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Bringing Truth to the Table: An Evidence Review to Dispell Common Dietary Myths

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BRINGING TRUTH TO THE TABLE: AN EVIDENCE REVIEW TO DISPEL
COMMON DIETARY MYTHS

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of the Requirements for
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DISPELLING COMMON DIETARY MYTHS

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DISPELLING COMMON DIETARY MYTHS

Summary

Nurses are most directly involved with patient care and are in an excellent position to be patient educators. Patients are more likely to actively listen after establishing rapport, especially for loaded topics such as lifestyle choices. While nurses have general nutrition knowledge, they may lack current, scientifically-based information to help patients implement a healthy diet. Nurses can both educate and be an example of health habits that patients should emulate, and therefore need to be adequately informed about topics like dietary misconceptions.

The purpose of this project was to examine and disseminate current evidence-based information about common dietary misconceptions to nurses. By providing accurate information and targeted patient education strategies, this project assisted nurses in providing appropriate and effective diet and hydration information to their patients.

An evidence review using CINAHL was performed to find accurate scientifically-based information about dietary misconceptions with a focus on sugar, dairy, hydration, and healthy eating patterns. The review found advances in research around each of these misconception

The review found research has been conducted in all four focus areas. The addictive properties of sugar appear complex and the quantity of sugar has a greater effect than the form. Regarding dairy, calcium intake and weight loss have a positive correlation and yogurt with probiotics benefits digestive regulation. Varying recommendations for daily hydration were found but with minimal scientific basis. There is inconclusive evidence about the benefits of one eating pattern, such as skipping breakfast, over another.

Accurate, up-to-date information regarding dietary misconceptions is available. Nurses have a professional obligation to remain current and translate this information to patients to

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promote healthy decision making. Individual needs and preferences should also be considered by the nurse to empower the patient's healthiest life.

DISPELLING COMMON DIETARY MYTHS

Section I

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Bringing Truth to Table: An Evidence Review to Dispel Common Dietary Myths

DISPELLING COMMON DIETARY MYTHS

Bringing Truth to the Table: An Evidence Review to Dispel Common Dietary Myths

Making decisions about living a healthy lifestyle is challenging for many reasons. One challenge for patients making lifestyle choices is the varying quality of available information about food choices and eating habits. The cost of food, location of grocery stores or lack thereof, and available time and access to thoroughly research healthy habits are other factors contributing to the difficulty of implementing healthy lifestyle changes. Having accessible, accurate information and advice about food groups can help bridge the gap between intake and recommendations (Ruxton & Derbyshire, 2014). While nurses at all levels of practice receive general nutrition knowledge in their training, they may lack scientifically-based information on current trends or recommendations to help patients implement a healthy diet.

Health care professionals, including nurses, have an obligation to remain current on trending health behaviors and translate accurate, up-to-date information to their patients to promote healthy decision-making (Sobel & Dalby, 2014). Nurses are directly involved with patient care and are in an excellent position to educate patients (Malik, Blake, & Batt, 2011). Because of the rapport often established with the nurse, patients are more likely to actively listen, especially related to personal topics such as lifestyle choices (Malik et al, 2011). Although nurses play a key role in health promotion, many do not apply current information on best lifestyle practices in their own lives (Malik et al., 2011). An important step in nurses both implementing worthwhile personal habits and providing the most accurate lifestyle teaching for patients is clarifying areas of health information that are commonly misunderstood. Nurses at all levels of practice can then both educate and be an example of health habits for patients to emulate. (Malik et al, 2011).

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Four dietary areas in which patients commonly need further education are sugar, dairy, hydration, and eating patterns and their effect within a healthy diet. A literature review was conducted to gather relevant evidence about six popular dietary “misconceptions”: 1) natural (or “table”) sugar is better for the body than processed sugar, 2) sugar is addictive, 3) milk helps with weight loss, 4) yogurt helps regulate the digestive tract, 5) 8 glasses of water a day is recommended, and 6) breakfast is the most important meal of the day. The review focused on identifying current information about these popular dietary misconceptions to improve nursing knowledge. To improve nurses’ dietary knowledge base and provide accessible and reliable information to healthcare providers, evidence-based information on dietary misconceptions will be presented in a clinical journal article targeting nurse practitioners as facilitators of health promotion with patients.

Review of the Literature

Is Natural Sugar Healthier Than Processed Sugar?

High fructose corn syrup (HFCS) being “worse than sugar” has been cited as a significant nutrition myth in lay literature (Hull, 2019). Among the sugar-based products available, each is either in a natural or synthetic form. All sugar products can be broken down to one of three disaccharides (two conjoined carbohydrate molecules); sucrose, maltose, and lactose (Sobel & Dalby, 2014). Table sugar, or sucrose, is the most easily identifiable natural sugar, and can be found in and extracted from beet juice, sugar cane, fruits, honey, agave nectar, and maple syrup (Sobel & Dalby, 2014). Introduced in the American diet in the 1970s as a popular industrial sugar substitute, HFCS, a form of processed sugar, has recently been targeted as the underlying cause of a variety of health problems (Sobel & Dalby, 2014). Nurses and other clinicians often provide dietary information regarding fats, fiber, caloric consumption, and salt to their patients,

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but exclude HFCS, due to limited current literature comparing HFCS and table sugar to help guide clinicians with patient teaching (Sobel & Dalby, 2014). Researchers are finding HFCS metabolizes differently than table sugar, affecting triglyceride and lipid levels (Sobel & Dalby, 2014). Some evidence suggests fructose, the primary ingredient in sucrose and HFCS, has an overall negative effect on health outcomes (Sobel & Dalby, 2014). Most literature does not delineate between HFCS and table sugar when discussing their health effects, which may contribute to the lack of perception of synthetic sugars as a public health concern (Sobel & Dalby, 2014).

There are well-established links between high dietary sucrose intake and rates of obesity, dental caries, and development of chronic diseases such as Type II diabetes mellitus (Morenga, Howatson, Jones, & Mann, 2014). As health morbidities continue to be a nationwide focus, controversies such as natural versus processed sugar are being researched more closely, looking specifically at the composition of sugar and its role as a food additive and sweetener (Sobel & Dalby, 2014). Currently there is conflicting research on the effects of processed sugar compared to natural sugars on the body. Health professionals need clear and accurate information on how HFCS affects the body compared to table sugar to properly educate patients.

Is Sugar Addictive?

Popular media has recognized “sugar is as addictive as heroin” as a “health fact you’ve been told all your life that are totally wrong” (Mosher, 2016). The concept of “food addiction” has regained popularity in recent years as a causative factor to the ongoing and ever-increasing worldwide obesity epidemic (Markus, Rogers, Brouns, & Schepers, 2016). Contributors to obesity include growing access to inexpensive, calorically dense, sweet or fatty food (Markus, et al, 2016). Sugar and sugar-sweetened beverages have also been linked to and may even predict

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weight gain to the point of obesity (Bray, 2016). Some believe “sugar addiction” is an easy explanation, and possible excuse, for over-consumption of sugary foods (Markus et al., 2016). Sugar is thought to have a similar function to many illicit drugs and alcohol, activating the “pleasure center” in the brain, which further promotes the belief sugar is an addictive substance (Bray, 2016). Withdrawal from a high-sugar diet is associated with similar withdrawal symptoms seen in other addictions, such as illicit drugs and alcohol (Bray, 2016).

Although research is limited in providing adequate understanding of the addictive nature of sugar on the human body, there are methods for testing the addictive properties of food (Markus, et al., 2016). The Diagnostic and Statistical Manual for Mental Disorders (DSM-V) criteria for substance use disorders has been utilized to compare the potential harm of food-related issues (Markus, et al., 2016). These criteria include tolerance, withdrawal, considerable time spent on finding, using and recovering from the abuse, inability to cut down despite the desire to do so, and continued use despite negative consequences (Markus, et al., 2016). An infrequently used, but validated method for measuring the addictive property of food is the Yale Food Addiction Scale (YFAS) which was developed to quantify symptoms of “addiction-like eating” (Markus, et al., 2016). These symptoms include food taken in larger amount and longer than intended, amount of time used to obtain and use the substance, and a persistent desire or repeated unsuccessful attempt to stop use (Markus, et al., 2016). Ultimately, the YFAS found that food addiction symptoms are more related to high-fat sweet and savory foods instead of sugar-sweetened foods (Markus, et al., 2016).

