of food intake intended to produce health benefits for the body by different mechanisms.

A benefit is defined as a helpful or good effect by Cambridge Dictionary, and a limitation is defined as a limited circumstance or a restriction by Oxford Dictionary (n.d.). Therefore, a health benefit is considered to be a positive effect, and a limitation is

a restriction in relation to a state of physical, mental, or social well-being as a result from an identified specific course of food. Therefore, this study analyzed the helpful, positive effects as well as restrictions on the physical, mental, spiritual wellness of individuals on the ketogenic, paleolithic, and vegan diets.

Methodology

The searches for this Systematic Research Review were conducted between February 2018 and August 2018. Databases utilized were Medline, EBSCO, and Google Scholar. Keywords included “Vegan”, “Ketogenic or Keto”, “Paleolithic or Paleo” and “Health Benefits”; “Paleolithic”, “Vegan”, “Ketogenic”, and “diet”; “Vegan”, “Ketogenic”, “Paleolithic” and “diet outcomes”; “Ketogenic diet or Keto diet”, “Paleolithic diet or Paleo diet” and “negative”. The variety of databases used, and the keywords used solely and in combination provided the most comprehensive number of hits. Limiters (inclusion criteria) were that articles had to be published within the last 5 years, full text, available in English, and taken from a peer reviewed journal. This combination of inclusion criteria allowed for the most credible and reliable information on the topic. The total number of hits from all searches was 4,207. To narrow the results, titles were scanned for relevancy. Those that did not appear to directly relate to answering the research question were excluded. If articles could not be excluded based on title, abstracts were read. Those that sounded promising in answering the research question were saved and the full text article was reviewed. Out of all the searches, 109 studies were saved for possible inclusion in the sample. Snowballing of article references was also used to find more possible sample articles. Saved articles were critiqued for quality

and if they were able to answer the research question. Once critiqued the sample size was 54.

Findings

The academic articles that contributed to answering the research question were analyzed and organized by each diet and displayed in tables. Eight of the articles were on the paleo diet, ten of the articles were on the vegan diet, and twelve for the ketogenic diet.

The benefits and limitations of the ketogenic diet were analyzed from ten different evidence-based sources. The fourteen benefits included overlapping research on decreased blood pressure, increased benefits for patients with type 2 diabetes, and increased HDL levels. Out of the six limitations, the commonalities included increased LDL levels and arterial stiffening. The other four limitations include reduction in REM sleep, interference with endothelial function, reduction of serotonin levels in the brain, and severe renal stones due to hypercalciuria.

Table 1

Ketogenic Diet Advantages and Disadvantages

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Afaghi et al.	Systematic Review, Level 1	14 male participants Healthy non-obese men aged 18-35, 23.4 +/- 1.9 kg/m	Increase in time in deep sleep stage 4	Reduction in REM sleep

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Bradley et al.	Quantitative, Level 4	24 Participants 15 females & 9 males	Weight loss (5–7% of initial body weight) & moderate physical activity resulted in a 58% reduction in the 4-year incidence of type 2 diabetes (in high-risk individuals with impaired glucose tolerance). Weight loss from central body region Peripheral insulin sensitivity significantly improved Significant reduction in triglycerides by 1.59 ± 0.55 to 0.91 ± 0.33 mmol/L post intervention	It is possible that the high fat content of a low-carbohydrate diet exerts detrimental effects on endothelial function, which raises concerns regarding the long-term safety & efficacy of low-carbohydrate diets. Possible negative effect on long term vascular health due to slight increase in systemic stiffness of arteries contributing to cardiovascular risk.
Brinkworth et al.	Systematic Review, Level 1	69 participants Men & women with abdominal obesity and at least one other metabolic syndrome.	Increase in HDL (0.23 ± 0.09 mmol/L)	Increase in LDL cholesterol (0.6 ± 0.2 mmol/L)

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Brinkworth et al.	Level 1	106 participants Overweight and obese patients mean age of 50	Weight loss mean of 13.7kg	Reduced serotonin concentrations in the brain.
Bueno et al.	Systematic Review, Level 2	13 studies, 712 participants: Male & female; mean age 50, BMI over 30, countries included AUS, USA, UK, NZ, Israel	Slight reduction in body fat with a mean of 5 kg & a 0.91 mean difference on a 95% confidence interval favoring the low carb ketogenic diet compared to low fat diet	None identified
Bueno et al.	Systematic Review, Level 2	12 studies, 627 participants: Male & female; mean age 50, BMI over 30, countries included AUS, USA, UK, NZ, Israel	Slight increase in HDL with a mean of 1.71 mmol/L, 0.09 mean difference on a 95% confidence interval of low carb ketogenic diet compared to a low-fat diet	None identified
Bueno et al.	Systematic Review, Level 2	11 studies, 652 participants: Male & female; mean age 50, BMI over 30, countries included Australia, USA, UK, NZ, Israel	Decrease in diastolic blood pressure mean of 34.99 mmHg and a 1.43 mmHg mean difference favoring the low carb diet compared to the low-fat diet	None identified

