

Perceptions of and Barriers to Dietary Counseling among Adults with Type II Diabetes

By

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Abstract

Problem: Type II diabetes (T2D) is a common occurrence in healthcare and found in nearly every part of the world. Epidemiological evidence suggests that, without effective prevention and control programs, the burden of diabetes will continue to increase globally. Programs involving dietary counseling have proven efficacious for improving a range of outcomes in T2D, including a decrease in the HbA1c by 0.5-2%, and have been shown to prevent or postpone associated comorbidities. Despite the endless benefits dietary counseling can provide, little is known about patient perceptions regarding dietary counseling. Furthermore, there is a lack of evidence on the various barriers patients face in adhering to the dietitian's recommendations.

Project Purpose: One of the Healthy People 2020 objectives is to reduce diabetes and its economic burden as well as improve the quality of life for all persons who have, or are at risk for, diabetes. Additionally, the Standards of Medical Care in Diabetes published by the American Diabetes Association in January 2017 recommends a dietary counseling program, preferably by a registered dietitian (RD), for all people with diabetes. In considering the influence dietitians have on promoting lifestyle interventions, the purpose of this quality improvement project was to determine patients' perceptions of dietary counseling and the barriers faced in adhering to the dietitian's recommendations. The project sample included adults age 18 and older who have T2D, are of either gender, and any race or ethnicity. Pender's health promotion model was the applied theoretical framework for this project.

Project Method: The project took place at the South Branch Library in Kansas City, Kansas. The sample was derived from patients who attend Silver City Health Clinic (SCHC), an underserved urban clinic in Kansas City, Kansas. Patients who met the inclusion criteria were encouraged by their providers to attend any or all of the eight dietary sessions that were free to attend and were conducted by a RD and RN employed by SCHC. A survey was administered at the end of the sessions to evaluate patients' perceived benefits of the dietary counseling they received, along with the barriers they believed may impede adherence to the recommendations.

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Introduction

Diabetes affects people of all ages, genders, and ethnicities. According to the American Diabetes Association ([ADA], 2016), 1.4 million Americans are diagnosed with diabetes every year, and it remains the seventh leading cause of death in the United States. Many comorbidities are associated with diabetes, including hypertension, dyslipidemia, cardiovascular disease, blindness and retinopathy, renal disease, and lower-limb amputations (ADA, 2016; World Health Organization [WHO], 2016). To prevent and control the associated comorbidities of diabetes, patients require both self-motivation and the support of a multidisciplinary team (Daley & Wallymahmed, 2014). Dietitians are a vital member of the team, providing counseling on topics such as weight management, increasing physical activity, and making diet and lifestyle modifications, which are all recommended as first-line treatments for diabetes (Daley & Wallymahmed, 2014). For the purpose of this project, the focus was on the perceptions of and barriers to dietary counseling among adults with type II diabetes (T2D).

Background and Significance of Problem

Diabetes mellitus and all of its forms (type I, type 1.5, type II, diabetes insipidus, gestational diabetes, prediabetes, glucose intolerance, impaired glucose tolerance, impaired fasting glucose) is worldwide (WHO, 2011). Until recently, T2D was seen only in adults, now it occurs more frequently in children (WHO, 2016). One person dies every seven seconds from diabetes, with 50% of the deaths occurring in those below the age of 60 (Mukonka et al., 2016). In addition to potentially causing a number of complex medical conditions, diabetes lowers an individual's life expectancy by up to 15 years (Healthy People 2020, 2016). The combination of two key behaviors – physical inactivity and poor diet – have become two of the leading causes of premature death in the United States, and contribute to a multitude of chronic diseases, including

T2D (Bauer, Briss, Goodman, & Bowman, 2014). The WHO (2011) reported that without effective prevention and control programs, the burden of diabetes is likely to continue to increase globally. Because of this phenomenon, diabetes is causing a major deleterious impact on both an individual and international level (WHO, 2011). Managing diabetes requires a multidisciplinary approach, and proper nutrition is a significant facet to help reduce the global burden of the diabetes epidemic (Mir, Zafar, & Griffing, 2015).

While it can be extremely difficult for people with T2D to change their dietary patterns, it is beneficial not only towards improving the condition of diabetes itself but also towards overall health. It is important to be realistic when selecting dietary goals in order to prevent setting yourself up for failure. Both primary care providers (PCP) and dietitians play a large role in helping patients achieve realistic dietary goals (Booth & Nowson, 2010). PCPs agree that nutrition is important in managing disease, but often times face many obstacles in providing lifestyle advice to patients, such as time constraints, lack of training, lack of incentives or reimbursement, or in the case of T2D, complexity of advice (Booth & Nowson, 2010).