When educating patient on ways to attain a healthy lifestyle, clinicians should address the potential addictive properties of sugar; however, standardized teaching materials for clinicians regarding the potential addictive properties of sugar are limited. The World Health Organization

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(WHO) recommends close monitoring of sugar consumption, maintaining an overall daily intake of less than 40 grams (Sobel & Dalby, 2014). Nurses should use the current recommendations for sugar intake as a guide when discussing the risks associated with a high-sugar diet with patients.

Does Milk Intake Help With Weight Loss?

“Milk can help you lose weight” is a common dietary myth (Solo, 2018). Dairy products, such as milk, cheese, and yogurt are high in calcium and have a wide variety of demonstrated health benefits such as improved bone health and blood pressure maintenance (LiPuma, 2017). Calcium potentiates muscle contraction and relaxation, blood clotting, and acts as a neurotransmitter (LiPuma, 2017). Additionally, calcium is a necessary electrolyte for maintaining physiological needs. One standard serving of dairy (8 ounces of milk, 1.5 ounces of cheese, or 6 ounces of yogurt) contains roughly 30% of daily calcium needs (LiPuma, 2017). Adequate calcium intake for age and sex should be a key topic nurses stress when educating patients about daily dietary habits.

The current Dietary Guidelines for Americans, developed by the United States Department of Agriculture (USDA) and Health and Human Services (HHS), recommends three daily servings of dairy (LiPuma, 2017). Dairy products may reduce the risk of cardiometabolic diseases and some cancers (Thorning, Raben, Tholstrup, Soedamah-Muthu, Givens, & Astrup, 2016). However, there is public skepticism about dairy consumption and its association with the development of some chronic diseases, such as obesity and Type II diabetes. (Thorning, et al., 2016). Concerns about the relationship between dairy consumption and chronic disease has led to an increased intake of plant-based dairy alternatives, such as soy, rice, almond, and oat milk (Thorning, et al., 2016). Overall, research on the impact of adequate dairy intake on chronic

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disease development is lacking and needs to be addressed. Regardless, clinicians should continue to encourage patients to consume the daily recommended amounts of calcium, since calcium is an essential mineral for physiologic functioning.

Do Probiotics Benefit Gastric Regulation?

In a list of “health facts you’ve been told all your life that are totally wrong”, a popular myth noted was that “yogurt will help put your digestive system back in order” (Mosher, 2016). The human body naturally contains hundreds of species of bacteria that inhabit and regulate the digestive and urinary tracts (Harvard Women’s Health Watch, 2006). Health conditions can occur when the natural microflora of the gut is disturbed with the most common associated problems including acute diarrhea, lactose intolerance, and opportunistic bacterial infections such as *C. difficile* and *H. pylori* (Harvard Women’s Health Watch, 2005). Adolfsson, Meydani, and Russell (2014) found specific bacteria in the gut provide anti-pathogenic and anti-inflammatory properties. These bacteria, known as probiotics, are often used in the fermentation of dairy products such as yogurt (Adolfsson et al, 2004). Yogurt is fermented by a specific probiotic called lactic acid bacteria (LAB). For yogurt to meet the criteria of containing “live and active cultures”, it must have at least 10^8 LAB that remains active through the product’s shelf life (Adolfsson, et al., 2004). Studies on the therapeutic effects of LAB have thus far been inconclusive due to the differences in strains of LAB and routes of administration (Adolfsson et al, 2004). However, research on probiotics has shown probiotics aid in the treatment of gastrointestinal disease, delay pediatric allergy development, and facilitate the prevention and healing of female urinary and vaginal infections (Harvard Women’s Health Watch, 2005). Despite the inconsistent findings about their benefits, probiotics are generally considered safe and are often sold as dietary supplements (Harvard Women’s Health Watch, 2005). When

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considering important themes to include in patient teaching, nurses should demonstrate an understanding of the importance of maintaining a regulated digestive tract, the role that probiotics have in normal gut function including potential benefits and consequences, and source of additional probiotics that may be consumed by patients.

What is an Adequate Amount of Water Intake?

Another common dietary misconception is “everyone should drink eight glasses of water a day” (Mosher, 2016). Water comprises more than three-quarters of the human body and is vital for metabolism, cellular homeostasis, kidney function, temperature regulation, and circulatory function (Armstrong and Johnson, 2018). Necessary hydration is almost exclusively individually based, varying greatly based on age, weight, physical activity level, climate, and dietary intake (Armstrong and Johnson, 2018). The level of consumption of alcohol and caffeine, which both act as diuretics, also determines the daily amount of water an individual needs (Dow, 2018). One way to measure adequate hydration is utilizing the WUT criteria, which includes: *weight* (down more than 1% from an average morning weight), *urine color* (apple juice or darker), and *thirst* (to the point of having difficulty forming saliva) (Dow, 2018). Nurses often closely monitor urinary output during acute disease or illness management and are trained to identify the characteristics of an adequately and inadequately hydrated patient.

There are conflicting hydration guidelines shared in lay and clinical literature. The 8-by-8 rule, or the need to consume eight, 8-ounce glasses of water per day is a commonly shared misconception without a scientific basis (Dow, 2018). The National Academy of Medicine currently recommends around 12 cups of fluid per day for adult men and 9.5 cups for adult women, but this includes all fluid consumption (Dow, 2018). Total daily fluid intake is the full amount of water consumed from food, plain drinking water, and other beverages (CDC, 2016).

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Another approach to adequate hydration is to match milliliters of water with caloric intake; for example, eating 2,000 calories in a day should be paired with drinking 2,000 milliliters of water (Tufts University Health & Nutrition Letter, 2014). Fluid replacement in a hospital setting is based on weight in pediatrics and calculated individually in adults based on a variety of factors such as age, sex, and current hydration level (CDC, 2016). Due to the varying recommendations for appropriate water intake, nurses should be able to identify the characteristics of a well hydrated patient and navigate areas of concern regarding adequate hydration.

Is Breakfast the Most Important Meal of the Day?

Optimal meal frequency, timing, and size are important aspects of nutrition that lack scientific evidence (Kahleova, Lloren, Mashchak, Hill, & Fraser, 2017). “Eat more to boost your metabolism” and “you need to eat breakfast” are commonly accepted nutrition myths found in lay literature (Hull, 2019). Lack of knowledge about meal frequency, timing, and size may also play a role in the current obesity epidemic in the United States (Raynor, Goff, Poole, & Chen, 2015). One method for improving appetite control and weight management is to increase the number of daily meals consumed (Raynor, et al, 2015). Although research is limited on the direct effect of meal frequency on body weight, Kahleova, et al (2017) found meals eaten later in the day may adversely influence weight loss strategies.

In recent years there has been a steady decline in breakfast consumption, despite evidence demonstrating the health benefits, including a reduction in post-meal cravings and a decreased incidence of obesity (Baum, Gaines, Kubas, Mitchell, & Russell, 2017). Eating breakfast benefits overall nutrition status and dietary composition; however, whether the benefits stem from breakfast as a meal or the type of breakfast consumed is unclear (Gibson & Gunn, 2011). In the last fifty years, the composition of breakfast has changed from a primarily protein-based

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breakfast to now consisting primarily of carbohydrates (Baum et al, 2017). The majority of available research related to eating breakfast is focused on younger populations and the consumption of cereal specifically, due to its popularity as a breakfast food (Albertson, Thompson, & Franco, 2008). Cereal has been associated with better dietary quality in both adults and children and has demonstrated positive relationships with lowered body weight and negative cardiovascular risk factors (Gibson & Gunn, 2011). The cause of this is unclear, but the ingredients in cereal and the foods eaten concurrently with cereal are speculated as contributing factors to healthier weight and reduced risk for cardiovascular disease. (Albertson et al., 2018). More research is needed on optimal meal frequency and timing because of the inconsistencies in available data. Until more research is done, nurses and other clinicians can discuss individual nutrient needs with patients based on age, weight, and activity level and the healthiest ways to meet these needs.