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Bueno et al.	Systematic Review, Level 2	11 studies, 652 participants Male & female; mean age 50, BMI over 30, countries included Australia, USA, UK, NZ, Israel	None identified	Slight increase in LDL with a mean of 0.21 mmol/L & a 0.12 mmol/L mean difference on a confidence interval favoring the low carb ketogenic diet compared to low fat diet
Choi et al.	Case Report, Level 1	5-year-old female	None identified	Severe renal stones due to hypercalciuria
Paoli	Quantitative, Level 1	Experimental mice	Reduction in appetite due to higher satiety effect of proteins Control hormones from appetite reduction Reduction in lipogenesis & increased lipolysis Greater metabolic efficiency in consuming fats highlighted by the reduction in the resting respiratory quotient	None identified

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Paoli et al.	Systematic Review, Level IV	109 articles reviewed General population Type 2 Diabetics for at least 4 years	Weight loss: Reduces lipogenesis and increases lipolysis Reduction in appetite: higher satiety effect: controls hormone Type 2 diabetics: HDL increased 63% LDL decreased 33% Neuroprotective effect: may help enhance regulation of synaptic function	None identified
Westman et al.	Systematic Review, Level 2	49 participants Community volunteers with obesity & type 2 diabetes	Improvements in hemoglobin A1c (-1.5) Body weight (-11.1 kg) High density lipoprotein cholesterol (+5.6 mg/dL) Diabetes medications were reduced or eliminated in 95.2%	None identified
Zajac et al.	Quantitative, Level 1	8 participants Male aged 28.3 +/- 3.9 years who compete in off-road cycling	Increases fat metabolism during exercise reducing body mass & fat content	None identified

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
			Decreased post exercise muscles damage	
			Enhances endurance in long distance exercise lasting 2 to 5 hours by slowing the rate of carbohydrate utilization.	

Eight scholarly articles were reviewed on the paleo diet resulting in ten advantages and eleven disadvantages. Some of the benefits that overlapped between the different studies included weight loss, decreased blood pressure, and increased satiety. The disadvantages that were proposed by several of the studies include the difficulty in maintaining the diet, decreased calcium intake, and the increased cost of food.

Table 2

Paleolithic Diet Advantages and Disadvantages

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Boers et al.	Quantitative; Level II	34 males & females w/ at least 2 traits of metabolic syndrome	Can lower systolic blood pressure (-9.1 mmHg)	No changes found in inflammation

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Genoni et al.	Quantitative; Level II	39 healthy women age 47 ± 13 years & BMI 27 ± 4 kg/m ²	<p>Lower diastolic blood pressure (-5.2 mmHg)</p> <p>Can reduce triglycerides (-0.89 mmol)</p> <p>Can reduce total cholesterol (-0.52 mmol/l)</p> <p>Can cause weight loss (-1.32 kg in 2 weeks)</p> <p>None identified</p>	<p>Insufficient consumption of calcium according to recommended dietary intake</p> <p>23% reported a significantly greater number of events of diarrhea</p> <p>Difficult to maintain (high compliance to both dietary patterns, although there was a trend towards an increased consumption of foods outside the diet plan)</p>

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
				<p>Trends towards increased tiredness (p = 0.09)</p> <p>Trends towards food cravings (p = 0.09)</p> <p>Trends towards increased trouble sleeping (p = 0.09)</p> <p>69 % reported increased cost of groceries</p>
Jones	Quantitative; Level II	Men & women between 18-55 years old with at least 3 of the symptoms of metabolic syndrome	Increased satiety & slower increase in hunger over a 90-minute period	None identified
Masharani et al.	Quantitative; Level II	25 patients with Type 2 Diabetes age 50-69	<p>Can increase ratio of urinary potassium to sodium (K/Na) excretion</p> <p>Can reduce urinary calcium/creatinine ratio by -45 ± 43 (mg/g)</p> <p>Can increase urine pH by $+0.8 \pm 0.5$</p>	<p>Can reduce HDLs (-8 ± 7 mg/dL)</p> <p>Can increase ratio of urinary potassium to sodium (K/Na) excretion (increased by 2.0 ± 0.8)</p> <p>Can reduce urinary calcium/creatinine ratio by -45 ± 43 (mg/g)</p>