Managing patients with chronic diseases and multiple comorbidities is perhaps the greatest challenge confronting PCPs (American College of Preventive Medicine, 2009). Diabetes is considered to be one of the most psychologically and behaviorally demanding of the chronic diseases, requiring frequent and ongoing self-care and lifestyle interventions, principally dietary modifications (Uchenna, Ijeoma, Pauline, & Sylvester, 2010). An important objective established by *Healthy People 2020* (2016) is to reduce the disease and economic burden of diabetes and improve the quality of life for all persons who have, or are at risk for, diabetes. Moreover, the ADA's 2017 Standards of Medical Care in Diabetes includes the recommendation that a dietary counseling program, preferably provided by a registered dietitian (RD), support all

people with type I or type II diabetes (ADA, 2017). From these two imperative endorsements, it may be possible to achieve additional reduction in the risk of diabetes or its complications by influencing various behavioral risk factors, such as specific dietary choices (Office of Disease Prevention and Health Promotion [ODPHP], 2016). Therefore, it is vital that providers and dietitians understand the value patients place on dietary counseling and barriers to adherence.

Problem Statement

It is common knowledge that RDs deliver education and counseling on various lifestyle interventions, and therefore, play a large role in the prevention and maintenance of many chronic conditions, specifically T2D. Dietary counseling provided by an RD has been shown to prevent or postpone the numerous complications of this disease (Dorcey, 2013). Despite the endless benefits RDs can provide, many people are unaware of the services they have to offer (Dorcey, 2013). Additionally, little is known about a patient's perceptions and viewpoints in regards to the education they receive from a RD. There is also a lack of evidence on the various barriers that prevent patients with T2D from adhering to the dietitian's recommendations. Consequently, this project proposed the following objectives: (1) develop evidence-based strategies based on the results from the data collection that incorporate the perceptions of and barriers to dietary counseling for patients, and (2) present the findings to the public as well as submit the findings for publication. In doing so, it is anticipated that healthcare professionals (HCP) will become more knowledgeable on patient perspectives concerning dietary counseling, while also discovering ways to be more accommodating, with the ultimate goal of improving dietary adherence among patients with T2D.

Statement of Purpose

The purpose of this project was to explore the following: (1) the perceptions of dietary counseling, including the effectiveness and value, by patients with T2D, and (2) barriers patients face in adhering to the dietitian's recommendations. The specific PICO (phenomenon of interest in context) question is: *What are the perceptions of and barriers to dietary counseling among adults who have type II diabetes?*

Concepts/Variables

Several variables were identified in developing the PICO question including *patients' perceptions, barriers for adherence, and dietary counseling*. These will now be discussed.

Defining the Variables

Patients' Perceptions. This variable is the process by which people translate sensory impressions into a coherent and unified view of the world around them (Funch, n.d.).

Perceptions vary from person to person, and people perceive things differently about the same situation. According to Funch (n.d.), perceptions allow people to assign different meanings to different things, and therefore, there is really no fixed meaning to any given situation.

Perception also guides human behavior and allows us to take the information we are given and turn it into something meaningful (Funch, n.d.).

Barriers for Adherence. A barrier is "a circumstance or obstacle that prevents or impedes progress" (Barrier, 2017). Certain factors, or barriers, can interfere with the patient's healthcare regimen, making adherence difficult. The potential negative aspects of a particular health action may act as impediments to undertaking the recommended behavior. Reasons for non-adherence may include, but are not limited to, denial of the problem, cost or financial burden, difficulty of the regimen, lack of trust, lack of transportation, and apathy (Torrey, 2016).

Dietary Counseling. Defined as the education an individual or group of individuals receives regarding their medical condition's dietary needs. This education is typically provided by an RD who is an expert in the field of food and nutrition and has received specific education and training on how to manage various health conditions via counseling (Slawson, Fitzgerald, & Morgan, 2013). RDs provide services that include the following: devising customizable diet plans tailored to patients' values, beliefs, and culture; providing counseling on diet modifications; assisting patients in setting and achieving goals, such as weight loss or improved lab scores (i.e., reducing blood glucose and HbA1c); and collaborating with providers and other HCPs on a regular basis (Slawson et al., 2013). According to the RD who conducted the dietary sessions for this project, dietary counseling typically consists of three major elements: 1) Performing a comprehensive nutrition assessment to determine a nutrition diagnosis; 2) Planning and implementing a nutrition intervention using evidence-based nutrition practice guidelines; and 3) Monitoring and evaluating an individual's progress over subsequent visits with the dietitian.