Conclusion

Patients have become more responsible for their health status and are taking a proactive role in their health care due to increased access to health and medical information (Sesser, 2018). However, there is the question of whether patients that obtain dietary information will be able to understand and apply it to the management of their specific disease or condition (Sesser, 2018). Nurses have a professional obligation to remain current about topics such as dietary misconceptions and translate this information to patients in a way that they understand to promote healthy decision making. A review of evidence was conducted on four focus areas of misconceptions nurses commonly encounter when educating patients on dietary habits: sugar, dairy, hydration, and healthy eating patterns.

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The addictive properties of sugar appear complex, but findings suggest the quantity of sugar in a diet has greater effect than the form. Calcium intake and weight loss have a positive correlation and yogurt with added probiotics benefits digestive regulation. Varying recommendations for daily hydration were found but with minimal scientific basis. There is inconclusive evidence about the benefits of one eating pattern, such as increasing meal frequency, changing meal timing, or skipping breakfast, over another.

Clinical Implications

Despite varying conclusions within each dietary focus area, accurate, up-to-date information demystifying dietary misconceptions is available. Nurses should apply this up-to-date “debunked” information to patient teaching. One way to do this is utilizing the nursing process. The nursing process includes the steps of assessment, planning, implementation, education, and documentation (Sesser, 2018). There are many methodologies nurses can employ to educate patients, including lecture, demonstration, role play, discussion, and use of visual materials (Sesser, 2018). The nurse should choose a method which the patient can understand, relate, and retain presented information (Sesser, 2018). Patients who are adherent to recommendations and involved in the management of their disease typically have better health outcomes (Sesser, 2018). As the field of nursing continues to grow and improve, professionals at all levels of practice should remain informed about topics such as dietary misconceptions to empower the patient’s healthiest life. To promote accurate and timely dietary and hydration teaching, Chapter 2 of this thesis is presented as a clinical journal manuscript aimed at advanced practice nurses (APNs) to provide evidence-based information and patient teaching strategies. An evidence review poster was presented at the 2019 University of South Carolina College of Nursing Research and Scholarship Day (Appendix A).

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References

- Adolfsson O., Meydani S. N., & Russell R. M. (2004). Yogurt and gut function. *American Journal of Clinical Nutrition*, 80(2), 245–256.
- Alberston A. M., Thompson D., Franko D. L. et al (2008) “Consumption of breakfast cereal is associated with positive health outcomes: Evidence from the National Heart, Lung, and Blood Institute Growth and Health Study. *Nutrition Research*, 28, 744-752.
- Armstrong, L. E., & Johnson, E. C. (2018). Water intake, water balance, and the elusive daily water requirement. *Nutrients*, 10(12), 1928.
- Baum, J. I., Gaines, B. L., Kubas, G. C., Mitchell, C. F., & Russell, S. L. (2017). Educational nutrition messaging at breakfast reduces snack intake and influences snack preferences in adult men and women. *Appetite*, 117, 67–73
- Bray, G. A. (2016). Is Sugar Addictive? *Diabetes*, 65(7), 1797–1799.
- Dow, C. (2018). Bodies of water: How much--and which kind--of H²O do you need? *Nutrition Action Health Letter*, 45(7), 7–9.
- Gibson, S. A., & Gunn, P. (2011). What’s for breakfast? Nutritional implications of breakfast habits: Insights from the NDNS dietary records. *Nutrition Bulletin*, 36(1), 78–86.
- Health benefits of taking probiotics. (2005). *Harvard Women’s Health Watch*, 12(9), 6–7.
- How much water do you really need? (2014). *Tufts University Health & Nutrition Letter*, 32(5), 1–5.
- Hull, M. (2019). The Top 19 Nutrition Myths of 2019 (that just won't die!). Retrieved from <https://examine.com/nutrition/awful-nutrition-myths/>
- Kahleova, H., Lloren, J. I., Mashchak, A., Hill, M., & Fraser, G. E. (2017). Meal frequency and

DISPELLING COMMON DIETARY MYTHS

- timing are associated with changes in body mass index in Adventist Health Study 2. *Journal of Nutrition*, 147(9), 1722–1728.
- LiPuma, C. (2017). Celebrate dairy for health benefits. *Food Insight*, 1.
- Malik, S., Blake, H., & Batt, M. (2011). How healthy are our nurses? New and registered nurses compared. *British Journal of Nursing*, 20(8), 489–496.
- Markus, C. R., Rogers, P. J., Brouns, F., & Schepers, R. (2017). Eating dependence and weight gain: No human evidence for a “sugar-addiction” model of overweight. *Appetite*, 114, 64–72.
- Morenga, L. A., Howatson, A. J., Jones, R. M., & Mann, J. (2014). Dietary sugars and cardiometabolic risk: Systematic review and meta-analyses of randomized controlled trials of the effects on blood pressure and lipids. *American Journal of Clinical Nutrition*, 100(1), 65–79.
- Mosher, D. (2016). 49 health 'facts' you've been told all your life that are totally wrong. Retrieved from <https://www.businessinsider.com/worst-science-health-body-myths-2016-8>
- Raynor, H. A., Goff, M. R., Poole, S. A., & Chen, G. (2015). Eating frequency, food intake, and weight: A systematic review of human and animal experimental studies. *Frontiers in Nutrition*, 2(38).
- Ruxton, C., & Derbyshire, E. (2014). Strategies to encourage healthy eating among children and young adults. *Primary Health Care*, 24(5), 33–41
- Sesser, J. R. (2018). Patient education in the medical setting. *Journal of Continuing Education Topics & Issues*, 20(2), 52–57.
- Sobel, L. L., & Dalby, E. (2014). Sugar or high fructose corn syrup-What should nurses

DISPELLING COMMON DIETARY MYTHS

teach patients and families? *Worldviews on Evidence-Based Nursing*, 11(2), 126–132.

Solo, S. (2018). Busting 10 Diet Myths. Retrieved from

<https://www.realsimple.com/health/nutrition-diet/weight-loss/busting-10-diet-myths>

Thorning, T. K., Raben, A., Tholstrup, T., Astrup, A., Soedamah-Muthu, S. S., & Givens, I.

(2016). Milk and dairy products: good or bad for human health? An assessment of the totality of scientific evidence. *Food & Nutrition Research*, 60, 1–11.

Section II

Bringing Truth to the Table: Dispelling Common Dietary Misconceptions and Improving
Patient Education Strategies for Advanced Practice Nurses

DISPELLING COMMON DIETARY MYTHS

Bringing Truth to the Table: Dispelling Common Dietary Misconceptions and Improving Patient Education Strategies for Advanced Practice Nurses

Background

Chronic illnesses such as obesity are influenced by dietary habits and continue to rise despite public awareness of the issues and widespread efforts to change eating patterns. In 2010, more than 30% of the United States (U.S.) population was considered obese and the rate of people affected continues to rise (Markus, Rogers, Brouns, & Schepers, 2017). Obesity results in chronic low-grade inflammation, leading to a higher risk of developing Type II Diabetes Mellitus, cardiovascular diseases, and mood disorders such as Major Depressive Disorder (Markus, et al, 2017). Four areas of common dietary misconception are sugar, dairy, hydration, and eating patterns. Imbalances in any of these focus areas can result in a disturbance of the patient's homeostatic state, delayed healing, or contribute to lack of success in weight management.

Scope of the Problem

As health care providers, advanced practice nurses (APNs) play a role in the management of acute and chronic illnesses, including providing education to patients on methods of preventing chronic illnesses and maintaining an overall healthy lifestyle. While APNs receive general health and nutrition knowledge in their training, they often do not continue to seek updated evidence-based nutrition information, including regarding emerging dietary trends (Malik, Blake, & Batt, 2011). APNs need to be prepared to guide patients to accurate and useful healthy habits. APNs play an important role in remaining current about topics such as dietary misconceptions and translating accurate, scientifically-based information to their patient to promote healthy decision making (Sobel & Dalby, 2014).