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
			<p>Can reduce HbA1c by 0.3% over 3 weeks</p> <p>Fructosamine levels declined by 34 $\mu\text{mol/l}$</p> <p>Can reduce LDLs (-15\pm 22 mg/dL)</p>	<p>Can increase urine pH by +0.8 \pm 0.5</p>
Mellberg et al.	Quantitative; Level II	70 post-menopausal, non-smoking women, with a BMI \geq 27 kg/m ²	Decreased total fat mass (-6.5 kg at 6 months)	<p>Difficult to maintain</p> <p>No significant differences in anthropometric measurements at 24 months; -4.6 kg at 24 months</p>
Osterdahl et al.	Quantitative; Level II	20 healthy volunteers aged 20-40 (10 men, 10 women)	<p>May cause weight loss (mean weight -2.3 kg in 3 weeks)</p> <p>May lower blood pressure (systolic blood pressure decreased by -3 mm Hg)</p> <p>May cause increased satiety (intake of energy decreased by 36%)</p>	<p>Calcium intake decreased to 50% of the recommended dietary allowance</p>

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Patel & Suleria	Systematic Review; Level IV	N/A	May help reduce inflammation	None identified
Pitt	Systematic Review; Level IV	N/A	None identified	10% more expensive than an essential diet of similar nutritional value

Evidence-based literature on the vegan diet was comprised of ten scholarly articles and appraised to conclude that there was a total of fourteen advantages and five disadvantages. The overlapping benefits between the studies include lower body weight and decreased risks for hypertension, cancer, a cardiovascular event, and type 2 diabetes. The disadvantages included lower calcium intake, increased risk for bone fractures, and inadequate vitamin D and B12 intake.

Table 3

Vegan Diet Advantages and Disadvantages

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Beezhold, et al	Level II	283 adult vegetarians 109 adult vegetarians 228 adult omnivores	Anxiety & stress scores lower for vegans compared to omnivores	None identified

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Craig et al.	Level IV	106 Studies	Vegans were thinner, had lower serum cholesterol & blood pressure, and had a lower risk of CVD Plasma 32% lower & LDL cholesterol 44% lower among vegans compared to omnivores	Risk of bone fracture & BMD when there is an inadequate intake of calcium & vit. D
Grebowiec et al.	Level II	20 Omnivore healthy adults (14 females, 6 males)	None identified	A significant decrease ($p < 0.0002$) of serum B-12 concentrations in vegan subgroup consuming exclusively natural products ($p < 0.0001$). None of the subjects consuming B12 fortified food demonstrated the decline of B12 concentration
Ho-Pham et al.	Quantitative; Level I	181 post-menopausal, Asian nuns	Lower body weight Decreased risk of bone fracture due to an elimination of animal products and lipids	73% decrease in bone density compared to 46% in omnivores

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
Le & Sabate	Systematic review; Level IV	6 (studies) on American Adventists	Vegans -75% lower risk of hypertension & 14% lower risk of all cancer compared to non-vegetarians Vegetarians- 55% lower risk of hypertension & 8% lower risk of cancer than non-vegetarians	Vegans- 73% higher risk for urinary tract infection than non-vegetarians
Lusk et al.	Level IV	42 articles utilized	Cheaper to produce crops versus livestock at the farm level	Strictly vegan or vegetarian diets required more land to produce food than a calorie-neutral diet that involved the consumption of some meat
McDougall et al.	Quantitative study; Level I	1,615 subjects of different ethnicities, ages, & genders, most of which had a cardiovascular or metabolic disease	In 7 days: Weight loss average of 1.2 kg 22 pts decrease in cholesterol Decrease in blood pressure. Systolic decrease by 8 mmHg Diastolic decrease by 4 mmHg Blood glucose decreases by 3	None identified

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
			Decreased risk of cardiovascular event from 7.5% or to 5.5%	
Turner-McGrievy et al.	Quantitative study; Level II	18 women with PCOS, overweight, problems with infertility	Compared to low calorie diet, clients on the vegan diet lost significantly more weight in the first 3 months	By six months, difference in amount of weight loss between clients on both diets was insignificant
Turner-McGrievy, G.M., et al.	Level II	50 overweight adults, non-white, 27% men	Plant-based led to greatest weight loss at 6 mo. mark compared to three other dietary patterns	None identified
			Favorable changes in macronutrients, fiber, & cholesterol among vegan group	
Tuso et al.	Systematic Review; Level IV	10+ studies	More calories burned after meals compared to non-vegetarians	None identified
			Can decrease use of medications for chronic conditions, like cancer & ischemic heart disease	

Author	Type of Study/ Level of Evidence	Sample Size	Advantages	Disadvantages
			Men had a 7.6 kg weight reduction & women had a 3.3 kg weight reduction. Mean of 2-4-point reduction in BMI of participants.	