Measuring the Variables

Patient's Perceptions. For this project, a survey was administered at the end of each session, post-dietary counseling, to gather the perceptions of patients with T2D. Each participant attending the dietary sessions received the survey. However, once a participant completed a survey, they did not complete it again if they attended dietary sessions thereafter. The survey assessed the patient's perceptions on the education, information, and material they received in the dietary counseling session(s), along with their perceived benefits of such dietary changes.

Barriers for Adherence. Throughout this project, the various barriers patients with T2D faced in adhering to the dietary recommendations were also explored and measured via the survey.

Dietary Counseling. The goals of dietary counseling are to promote and support healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion size, in order to improve overall health (Evert et al., 2013). This variable was measured by the content that was presented during the counseling sessions. Prior to carrying out the dietary sessions, the RD and RN discussed these topics as options for presenting: anthropometric measures such as target HbA1c, blood pressure, cholesterol, and body mass index (BMI); physical activity; 24-hour diet recall; self-monitoring of blood glucose; frequency of dining out per week; reading food labels; and patient willingness to make lifestyle changes. These topics, along with others, were assessed by the project leader who attended all of the sessions, observed and interacted with the participants, and collected data via the survey provided at the end of the counseling sessions.

Literature Review and Synthesis

A combination of genetic and lifestyle factors affect the development of T2D (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2016). Regarding the pathophysiology, insulin resistance increases as beta cell destruction occurs during the pre-diabetic years, significantly impacting the body's insulin needs over time leading to progression of T2D (NIDDK, 2016). Type II diabetes is largely the result of excess body weight, inappropriate food choices, and physical inactivity (WHO, 2016). Moreover, people who are obese are 20 times more likely to be diabetic compared to those with a normal weight, thus making dietary modifications an even more crucial part of lifestyle interventions (Mukonka et al., 2016). Over time, diabetes can damage the heart, blood vessels, eyes, kidneys, nerves, and other major organ systems (WHO, 2016). Common consequences of diabetes include a 2-3-fold increased risk of heart attack and stroke; neuropathy in the lower extremities, which increases the

chance of foot ulcers, infection and eventual need for limb amputation; diabetic retinopathy potentially leading to blindness; and chronic kidney disease that can progress to complete renal failure (WHO, 2016). Emerging evidence also indicates that T2D is associated with more comorbidities than originally thought, including cognitive impairment, urinary incontinence, fracture risk, and the development of cancer (Healthy People 2020, 2016). While the rates and complexities of T2D continue to increase, few people receive effective preventative care, which makes diabetes an immense and complex public health concern (Healthy People 2020, 2016). Dietary modification has been proposed as the cornerstone of T2D management in many studies, and is usually recommended as the first step in treatment (Cook, Nasser, Comfort, & Larsen, 2006; Gaetke, Stuart, & Trusczyzyska, 2006; Halali, Mahdavi, Mobasser, Asghari Jafarabadi, & Karimi Avval, 2016; Lim, Park, Choi, Huh, & Kim, 2009; Vijan et al., 2004).

The Diabetes Prevention Program (DPP) supports lifestyle interventions to help reduce the prevalence of T2D and obesity, which can contribute to diabetes (NIDDK, n.d.). The results from the DPP study indicated that participants in the lifestyle intervention group who received intensive counseling and motivational support on effective diet, exercise, and behavioral modification reduced their risk of developing diabetes by 58% (NIDDK, n.d.). Thus, lifestyle interventions, such as weight management, physical activity, nutritional changes, maintaining a normal body weight, and avoiding tobacco products can improve insulin resistance, help preserve beta cell function, and consequently, slow or halt the development of T2D (NIDDK, 2016; WHO, 2016). Additionally, diabetes interventions involving nutrition therapy provided by RDs have proven efficacious for improving a range of outcomes in T2D, including a decrease in HbA1c values by 0.5-2% (ADA, 2017; European Federation of the Associations of Dietitians [EFAD], 2012). Dietary counseling provided by a dietitian has also been shown to be cost-

effective, given that the total costs of diabetes in the United States in 2012 was \$245 billion (ADA, 2016; EFAD, 2012).