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Purpose

An evidence-based review was performed focusing on common areas of misconception APNs may encounter when educating patients on dietary habits: sugar, dairy, hydration, and eating patterns. The review aimed to clarify dietary misconceptions and provide clearer understanding of the scientific evidence available on the four focus areas of sugar, dairy, hydration, and eating patterns.

Clinical Significance

Advanced practice nurses need accurate, up-to-date information to present quality and appropriate patient education. Educating patients in ways they can understand and retain requires utilizing applicable and effective teaching methods (Sesser, 2018). Involving patients in their individual treatment plans help patients to become more proactive in their health care often leading to more positive health outcomes (Sesser, 2018). As the field of nursing continues to progress, health care providers such as APNs can use current information on dietary misconceptions to empower the patient's healthiest life.

Sugar

Table sugar, or sucrose, is found in both synthetic and natural forms and can be extracted from sources such as beet juice, sugar cane, fruits, honey, agave nectar, and maple syrup (Sobel & Dalby, 2014). One of the components of sucrose is glucose, which provides energy for cellular function and is essential for central nervous system functioning (Henry, 2016). An acute excess of sugar in the body can result in a state of hyperglycemia, manifested through polydipsia, polyphagia, and polyuria (Henry, 2016). Prolonged or chronic hyperglycemia can lead to permanent neurovascular damage, hypertension, and kidney failure (Henry, 2016). Conversely, a deficiency of sugar leads to hypoglycemia, characterized by diaphoresis, palpitations, and mental

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confusion (Henry, 2016). Diseases and medications alike can cause an imbalance in blood glucose levels. Patients with these risk factors should be closely monitored by APNs and educated on proper dietary habits, as well as signs and symptoms of hyper- and hypoglycemia.

Calcium

Calcium is a mineral found naturally in the body and is found in many food products, including dairy. Calcium is essential for normal blood clotting, regulating blood pressure, and the formation of bones and teeth (LiPuma, 2017). High serum calcium levels can result in clinical concerns such as constipation, and renal calculi (Henry, 2016). Alternatively, hypocalcemia, or low serum calcium levels, is associated with muscular tetany, poor bone development and maintenance, and cardiac changes (Henry, 2016). Calcium excesses and deficiencies most often result from poor dietary intake or altered absorption in the gastrointestinal tract of the mineral (Henry, 2016). In patient encounters where an APN may be concerned about poor dietary intake or altered absorption, calcium levels should be monitored and managed to prevent major imbalances, which could lead to acute cardiac and respiratory changes. APNs have an opportunity to educate patients who require frequent monitoring and management of calcium levels to maintain homeostasis.

Probiotics

Probiotics are natural bacteria found in the gastrointestinal tract as well as an added ingredient in some foods, primarily yogurt. These microbes have been shown to aid in the treatment of acute gastrointestinal conditions such as diarrhea, delay pediatric allergy development, and facilitate the prevention and healing of female urinary and vaginal infections (Harvard Women's Health Letter, 2005). Probiotics are frequently administered concurrently with other pharmacological treatments such as antibiotics (Harvard Women's Health Letter,

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2005). Imbalances in the normal microflora of the gut usually occur because of medications or the introduction of foreign bacteria into the body through contaminated food or water.

Deficiencies of normal gut bacteria can cause a higher susceptibility to other bacterial infections (Kristensen, et al., 2016). An excess of bacteria manifests most often as abdominal discomfort or pain, nausea, vomiting, and diarrhea (Henry, 2016).

Water

Water is the most basic of nutrients and necessary for nearly all physiologic functions, including filtration and production of urine, preserving skin integrity, and regulating blood pressure (Henry, 2016). There are natural losses of water from the body due to respirations, sweat, and urination or defecation that must be replaced daily. Dehydration occurs from a deficiency of water with clinical manifestations including peripheral pulses, poor skin turgor, and dry mucous membranes (Henry, 2016). In contrast to dehydration, fluid volume overload is characterized by adventitious lung sounds, edema, and bounding peripheral pulses (Henry, 2016). Many medications and diseases can lead to significant fluid shifts related to alterations in urination or defecation, emesis, or respirations. A patient's hydration status should be closely assessed by a health care provider as part of standard assessments and following changes to treatment regimens or disease status to assess for early signs of imbalance.

General Nutrition

Calories are the units of energy the body gains from food or drink. The level of caloric intake a patient requires varies depending on age, sex, level of activity, and disease process (Henry, 2016). An excess of calories results in the body's inability to use the ingested energy and instead turns extra energy into fat, leading to weight gain. On the other hand, a caloric deficit means the body is not receiving enough energy to function. In response, stored fat and muscle

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are broken down to obtain needed energy, resulting in weight loss. Proper caloric intake is crucial during the healing process for a patient, as energy needs are often increased (Henry, 2016). Therefore, indicators of adequate nutrition, like weight and electrolyte levels, should be monitored closely during acute illnesses or recovery. APNs managing patients with nutritional concerns can calculate optimal meal content, frequency, and timing with consideration to the individual patient and illness.

Dietary Myths

Sugar

Misconception #1: Table sugar is better for you than processed sugar

Dispelling the Myth: All sugar products are made of sugar and should be consumed in moderation, regardless of composition or source.

High fructose corn syrup (HFCS) has been thought to significantly increase incidence of obesity and cardiovascular disease related to increases in blood glucose, lipid levels, and appetite, ultimately leading to weight gain (Sobel & Dalby, 2014). However, research shows no significant differences in blood glucose levels, lipid levels, and appetite with consumption of high fructose corn syrup (HFCS) compared to table sugar (Sobel & Dalby, 2014).

Effects of Sugar and HFCS on Glucose Levels

To test the effects of different amounts and types of sugar on blood glucose levels, Mitchell, Braun, Pizza, & Forrest (2000) administered varying concentrations of sugar solutions and a water placebo to participants, then checked blood glucose levels every 15 minutes over an hour. The blood glucose levels of the sugar and HFCS groups' were comparable to those in the water group (Mitchell et al., 2000).

Effects of Sugar and HFCS on Lipid Levels

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In a study conducted by Stanhope, Griffen, Bair, Swarbrick, Keim, & Havel (2008), lipid levels were compared across groups that consumed diets with 25% of ingested calories in the form of sucrose, HFCS, glucose, or fructose sweetened beverages. The study found no difference in the effect on low-density lipoprotein (LDL), high density lipoprotein (HDL), or total cholesterol levels based on the type of sugar consumed. Importantly, fasting triglyceride levels significantly increased the morning after consuming both HFCS and sucrose (Stanhope, et al., 2008). The elevated fasting triglyceride levels among those consuming more HFCS or sucrose is a significant finding since elevated triglyceride levels contribute to obesity rates (Sobel & Dalby, 2014).

A significant rise in triglyceride levels was seen by Livesay and Taylor (2008) after study participants consumed 50 grams or more of fructose. Over 50% of the adult population in the U.S. ingests at least this level of fructose daily (Sobel & Dalby, 2014). Evidence about the effect of sugar on lipid levels is significant for APNs to address in standard care of patients with risk factors for hyperlipidemia and those already diagnosed.

Effects of Sugar and HFCS on Appetite

In a study conducted by Soenen and Westerterp-Plantenga (2007), ghrelin levels of subjects were measured after consuming either sucrose or HFCS. Ghrelin is a hormone secreted in the stomach that stimulates the feeling of hunger (Sobel & Dalby, 2014). The study reported no difference in level of appetite between the groups (Soenen & Westerterp-Plantenga, 2007). This suggests that sugar intake does not have a direct effect on appetite.