Three common diets show a total of thirty-eight benefits and twenty-two limitations, categories of these findings included those related to cardiovascular systems, blood glucose, elimination, musculoskeletal system, psychosocial, environmental and economical. These are presented below.

Cardiovascular Effects

In researching the three diets and their effects on cholesterol levels, it was found that the ketogenic, paleolithic, and vegan diets, all may reduce LDL levels. Research showed paleo may reduce LDL levels by 15 ± 22 mg/dL; however, it was found that the ketogenic diet may increase HDL levels by 1.71 mmol/L. In another study, it was found the ketogenic diet may increase HDL by 0.23 ± 0.09 mmol/L. The paleo diet also noted significant decreases in triglyceride levels by 0.89 mmol/L as well as the ketogenic diet which stated decreases in triglycerides between 1.59 ± 0.55 to 0.91 ± 0.33 mmol/L after interventions were used.

A common benefit that the ketogenic, paleo, and vegan diets were all found to have is a substantial positive effect on blood pressure. The paleo diet showed lower blood

pressure by 9.1 mmHg systolic and 5.2 mmHg diastolic, and the ketogenic diet decreased the diastolic blood pressure by a mean of 34.99 mmHg. When comparing a low carb diet to a low-fat diet, the diastolic blood pressure mean difference was found to be 1.43 mmHg, favoring a low carb diet. In the research it was found that the vegan diet decreases the systolic blood pressure by 8 mmHg and the diastolic blood pressure by 4 mmHg.

In addition to positive effects on blood pressure, all three diets have been beneficial to promoting weight loss. The ketogenic diet increases fat metabolism during exercise which as a result promotes weight loss from reducing body mass and fat content. A 58% weight reduction in the participants with type II diabetes was seen when combined with moderate physical activity, overall a 5-7% decrease of initial body weight was measured. The trials measuring the paleo diet measured a 2.3 kg decrease within three weeks, and the vegan diet was found to decrease its participants' BMI by two to four points. The men that participated in the vegan study experienced a 7.6 kg weight reduction, while the women had a 3.3 kg weight reduction.

There were few limitations found from the three diets regarding cardiovascular health. It was found that the paleo diet may decrease HDL levels by 8 ± 7 mg/dL, while the ketogenic diet may increase LDL levels by 0.6 ± 0.2 mmol/. The ketogenic diet also has the potential risk of stiffening of arteries.

Effects on Blood Glucose

Type II diabetics were greatly impacted by the ketogenic, paleolithic, and vegan diets because of their benefits and limitations in regard to blood sugar. It was found that

the paleo diet may reduce HbA1c by 0.3% in three weeks. The fructosamine test measures the fructosamine level in the blood to measure the effectiveness of diabetes treatment, and the paleo diet was found to decrease the fructosamine level by 34 $\mu\text{mol/L}$. The ketogenic diet improved the blood glucose by 1.5 in 24 weeks and the vegan may improve blood glucose levels by 3 points. Decreasing glucose levels has multiple benefits on the body, but it also has the ability to decrease the risk for cardiovascular disease.

Effects on Elimination

Urinary elimination was found to be the most impacted by the paleo diet. It was found to increase urinary potassium to sodium ratio by 2.0 ± 0.8 , however it may reduce urinary calcium to creatinine ratio by 45 ± 43 mg/g. The findings also show that the paleo diet may increase urine pH by $+0.8 \pm 0.5$. For those with electrolyte imbalances, the paleo diet may increase urinary potassium to sodium ratio by 2.0 ± 0.8 and may reduce urinary calcium to creatinine ratio by 45 ± 43 mg/g. In addition, it may increase urine pH by $+0.8 \pm 0.5$.