Improved Patient Education Strategies for APNs Regarding Sugar and HFCS

There is not a significant difference on patient outcomes regarding glucose and lipid levels or appetite between HFCS and natural sugar products (Mitchell, et al, Stanhope, 2008,

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Soenen & Westerterp-Plantenga, 2007). To most effectively influence patient outcomes affected by APNs educating patients, discussion should focus on the level of fructose, the common ingredient in HFCS and sucrose, in consumed products. Currently, USDA-required food labels only describe total grams of sugar in a product, not level of fructose. APNs should educate patients on how to reduce overall sugar consumption by teaching patients and families how to interpret nutrition labels and seek alternatives for foods and beverages with high amounts of added sugar or HFCS. Additionally, strategies such as diluting beverages with high sugar content and substituting high-sugar snacks with dairy products, nuts, or vegetables can decrease daily sugar intake. During patient education sessions, the APN should emphasize that excessive consumption of sugar has been shown to have negative effects on the body and can potentially lead to elevated triglyceride levels, ultimately contributing to the potential for obesity. Focusing patient energy on the truth about the core ingredient gives them the opportunity to make meaningful and sustainable changes to their diet based on effective information, instead of fads or suggestions from social media or advertising strategies.

Misconception #2: Sugar is addictive

Dispelling the Myth: Higher fat foods were found to be more addictive than sugary.

Withdrawal from a sugar-rich diet has demonstrated withdrawal-like symptoms concurrent with illicit drug and alcohol use, leading to the idea that sugar could be addictive (Bray, 2016). The prolonged overconsumption of fructose has been found to have damaging metabolic effects by increasing visceral adipose tissue and increased triglyceride levels (Bray, 2016). Fructose has a sweeter taste than glucose, which is thought to contribute to lack of satiety (Bray, 2016). The potential addictive properties of sugar have been assessed using the Yale Food Addiction Scale (YFAS), which quantifies symptoms of “addiction-like eating” (Markus,

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Rogers, Brouns, & Schepers, 2017). The YFAS is comprised of eight scales, each focused on a clinical symptom of addiction: food taken in larger amounts and longer than intended; persistent desire or repeated unsuccessful attempt to quit; excess time or activity to obtain, use, and recover; important social, occupational, or recreational activities discontinued; continued use despite knowledge of adverse hazardous consequences; tolerance; withdrawal symptoms; and use causes significant impairment clinically (Markus, et al, 2017).

A study conducted by Markus, et al. (2017), found the most common and frequently experienced YFAS food addiction symptom in relation to macronutrient consumption was a “persistent desire or repeated unsuccessful attempt to quit”, reported by 93.8% of trial participants. The majority of participants experienced at least one YFAS symptom (95%) but only 12% received a clinical diagnosis of food addiction (Markus, et al., 2017). After further evaluation, most of the 95% experienced at least one YFAS symptom when combining a sweet food with savory food (Markus, et al., 2017). Only 5% of participants experienced a food addiction symptom directly related to sweet food intake alone (Markus et al., 2017). The study showed a higher percent of symptom presentation from ingestion of savory foods instead of sweet.

YFAS symptoms and BMI scores were significantly correlated and resulted in increased body weight (Markus, et al., 2017). Four groups of “problem foods” were identified: high-fat sweet (HFSW), high-fat savory (HFSA), sugar-sweetened foods, and low-fat savory (LFSA) (Markus, et al., 2017). BMI was highest in participants that reported problems with HFSA food, followed by HFSW, sugar, and low-fat savory foods (Markus, et al., 2017). If a patient were to demonstrate YFAS symptoms, it could indicate a higher risk for weight gain and potential

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development of obesity. APNs should be aware of manifestations of YFAS symptoms to emphasize a healthier approach to high-fat foods and reduce unwanted weight gain.

Improved Patient Education Strategies for APNs Regarding the Addictive Properties of Sugar

Overall, sugar-specific foods hold less addiction potential than HFSW and HFSA foods. The U.S. Department of Agriculture does not recognize fats as a food group but emphasizes the need for fatty acids and other nutrients in fats as part of a healthy diet (USDA, 2016). Ingested fats can be found in fish, nuts, and vegetable oils and should be polyunsaturated or monounsaturated and liquid at room temperature (USDA, 2016). These polyunsaturated or monounsaturated fats do not raise LDL levels, unlike saturated or trans-fats which are found in butter and shortening and are solid at room temperature (USDA, 2016). It is important for APNs to educate patients during nutrition counseling sessions on the harmful potential of food products with added sugars and fats. By helping patients learn about and identify healthy food choices, APNs are helping the patient take a lead in managing their caloric intake, prevent obesity, and ultimately live a healthier life.

Dairy

Misconception #3: Milk makes you skinny

Dispelling the Myth: Dairy products can be a positive part of weight management.

Dairy products such as milk provide a variety of nutrients including calcium, vitamin D, potassium and protein (LiPuma, 2017). A common misconception is the ingestion of milk significantly impacts weight loss strategies. Milk is a good source of protein, which is important during weight loss and weight maintenance due to a high satiating effect, which helps prevent over-consumption of calories, subsequently reducing body fat stores (Thorning, Raben,

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Tholstrup, Astrup, Soedamah-Muthu, & Givens, 2016). Additionally, milk is rich in amino acids, which contribute to muscle protein synthesis and maintaining metabolically active muscle during weight loss (Thorning, et al., 2016). Although milk offers many benefits towards the potential for weight loss, research does not confirm that high intake of milk specifically, results in weight loss. A study by Lu, Xun, Wan, He, and Cai (2016) found a study where children in a group of high-dairy intake were 38% less likely to become obese than those in the group of lowest dairy intake. A 0.65% lower body fat (p-value of 0.07) and 13% lower risk of obesity was associated with just a one daily serving increase of dairy (Lu, et al., 2016). Thorning, et al. (2016) found multiple studies indicating adults were also found to glean benefits from high dairy consumption. Improved weight loss and body composition, or reduced body fat mass and increased lean body mass, were found by increasing dairy intake during a short-term period. However, changes became insignificant during longitudinal studies. Phillips (2012) concluded a high dairy diet was effective for weight loss during a short-term period, finding 1.29 kg greater weight loss, 1.11 kg greater reduction in body fat mass, .072 kg gain in lean mass, and 2.43 cm reduction in waist circumference.

Improved Patient Education Strategies for APNs Regarding Dairy and Weight Loss

Based on the available research, a diet high in dairy products can support short-term weight loss, but this is not specific to milk. Dairy can help lower the risk of developing Type II diabetes, hypertension, osteoporosis, and certain types of cancer by assisting with weight loss management, regulating blood pressure, strengthening bone makeup, and maintaining homeostasis (Thorning, et al., 2016). APNs can offer nutritional advice during patient education sessions by discussing the various benefits of dairy products and top dairy product choices; choosing dairy products such as milk, cheese, and yogurt with lower percentages of fat, added

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sugar, and sodium is the healthiest option (USDA, 2016). Patients can also be educated on alternatives or substitutes to common higher-fat dairy products such as trading sour cream for plain yogurt, or choosing skim milk over whole milk, to reduce fat and sugar intake (USDA, 2016). APNs should also be knowledgeable about the current recommendations related to the needs of lactose free patients, offering similar education on best lactose-free dairy choices, quality substitutes, and additional ways in which the patient can consume protein, vitamin D, potassium, and calcium. This nutritional education is a key piece of an APNs obligation as a health care provider to help engage patients in reducing their individual risk of developing chronic diseases.

Misconception #4: Yogurt helps regulate the digestive tract

Dispelling the Myth: Probiotics have benefits for ill and healthy patients alike.

Clinical investigation of the role of probiotics in health began in the 1990s and has shown a wide array of benefits (Sanders, Merenstein, Merrifield, & Hutkins, 2018). In a marketplace setting, probiotics are found in one of three categories: food, dietary supplements, and pharmaceuticals (Sanders, et al., 2018). Nutritional status is directly affected by the function of the bacteria in the gut with colonization of these microbes, specifically through the ingestion of food containing probiotics having positive response on certain dietary patterns (David, et al., 2014).

While the common misconception is that yogurt with added probiotics “puts the digestive tract back in order”, research has not confirmed this claim. There is little evidence supporting significant impact of probiotics on the overall makeup of gut bacterial communities, besides the initial increase of the strain of bacteria being consumed (Kristensen, et al., 2016). The presence of ingested probiotics from a certain food product rarely persists in the gut for more than a few

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weeks (Sanders, et al., 2018). Research is limited on the influence of probiotics on the regulation of digestion; However, there are substantial clinical benefits to probiotic intake. Benefits include treating colic and acute diarrhea, preventing food hypersensitivity, and preventing enterocolitis in infants (Sanders, et al., 2018). Additionally, probiotics manage symptoms of constipation, reduce incidence and duration of gastrointestinal disease, and improve efficacy of antibiotic therapy in adults (Sanders, et al., 2018).

Probiotics are not only beneficial for those with an illness, but research shows probiotics are just as beneficial for healthy patients. King, Glanville, Sanders, Fitzgerald, & Varley (2014) found that probiotics can modestly decrease the duration of common upper respiratory disease. Probiotics have also been found to have a positive effect on managing blood lipid levels in patients with mild hypercholesterolemia (Sanders, et al., 2018). However, these benefits may depend on the strain of probiotics ingested along with the host's diet, physiology, and pre-existing gut microflora.

Improved Patient Education Strategies for APNs Regarding the Effects of Probiotics

The sales of probiotics are not currently regulated by a governmental body, such as the Food and Drug Administration. Because of a lack of regulation in clinical practice APNs should be prepared to teach patients to accurately interpret probiotic product labels. A probiotic label contains information such as active and inactive ingredients, the genus, species, and strain of probiotic, recommended use, colony forming units (CFUs), and daily dosage (Sanders, et al., 2018). Particularly important are the CFUs, which should be guaranteed to remain active through the product's shelf life and should match doses of between 10^9 to 10^{11} CFUs used in previous studies on humans that have demonstrated health benefits (Sanders, et al., 2018). It is probable probiotics as pharmaceuticals will be specifically formulated in the future to more directly target

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certain disease processes (Sanders, et al., 2018). APNs can help patients become aware of the transient benefits of probiotics and the potential to improve overall health both when healthy and ill.

Hydration

Misconception #5: Everyone should drink eight glasses of water a day

Dispelling the Myth: Hydration is individual. There is no set daily water requirement.

Water has several proposed benefits outside of cellular regulatory function, including improving cognition, regulating the gastrointestinal system, and keeping skin clear and blemish-free (Tuft's University Health and Nutrition Letter, 2014). The body's central nervous system and hormones are constantly working to maintain homeostasis and adapting to internal and external stimuli (Armstrong & Johnson, 2018). A diet high in salt, protein, caffeine, or alcohol increases acute fluid needs (Dow, 2018). Salt and protein shift the fluid balance between intra- and extra-cellular spaces and therefore needs to be replaced (Dow, 2018). Alcohol and caffeine both act as diuretics, increasing urine output (Dow, 2018). Physical activity level and age also play an important role in determining hydration needs; a high level of physical activity results in a higher rate of fluid lost through increased respirations and sweat, while older age lessens the body's ability to recognize thirst and places a patient at greater risk for dehydration (Dow, 2018).

8-by-8 Rule

The 8-by-8 rule, or drinking 8, eight-ounce glasses of water a day, has been a popularly promoted, but not evidence-based, method for encouraging adequate hydration (Mosher, 2016). Many factors must be considered when calculating individual hydration needs, which is why a standardized water requirement has thus far been elusive.

WUT Criteria

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A clinical indicator of hydration status is urine output, which should be at least 30 milliliters an hour of pale-yellow urine that does not have an odor (Henry, 2016). Dow (2018) suggests using the weight, urine color, and thirst (WUT) criteria to assess for dehydration (2018). Weight loss of more than 1% of a person's average morning weight, urine that is dark yellow or brown in color, or thirst to the point where it is difficult to form saliva are all indicators of dehydration (Dow, 2018).

AVP Values

Armstrong and Johnson (2018) proposed a method of assessing hydration needs that considers individualized variables by focusing on a chemical biomarker that indicated a well hydrated state. A plasma arginine vasopressin (AVP) value of 2.0 pg/mL was associated with a euhydrated, or balanced, state and achieved by drinking approximately 1.8 liters of water per day. Values above 2.0 pg/mL indicated inadequate hydration and, when maintained chronically, contributed to a number of negative health outcomes.

Matching Fluid and Caloric Intake

Another method for calculating daily water requirements factors in individual variables, including age, weight, sex, dietary intake, and physical activity, and suggests matching fluid intake with caloric intake. For example, if 2,300 calories were ingested, 2,300 milliliters of fluid should be ingested as well. This method is unique because it includes all forms of ingested fluid, including juices, sodas, and liquid in foods (Tuft's University Health and Nutrition Letter, 2014). However, this method does not take into consideration calories consumed from liquids other than water, which could contribute to weight gain if continued over a prolonged period.

Improved Patient Education Strategies for APNs Regarding Hydration

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Meeting adequate daily fluid requirements can be difficult but is crucial for normal physiological and anatomical function. Proper hydration is essential for more than just healing, as the body uses water in almost all of its normal cellular functioning. Water is also lost naturally through sweat, respirations, urination, or defecation and must be replaced in the same volume. APNs play an important role in monitoring and maintaining a patient's hydration status, as various disease processes and lifestyle factors require different amounts of fluid intake. This review did not find any studies comparing different hydration techniques in day-to-day practice or an increase in benefits of one method of hydration over another. When managing a patient's hydration status, APNs can utilize and then teach patients from the various methods of calculating individual hydration needs. If a patient is reluctant to drink only water, juices without added sugar, low-fat milk, or unsweetened tea or coffee can be encouraged in limited amounts. Placing liquids in a container that the patient enjoys or has chosen themselves may also inspire increased fluid intake. Since there is not a singular best method of assessing and calculating individual hydration needs, APNs should utilize a hydration technique that is feasible and understandable to their specific patient population.

Eating Patterns

Misconception #6: Breakfast is the most important meal of the day.

Dispelling the Myth: Breakfast consumption may be beneficial, but more research is needed.

Approximately two-thirds of the US population is considered overweight or obese (Raynor, Goff, Poole, & Chen, 2018). Optimal meal frequency, timing, and size are important aspects of nutrition that lack scientific evidence, and lack of knowledge in these areas may contribute to the obesity epidemic (Kahleova, Lloren, Mashchak, Hill, & Fraser, 2017). A key

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area in treatment of obesity is the reduction of caloric energy intake (Raynor, et al., 2018).

Reduced energy intake proportionate to weight and body mass index (BMI) is associated with greater appetite control, weight-loss, and long-term weight maintenance (Raynor, et al, 2018).

Although often referred to as “the most important meal of the day”, there has been a steady decline in breakfast consumption in recent years, despite evidence demonstrating the health benefits, including a reduction in post-meal cravings and a decreased incidence of obesity (Baum, Gaines, Kubas, Mitchell, & Russell, 2017). In order to properly manage patient weight and prevent the incidence of obesity, APNs should understand the implications of meal frequency and timing.

“Grazing”

There is currently conflicting data on the effects of meal frequency on body weight, studied only in small trials over short periods of time (Kahleova, et al, 2017). The habit of “grazing”, or eating several small meals throughout the day, has been a proposed method of improving weight loss strategies (Raynor, et al, 2018). A review performed by Raynor, et al (2018) found 16 studies conducted in laboratory and field settings that manipulated meal frequency, ranging from one to nine meals in an experimental session or day. The results of the studies for energy expenditure, self-reported appetite, weight, cholesterol measures, and blood glucose measurements all had mixed outcomes, and many studies reported no significant differences in these areas from the effect of eating frequency (Raynor, et al., 2018). This may indicate that “grazing” may not play a significant role in weight loss.