In the vegan diet there is evidence leading to higher risks of urinary tract infections based on the studies reviewed. While a complication with urinary elimination related to the ketogenic diet is that it may cause renal stones due to hypercalciuria. However, in regard to bowel elimination, the paleo diet saw there is a risk for episodes of diarrhea, which was found in 23% of 39 women participants.

Musculoskeletal Effects

Musculoskeletal effects were observed on individuals on the three diets. Findings showed that the paleo diet may reduce inflammation in the body and may be inversely

associated with risk of colorectal adenoma due to patterns high in fruits and vegetables. These patterns may help improve oxidative balance, increase dietary fiber intake, and reduce total energy intake. Meanwhile, research found that the ketogenic diet may decrease post exercise muscle damage and while increasing exercise endurance in athletes. However, the paleo diet can lead to a decreased calcium intake of up to 50% of recommended dietary allowance, potentially affecting the muscles and bones of individuals abiding by this diet. Other insufficient nutritional intake was found in the vegan diet regarding vitamins and minerals, particularly calcium, vitamins B6, B12, and iron.

Psychosocial Effects

Changing the way individuals eat can have a significant impact on their attitude and mental status. The paleo and the ketogenic diets have both been found to increase satiety, and the paleo diet specifically showed that energy intake or caloric intake decreased by 36%. Psychologically, the ketogenic diet has been shown to improve mood, meaning anxiety and stress levels are lower after a period of time on this diet. The ketogenic diet was shown to improve sleep patterns by increasing the time in deep sleep stage 4, however, negative sleep effects were observed from the diet due to reduce time in the REM stage. Those observed consuming a vegan diet ranked lowest in anxiety and stress scores compared to individuals who incorporate meat in their diets. However, the opposing effects of the Paleolithic diet showed trends towards increased tiredness ($p = 0.09$), towards food cravings ($p = 0.09$), and towards increased trouble sleeping ($p = 0.09$). The paleo also may increase cravings that are difficult to maintain; there was only -

4.6 kg weight reduction at 24 months. Although the ketogenic and paleo diets have shown they increase satiety, the vegan diet has been shown to decrease satiety, which is a limitation that causes many individuals to default from this lifestyle back to their prior consumption habits.

Economic and Environmental Effects

When analyzing the socioeconomic impact of the vegan diet, it was found that it is cheaper to produce crops versus livestock at the farm level, but more land is required to produce food than a calorie neutral diet that involves the consumption of some meat. There may also be decreased health care costs and prescription medical usage with the vegan diet if used correctly because they would be at a lower risk for developing disease. It was shown that there is a 14% lower risk from all types for cancer for those who consume a vegan diet in comparison to non-vegans. In comparison to the paleo diet, which can be more expensive due to an evidenced 10% cost increase. Not only the cost amount, but the time to prepare meals for the paleo diet is a limitation that is taken into consideration by individuals before starting this lifestyle.

Discussion

Data resulted in a variety of significant health benefits and limitations. The following will include comparisons and interpretations of these findings.

Ketogenic Discussion

In the beginning, the ketogenic diet was originally intended to control seizures, but it was also found to have additional health benefits such as weight loss, decrease blood pressure and cholesterol, and decrease anxiety (Moore & Westman, 2014). Upon

completing research on the ketogenic diet, however, multiple health limitations were found that oppose the proposed benefits.

The number one limitation of the ketogenic diet is that there is limited research on the long-term effects of the Ketogenic diet, and it needs to be further explored before clients choose to permanently switch to this diet as their chosen way of living. There has been clinical evidence of a Biotin deficiency in experimental mice, where the mice consuming a ketogenic diet demonstrated hair loss and dermatitis after 9 weeks. This research suggests that individuals who consume the ketogenic diet will similarly have an increased requirement for biotin and therefore will require additional supplementation if biotin levels are proven to be insufficient (Paoli, 2014). As previously stated in the findings, a disadvantage of the ketogenic diet is the stiffening of arteries (Bradley, 2009). Based on this information, this would put long term consumers of the ketogenic diet at a higher risk for arteriosclerosis, which contradicts findings of lowering the risk for cardiovascular disease (Bradley, 2009).

At the start of any new diet, it takes the body time to adapt to any restrictions of previous foods or additions to new foods. It was found that in the first 8 weeks participants experienced mood improvement. But, after the 8 weeks, the mood improvement was shown to plateau due to lower concentration of serotonin in the brain from limited consumption of carbohydrates over a period of 12 months (Brinkworth, 2009).

According to the study findings, drop in diastolic blood pressure with a mean of 34.99 mmHg was the most significant difference found when comparing the low-fat and

low-carbohydrate diets (Bueno, 2013). Also, according to another study, weight loss averaged to be 5-7% of the participants' initial body weight (Bradley, 2009). These findings point back to the mechanism of the diet which is the process of ketosis. Randall and Groveman explained the process to mimic the effects of fasting which causes weight loss (Randall & Groveman, 2016). However, the findings overall showed that there was not a significant difference in health benefits when comparing the low-fat and low-carbohydrate diets (Bueno, 2013).

Paleolithic Discussion

Studies included in this research analysis indicated that the paleo diet has positive effects on weight loss, blood pressure, blood glucose, cholesterol, inflammation, and satiety. However, the studies indicated that weight loss may occur at a slower rate when compared to the vegan or keto diets with a latter plateau in amount of weight loss or even a latter slight weight gain (Mellberg et al., 2014).

Many foods in the modern diet are considered acidogenic, meaning they lower the body's pH. The majority of the foods on the paleo diet, such as fruits and vegetables, however, are considered alkaline, which means that they may help neutralize extracellular fluid pH, which is necessary for homeostasis and could prevent or treat inflammation (Patel & Suleria, 2017).

It is important to analyze the diet for its long-term implications. First, the origin of the diet's name has already been discussed in earlier sections, but the researcher must question the significance of the Paleolithic time period. This diet encourages populations to eat as the "cavemen" did, but for what reasons? The supporters of this diet may assume

that members of the Paleolithic period maintained better health, but we don't know this to be true. They hypothesize that if today's society went back to a "hunt and gather" mentality, then overall health would improve (Voegtlin, 1975, p. 7). However, if man's body has evolved and adapted over hundreds of years to new foods and environmental exposures, what may have worked for the original people during this era may not prove to have the same benefits for an individual's body today.

Another argument that can be made against the paleo diet is the encouragement of a plant-based diet. Several benefits of the paleo diet relate to the fact that the client consumes only fruits, vegetables, and limited grains in addition to meat. This raises question to what benefits the paleo diet may have over the vegan diet, which is completely plant-based. Research in early sections explains that meat consumption, specifically red meat can increase a client's risk for heart disease (Pacheco et al., 2018) as well as possible bone loss (Delimaris, 2013).

The paleo diet enforces the importance of quality foods from natural sources. The Paleolithic period allowed the population at that time to only consume the meat of animals that grazed on plants, rather than the antibiotic fed animals provided today, which can result in antibiotic resistance in humans today ("National Antimicrobial Resistance", 2018). Because clients on this diet can only consume meat from grass-fed animals, this can affect the affordability of the client as well. Moreover, clients must be cautious in keeping their protein intake between 19 and 35% (Cordain, 2011). Extra protein is not used efficiently by the body and may impose a metabolic burden on the bones, kidneys, and liver (Delimaris, 2013).

Calcium is known to be important for optimal bone health (“Calcium and Calcium Supplements”, 2018). However, the paleo diet can lead to decreased calcium intake of up to 50% of recommended dietary allowance. People on this diet may have low bone mass density, which could lead to osteoporosis (“Calcium and Calcium Supplements”, 2018).

Furthermore, this diet is not the most convenient, because increased time may be required for meal preparation. The paleo diet is considered a low carb diet and as a result, consumers have complained of tiredness (Genoni, Lo, Lyons-Wall, & Devine, 2016). The diet offers very few sources for carbohydrates which are a vital source of energy for the body (“Paleo Diet”, 2017). Therefore, the paleo diet may yield positive results for certain populations with specific health needs, but it is important for consumers to be aware of certain drawbacks to the diet as well.

Vegan Discussion

Although the vegan diet has historically been used for religious purposes and in support of the environment, the diet promotes weight loss and several other health benefits. The vegan diet has been proven to be beneficial in reducing the chances of getting chronic disease like cancer, hypertension and diabetes mellitus, but there are still drawbacks which inhibit people from fully committing to the lifestyle (Le & Sabate, 2014).

People looking to lose weight often want the quickest results with the least amount of work, but being vegan requires a full lifestyle change that will require additional dietary supplementation and inhibit the consumption of many popular processed foods and fast foods and may interfere with cultural and social activities that

involve food. Although it is becoming increasingly popular for restaurants in larger cities to include vegetarian and vegan options, restaurants in rural or small towns may lack options for these specific diets at this time. This makes it difficult to go out and eat with friends or. Fast food is a quick and inexpensive meal option if time and money are limited, but many popular fast food spots have yet to offer vegan options. For example, McDonald's fries are not considered vegan because they are seasoned with beef tallow according to their official website ("The Crisp, Craveable, Fan Favorite", 2018). Every single food choice must be evaluated because of the stringent requirements on this diet. This might not be the best option if time commitment is a struggle because of the extra time plus effort that it will take when planning and preparing meals.