Meal Timing

Unlike meal frequency, there is more established data related to meal timing. Kahleova et al. (2017) investigated both meal timing and size by varying length of overnight fast, breakfast

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consumption, and meal size of breakfast, lunch, and dinner. Subjects fasting overnight experienced a relative decrease in annual BMI compared to short and medium fasts (Kahleova, et al., 2017). Those that ate breakfast had a decrease in BMI compared to those who did not eat breakfast; subjects that also made breakfast their largest meal of the day saw the largest decrease in BMI compared to those that made lunch or dinner their biggest meal (Kahleova, et al., 2017). There is still a need for further research on optimal meal timing and size, but the results of this study indicate that consuming a larger breakfast may be beneficial to weight management.

Improved Patient Education Strategies for APNs Regarding Eating Habits

Due to conflicting results, there is a need for more research on meal frequency, timing, size, particularly breakfast. Without solid evidence that any one eating pattern is truly superior for weight management or health, APNs should support any reasonable eating pattern that provides for a patient's needs and allows them to follow evidence-based guidelines around total food intake. APNs should reinforce portion control and a balanced diet for all meals to patients. The USDA currently has an initiative called "MyPlate" that serves as a reminder for both healthy eating patterns and appropriate amounts of food to consume based on the food group. The colorful "My Plate" graphic is comprised of a quarter each of fruits, vegetables, grains, and protein. "MyPlate" focuses on variety, amount, and nutrition of food, and highlights the importance of choosing foods and beverages with limited sodium, added sugar, and fat. The USDA suggests making half "your plate" fruits and vegetables and if consuming grains, making half of the grains, whole grain. APNs can use available resources like the "MyPlate" graphic to help translate accurate information on healthy eating at an understandable and retainable level for patients.

Strategies for Patient Education

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Providing proper patient education is a vital role of an APN holds managing a patient's care and health outcomes. Effective teaching by an APN can improve patient knowledge, skills, self-care capabilities, and ability to make informed decisions (Flanders, 2018). Teaching is a skill that APNs must practice in order to engage with patients in a meaningful way in and meet their individual learning needs (Flanders, 2018). Quality patient education can lead to enhanced patient knowledge, reduced hospital readmission rates, and improved medication adherence; ineffective or a lack of patient education may lead to misunderstandings and a high risk for adverse patient outcomes (Flanders, 2018).

In order to provide excellent patient teaching, APNs should perform a learning needs assessment for each patient upon admission. A learning needs assessment determines a patient's readiness and ability to learn and learning preferences (London, 2016). Many individual factors influence a patient's learning threshold, including health literacy, age, culture, and prior experiences (Flanders, 2018). Utilizing this knowledge can help APNs individualize teaching based on the patient's education needs or restrictions (London, 2016).

After a learning needs assessment, APNs should prepare for their education session with the patient. It is crucial that appropriate teaching aids or supplies are available and the APN is familiar with the content and proficient with the aid prior to beginning the education session (Engelke & Schub, 2016; London, 2016). Materials and aids should also be geared towards the patient's learning style (Flanders, 2018). Teaching sessions can be planned or unplanned, but in any scenario, the patient should be ready to learn, aware of the information being presented, and why the information is useful to learn and implement (Flanders, 2018). APNs should limit teaching points to one to three per session to facilitate patient understanding and retention (Engelke & Schub, 2016).

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Teach Back Method

The teaching method with the highest shown rates of efficacy, increased patient knowledge, and adherence is the teach-back method (Flanders, 2018). This process has the patient explain what was taught to them, in their own words, so the APN can assess comprehension. Open-ended questions should be utilized concurrently with the teach-back method to aid the APN in this assessment and to maximize patient understanding (London, 2016). Education sessions should be repeated until the patient achieves the desired learning goals (Flanders, 2018).

Other Teaching Methods

Other forms of teaching include use of visual materials, video instruction, and skill demonstration. Visual materials should be succinct and highlight information pertinent to that particular patient (Flanders, 2018). Patients should also be given adequate time to review these materials before reviewing with an APN (Flanders, 2018). For video instruction, the patient should be aware of what they will learn and prepared for the APN to return and review the content after viewing (Flanders, 2018). Finally, skill demonstration is a three-step process: the APN teaches the skill, the patient practices the skill with the APN observing, correcting any mistakes in the procedure, then the patient performs the skill independently (London, 2016). Repeating the skill independently three times is recommended to ensure understanding and promote adherence (London, 2016).

Effective teaching methods can improve patient knowledge, skills, abilities, and likelihood to adhere to clinical recommendations (Flanders, 2018). A patient's learning style and education deficits should always be addressed prior to beginning a patient education session

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(Flanders, 2018). Patient education is an important aspect of an APNs' skill set and should be constantly practiced and adapted based on patient needs and abilities.

Conclusion

As the obesity epidemic continues to become more prevalent, it is imperative that all clinicians, particularly APNs, place a focus on healthy habits when educating their patients, particularly about diet. Believing misconceptions regarding the discussed topics of sugar, dairy, hydration, and eating patterns can lead to nutrient imbalances and ultimately place patients at a greater risk for developing obesity and other chronic diseases. Advanced practice nurses have an obligation to dispel these myths for their patients and emphasize current, evidence-based information during education sessions. Proper patient teaching needs to be consistently practiced and individualized per patient in order to be optimally effective. By bringing the truth about dietary misconceptions to the table in effective and understandable ways, APNs have the opportunity to facilitate the best and healthiest lives of their patients.

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References

- Armstrong, L. E., & Johnson, E. C. (2018). Water intake, water balance, and the elusive daily water requirement. *Nutrients*, *10*(12), 1928.
- Bray, G. A. (2016). Is sugar addictive? *Diabetes*, *65*(7), 1797–1799.
- David, L. A., Maurice, C. F., Carmody, R. N., Gootenberg, D. B., Button, J. E., Wolfe, B. E., Ling, A. V., Devlin, A. S., Varma, Y., Fischbach, M. A., Biddinger, S. B., Dutton, R.J., & Turnbaugh, P.J. (2014). Diet rapidly and reproducibly alters the human gut microbiome. *Nature* *505*: 559– 63.
- Dow, C. (2018). Bodies of Water: How much--and which kind--of H²O do you need? *Nutrition Action Health Letter*, *45*(7), 7–9.
- Engelke, Z., & Schub, T. (2016). Patient education: Determining appropriate teaching methods. *CINAHL nursing guide*. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=nup&AN=T706490&site=eds-live&group=test>
- Flanders, S. A. (2018). Nurses as Educators. Effective patient education: Evidence and common sense. *MEDSURG Nursing*, *27*(1), 55–58.
- Friedman, A. J., Cosby, R., Boyko, S., Hatton-Bauer, J., & Turnbull, G. (2011). Effective teaching strategies and methods of delivery for patient education: a systematic review and practice guideline recommendations. *Journal of Cancer Education*, *26*(1), 12–21.
- Henry, N.J.E., McMichael, M., Johnson, J., DiStasi, A., Holman, H.C., Hertel, R. A., Wilford, K. L., Leehy, P., & Lemon, T. (2016). *Nutrition for nursing* (6th edition).
- How much water do you really need? (2014). *Tufts University Health & Nutrition Letter*, *32*(5), 1–5.
- Kahleova, H., Lloren, J. I., Mashchak, A., Hill, M., & Fraser, G. E. (2017). Meal frequency and

DISPELLING COMMON DIETARY MYTHS

- timing are associated with changes in body mass index in adventist health study 2. *Journal of Nutrition*, 147(9), 1722–1728.
- King, S., Glanville, J., Flanders, M.E., Fitzgerald, A., & Varley, D. (2014) Effectiveness of probiotics on the duration of illness in healthy children and adults who develop common acute respiratory infectious conditions: a systematic review and meta-analysis. *British Journal of Nutrition* 112: 41– 54.
- Kristensen, N. B., Bryrup, T., Allin, K. H., Nielsen, T., Hansen, T. H., & Pedersen O., (2016). Alterations in fecal microbiota composition by probiotic supplementation in healthy adults: a systematic review of randomized controlled trials. *Genome Medicine* 8: 52.
- LiPuma, C. (2017). Celebrate dairy for health benefits. *Food Insight*, 1.
- Livesay, G., & Taylor, R. (2008). Fructose consumption and consequences for glycation, plasma triacylglycerol, and body weight: Meta-analysis and meta-regression model of intervention studies. *American Journal of Clinical Nutrition*, 88(5), 1419-1437.
- London, F. (2016). *No time to teach: The essence of patient and family education for health care providers* (2nd ed.). Atlanta, GA: Pritchett & Hull.
- Lu, L., Xun, P., Wan, Y., He, K., & Cai, W. (2016). Long-term association between dairy consumption and risk of childhood obesity: a systematic review and meta-analysis of prospective cohort studies. *European Journal of Clinical Nutrition*, 70(4): 414-423.
- Malik, S., Blake, H., & Batt, M. (2011). How healthy are our nurses? New and registered nurses compared. *British Journal of Nursing*, 20(8), 489–496.
- Markus, C. R., Rogers, P. J., Brouns, F., & Schepers, R. (2017). Eating dependence and weight gain; no human evidence for a “sugar-addiction” model of overweight. *Appetite*, 114, 64–72.