Nutritional supplementation is required to maintain adequate nutrition and subsequent bone density and proper blood production. The vegan diet does have limitations including nutritional deficiencies. Most commonly deficiencies of calcium, iron, vitamin D, and vitamin B12 are present as they are primarily found in meat (Tuso et al., 2013). However, the studies have not found correlations between the vegan diet and protein deficiencies, decreased protein intake is a concern among individuals questioning the diet because of satiety and muscle building (Ho-Pham, Vu, Nguyen, & Nguyen, 2011).. Soy products like tofu, tempeh, and edamame have high amounts of proteins and are often used as meat substitutes in dishes, but studies have shown a positive correlation between increased risks of breast cancer and soy consumption due to increase in body estrogen. Although these are just three of the high vegan protein sources, the limited vegan sources may be discouraging for someone trying to take on this lifestyle.

A single study indicated an increased risk for urinary tract infections among vegan subjects which may be due to the decreased calcium intake and subsequent alkalization of urine (Le & Sabate, 2014). The risk for decreased nutrient intake is a common worry among adults, but especially in children. Kids need adequate nutrients for growth and vegan parents must decide whether they will feed their kids the same diet that they follow. Although they are picky-eaters, kids do not have as much say on what goes into their bodies because they are required to eat what is made available to them. Maintaining a vegan diet in children may also be increasingly difficult if the child is in school and social settings where they are around other kids who do not follow unique diet plans, which may cause them to feel left out.

This literature synthesis demonstrates that the three common diets all accomplish weight loss, and there are additional physical and mental benefits. Weight loss can help decrease risk for metabolic diseases such as insulin resistance, type 2 diabetes, dyslipidemia, and fatty liver disease (Jung & Choi, 2014). These diets can also help with decreasing risk of problems with immobility, skin breakdown, respiratory challenges, moisture retention, friction, and decreased tissue perfusion (Lowe, 2009). It was also found, there are specific benefits and limitations to each diet. When searching for a new diet or lifestyle change to try, one must look at the individual's physical and mental characteristics and any personal preferences they may have in terms of choosing a diet.

Implications

Three common diets were evaluated for health benefits and limitations. Implications for these results are discussed for each individual diet.

Research

More research must be conducted to explore and compare the long-term effects of these methods of weight-loss. There are a multitude of short-term studies on the limitations and benefits of the ketogenic, paleolithic, and vegan diets, however, the long term maintenance of these diets have not yet been studied. More longitudinal studies on these diets would be very beneficial to see long term effects (ie. greater than 3 years), these diets have on individuals. Live studies with observed and monitored subjects should also be included in new research on the keto, paleo, and vegan diets.

Studies over more diverse populations would also be recommended because most of the populations in the studies found in this research were groups of Caucasian males, postmenopausal women, or those with chronic preexisting conditions. In addition, it would be especially helpful to have socioeconomic studies on these diets to have more knowledge of their effects on various communities depending on their socioeconomic status. There is also a significant need for studies on children due to the fact that many are unaware of how these diets may affect their growth and development. Overall, research over these diets can be continued for many years to come and there are many issues still needing to be further explored.

Education

The comparative analysis of the studied diets must be synthesized into relevant information to share with healthcare workers as well as the public. Knowledge on the topic provides health care professionals with the materials to better empower clients and provide effective treatment involving reducing health care costs, improving the economy,

and benefitting overall health and wellness for a population. Educating communities on the mechanisms of certain diets and the significant effects of unhealthy eating on the body, allows clients to stay knowledgeable to restore health, to effectively treat health problems, or to prevent them from occurring in the first place.

Clients should be educated about nutrient-rich vegan foods, namely plant-based protein, calcium, and iron. Non-meat protein sources include, chickpeas, tofu, and black beans. Foods like spinach, cashews, cabbage, and tomatoes, are rich in iron. Calcium-rich foods include, bok choy and kale, and soymilk is a good source of vitamin D. Once-again, supplement usage is recommended to reach the daily recommended values of these nutrients, especially for females, who tend to be iron, calcium, and vitamin D deficient (Tuso, 2013). Clients at risk for impaired urinary tract health should also take caution with this diet (Le & Sabate, 2014).

Healthcare workers need to be educated on the limitations of the paleo diet due to the low carbohydrate intake. They may need to be trained to monitor blood sugar levels. They should also be aware that this diet is beneficial to those who have type II diabetes, individuals with a high BMI, at risk or have metabolic syndrome, as well as those who may suffer from digestive tract issues like constipation. Health care workers also need to educate those following the ketogenic diet to monitor their LDL and HDL levels. This diet however, may not be beneficial to those who are at risk for kidney stones, renal problems, who have a fat metabolism disorder, or do not have a gallbladder to break down excessive fats, as well as those who have a bile production deficit.

Practice

The information gathered through this research allows nurses and physicians to practice evidence based care for patients and families regarding appropriate diet choices to make for their particular health needs. This study provides information to health care providers to collaborate with dietitians and hospital food services to provide premium plans and options for patients to select from during their hospital stay. Implementing evidence-based-research interventions into patient care could positively affect patient outcomes and address health disparities in multiple populations.

Healthcare providers must collaborate with dietitians to tailor diet plans for the specific disease processes of each client and to educate the population on the truth behind each diet. For example, the vegan diet tends to yield excellent results for those at risk for or diagnosed with obesity, type II diabetes, and cardiovascular disease. In addition, the plant-based diet does not tend to leave its consumers protein deficient; the average person only needs to consume 0.8 grams of protein per kilogram of body weight a day, (Pendick, 2015). However, with limited meat consumption and a plant-based diet, clients may be at risk for calcium and vitamin D, iron, and B12 deficiencies, and should consider supplement usage.

Dietitians should be included in patient care at the bedside. This could be encouraged by providing consults and referrals to those admitted with a BMI of 30 or higher. If a patient is found to have a BMI at or above thirty, which is considered obese, then he should be referred to a dietitian, who can design a diet plan based off the individual patient and his desired health outcomes (“Healthy Weight”, 2017). As part of

follow up care, required interventions for these patients could include a mandatory food diary and an educational course on weight management.

For prevention, government intervention in school districts and hospitals would be ideal to mandate compliance for healthy diets and lifestyles. The nursing role should be an advocate for their patients, especially if the patient is obese, to achieve wellness and weight loss. Standardized packets of information tailored towards the number one issue the patient has regarding wellness can be sent home with discharge papers to educate the client on the next step.

Strengths and Limitations

The strengths of this study included the use of a research mentor who is experienced in nursing research and wellness. Another strength was the high level of interest of the authors in the topic selection, the ready availability of current research in the literature on the topic and having full length two semesters to complete the project. However, there were limitations of this study which included the inexperience of student nursing researchers, other obligations and classes occurring at the same time as the research, inability to use all databases due to fees associated with some journals, and the time constraint of meeting with the mentors. Another limitation for this study was that a lot of the available research was older than 10 years.

The limitation of databases used could have introduced a sample bias, as well as the opinions and backgrounds of the student researchers. Prior to conducting research on the three diets, each student researcher had their own preconceived notions, and had

“favorite” aspects of each diet. This could have created a bias when researching the benefits and limitations of the paleo, ketogenic, and vegan diets.

Recommendations

Recommendations for replication of this study include the use of more and greater variety of research as well as use of a larger sample. It would also be helpful if researchers had more dedicated time for the research project and better time management without extended breaks during the research process.

Conclusion

Many of America’s healthcare costs are attributed to the obesity epidemic. Obesity is now considered a chronic disease that can have serious negative impacts on overall physical and mental health. A comparative analysis of the popular diet plans provides relevant information for nurses to educate and treat their patients to achieve healthy weight loss and provide effective health maintenance. This research, though limited in scope of populations explored may be applied to a variety of individuals. This research found 38 benefits and 20 limitations categorized by weight loss as well as cardiovascular, blood glucose, elimination, musculoskeletal, psychosocial, economic, and environmental effects. Commonalities included weight loss while major differences included time frame of weight loss, blood pressure changes, elimination patterns, musculoskeletal effects, psychosocial responses, and environmental and economic impact. The paleolithic, ketogenic, and vegan diets were all analyzed in this study and yielded significant weight loss results. Recommendations by health care providers should

include considerations of current patient health status and how a specific diet may benefit or hinder patient outcomes.

Nurses should advocate for patient care by promoting nutritional changes in collaboration with dietitians and health care providers in developing dietary interventions for effective management of obesity and its associated complications. In doing this, nurses will promote a longer and healthier life for individuals, and as a result a healthier America.

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