DISPELLING COMMON DIETARY MYTHS

- Mitchell, J. B., Braun, W. A., Pizza, F.X., & Forrest, M. (2000). Pre-exercise carbohydrate and fluid ingestion: Influence of glycemic response on 10-km treadmill running performance in the heat. *Journal of Sports Medicine and Physical Fitness*, 40, 41-50.
- Mosher, D. (2016). 49 health 'facts' you've been told all your life that are totally wrong. Retrieved from <https://www.businessinsider.com/worst-science-health-body-myths-2016-8>
- Phillips, S. M. (2012). Optimizing body composition during weight loss: The role of milk products. *Canadian Nurse*, 108(9), 5.
- Raynor, H. A., Goff, M. R., Poole, S. A., & Chen, G. (2015). Eating frequency, food intake, and weight: A systematic review of human and animal experimental studies. *Frontiers in nutrition*, 2, 38.
- Sanders, M. E., Merenstein, D., Merrifield, C. A., & Hutkins, R. (2018). Probiotics for human use. *Nutrition Bulletin*, 43(3), 212–225
- Sesser, J. R. (2018). Patient education in the medical setting. *Journal of Continuing Education Topics & Issues*, 20(2), 52–57.
- Sobel, L. L., & Dalby, E. (2014). Sugar or high fructose corn syrup-What should nurses teach patients and families? *Worldviews on Evidence-Based Nursing*, 11(2), 126–132.
- Soenen, S. & Westerterp-Plantegna, M. (2007). No difference in satiety or energy intake after high-fructose corn syrup, sucrose, or milk preloads. *The American Journal of Clinical Nutrition*, 86(6), 1586-1594).
- Stanhope, K. L., Griffen, S. C., Bair, B. R., Swarbrick, M. M., Keim, N. L., & Havel, P.J. (2008). Twenty-four-hour endocrine and metabolic profiles following consumption of high-fructose corn syrup-, sucrose-, fructose-, and glucose-sweetened beverages with

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meals. *The American Journal of Clinical Nutrition*, 87(5), 1194-1203.

Thorning, T. K., Raben, A., Tholstrup, T., Astrup, A., Soedamah-Muthu, S. S., & Givens, I.

(2016). Milk and dairy products: good or bad for human health? An assessment of the totality of scientific evidence. *Food & Nutrition Research*, 60, 1–11.

U.S. Department of Agriculture (2016). *How are oils different from solid fats?* Retrieved from <https://www.choosemyplate.gov/oils-fats>

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Appendix A



UNIVERSITY OF
SOUTH CAROLINA
College of Nursing

Bringing Truth to the Table: An Evidence Review to Dispel Common Dietary Myths

Madison Pierce, BSN Student

Mentors: Victoria H. Davis, DNP, APRN, CPNP-PC
& Kate K. Chappell, Ph.D., APRN, CPNP-PC

Clinical Problem

- Healthy habits can be difficult to implement.
- Contributing factors:
 - ❖ Cost of food
 - ❖ Location of grocery stores (or lack thereof)
 - ❖ Time and access to researched health habits
- Accessible, accurate information on diet can bridge the gap between intake and recommendations¹¹.
- As educators, nurses have an obligation to establish rapport with patients.
 - ❖ This increases likelihood of patient to heed healthy habits advice⁹.
 - ❖ Patients involved in their plans of care tend to have better health outcomes¹².

"Drink 8 Glasses of Water a Day"

The internet says... "everyone should drink eight glasses of water a day!"



The evidence says... there are many methods of determining adequate hydration

- ❖ WUT criteria (weight, urine color, thirst)³
- ❖ Matching caloric intake with milliliters of water⁶
- ❖ CDC recommendations (12.5 cups/day for men, 9 cups/day for women)³
- Also consider age, weight, physical activity level, climate, and dietary intake¹.

"Sugar is Addictive"

The internet says... "sugar is as addictive as heroin!"

The evidence says... food addiction symptoms are more related to high-fat sweet and savory foods¹⁰.

- The Yale Food Addiction Scale was developed to quantify "addictive-like eating" for sugar¹⁰.
 - ❖ 7/8 symptoms were reported rarely
- Sugar intake should be limited to <10% of daily caloric intake (<40 g/day)¹⁵.

"Breakfast is the Most Important Meal of the Day"

The internet says... "you need to eat breakfast!"

The evidence says... unclear whether benefits come from breakfast as a meal or composition of the meal⁴

- Eating breakfast reduces post meal cravings and obesity².
- Meals eaten later in the day adversely affect weight loss attempts⁷.
- Meal composition should be balanced with daily values of carbohydrates, protein, dairy, fruits and vegetables.



Literature Review

- Lay literature used to identify six common dietary myths.
 - A review using CINAHL was then conducted on these misconceptions
- Goal of the review was to improve nurse's knowledge.
- Studies reviewed by topic:
 - ❖ Misconception identification (3)
 - ❖ Available knowledge on misconceptions (19)
- Search terms included:
 - ❖ "popular diet myths"
 - ❖ "sugar", "dairy", "probiotics", "water", "hydration", "breakfast", "eating habits" AND "health benefits", "nursing", "patient education"

Patient Education Strategies

- Nurses can use "debunked" information to apply to individual patient teaching.
- Nursing process is one technique for effective patient education¹².
- Other teaching methodologies include¹⁴:
 - ❖ One-on-one education
 - ❖ Role play and demonstration
 - ❖ Discussion
 - ❖ Motivational interviewing
 - ❖ "Teach back" method
 - ❖ Use of visual materials
- Goal is for patient to understand, relate, and retain information¹⁴.

"Processed Sugar is Worse Than Natural Sugar"

The internet says... "high fructose corn syrup is far worse than sugar!"

The evidence says... fructose intake of >50g/day is harmful¹⁵.

- Natural sugar, or sucrose, is found in fruits and honey (50% glucose, 50% fructose)¹⁵.
- High fructose corn syrup is an industrially used sugar substitute (>55% fructose content)¹⁵.
- High fructose corn syrup and sucrose were tested and found to have no difference in effect on¹⁵:
 - ❖ Blood glucose levels
 - ❖ Lipid levels
 - ❖ Appetite
 - ❖ Weight gain
- Overconsumption of fructose produced a significant rise in triglyceride levels¹⁵.



"Probiotics Help Regulate Gut Function"

The internet says... "yogurt will help put your digestive system back in order!"

The evidence says... probiotics are beneficial for gastrointestinal and urinary tract health⁵.

- Proven to reduce rates of¹³:
 - ❖ Antibiotic associated diarrhea
 - ❖ Ulcerative colitis flare-ups
 - ❖ Incidence and duration of common infectious diseases

"Milk Makes You Skinny"

The internet says... "milk can help you lose weight!"

The evidence says... unclear whether weight loss is from milk specifically or calcium content¹⁶.

- Diets high in dairy resulted in¹¹:
 - ❖ Greater weight loss
 - ❖ Reduction of body fat mass
 - ❖ Gain in lean mass
 - ❖ Reduction in weight reduction
- Adequate daily calcium intake should be ingested (1,000 mg/day)⁸.