Dietitians focus on coping skills such as stress management and utilization of social support, which is important since stress decreases the ability to adhere to lifestyle recommendations (Mukonka et al., 2016; Uchenna et al., 2010). Group education and care, delivered by RDs, is associated with a significant reduction in HbA1c, decreased insulin resistance and a better quality of life (Trento et al., 2008). Consequently, the injurious effects of hyperglycemia, such as microvascular (diabetic nephropathy, neuropathy, and retinopathy) and macrovascular (coronary artery disease, peripheral arterial disease, and stroke) complications can perhaps be prevented (ADA, 2008). Identifying factors that lead to dietary nonadherence will result in more efficient and effective ways of enhancing patients' conformity to recommendations, as well as improvement of health outcomes for patients with T2D (Uchenna et al., 2010).

Databases, Keywords, Selection Criteria, and Limits

In performing a literature search related to this topic, a number of relevant articles were located. Databases used to provide high quality research on this topic included MEDLINE, PubMed, CINAHL, ProQuest, Cochrane Library, Clinical Key, and Google Scholar. Keywords consisted of *dietitian*, *nutritionist*, *dietary counseling*, *dietary education*, *nutrition therapy*, *barriers*, *perceptions*, *perceived benefits*, *adherence*, *patient compliance*, *diabetes mellitus*, and *type II diabetes*. Inclusion criteria for the literature review included peer reviewed, primary journal articles, including randomized controlled trials (RCT) and systematic reviews. Articles were excluded if they did not relate to health care, included populations younger than 18 years of age, and were of a non-English language. Referenced and cited sources within articles relating

to the topic were also reviewed for potential resources. EndNote was used to accumulate and organize the collected studies. The ADA, WHO, EFAD, NIDDK, Institute for Healthcare Improvement (IHI), and the United States Department of Health and Human Services (USDHHS) were utilized for current statistics, guidelines, and recommendations related to T2D. After applying the aforementioned keywords and limitations, 18 articles remained to conduct the literature synthesis. All relevant articles were critically appraised and synthesized.

Critique

Study designs. Eighteen studies were relevant to the topic chosen and were used for the literature review and synthesis, eight of which related to patients' perceptions, and ten related to barriers for adherence. Six of the articles were qualitative descriptive designs (Ball et al., 2016; Endevelt & Gesser-Edelsburg, 2014; Foley & BeLue, 2016; Johnson et al., 2014; Malpass, Andrews, & Turner, 2009; Vijan et al., 2004). Five were observational cross-sectional studies (George et al., 2016; Halali et al., 2016; Kavookjian et al., 2005; Mukonka et al., 2016; Uchenna et al., 2010). The remaining articles included two RCTs (Adolfsson, Walker-Engstrom, Smide, & Wikblad, 2007; Brekke, Sunesson, Axelsen, & Lenner, 2004), a retrospective analysis (Gaetke et al., 2006), investigational studies (Albarran, Ballesteros, Morales, & Ortega, 2006; Cook et al., 2006; Lim et al., 2009), and prospective descriptive designs (Lemon et al., 2004; Serour, Alqhenaei, Al-Saqabi, Mustafa, & Ben-Nakhi, 2007).

Study Populations. The studies collected in the literature search varied in geographical location as well as race and ethnicity to indicate the global significance of diabetes and that perceptions and barriers might vary according to country, setting, and religious/cultural beliefs. The Johnson et al. (2014) study took place in Maryland and assessed African-Americans. The study by Kavookjian et al. (2005) included participants from four different clinical sites in the

Southern states of West Virginia, Alabama, and Kentucky. The study by Vijan et al. (2004) was conducted in Ann Arbor and Detroit, Michigan. The remaining articles took place in various locations around the world including Africa (Foley & BeLue, 2016; Mukonka et al., 2016), Sweden (Adolfsson et al., 2007; Brekke et al., 2004), Kuwait (Serour et al., 2007), England (Malpass et al., 2009), Canada (Cook et al., 2006), Korea (Lim et al., 2009), Nigeria (Uchenna et al., 2010), Mexico (Albarran et al., 2006), India (George et al., 2016), Iran (Halali et al., 2016), and Australia (Ball et al., 2016). The studies by Gaetke, Stuart, and Trusczyzyska (2006) and Lemon et al. (2004) did not disclose demographic information on their study population.

Limitations. Recall bias was present in the Brekke, Sunesson, Axelsen, and Lenner (2004) article. Small sample size was a limitation in several studies (Adolfsson et al., 2007; Gaetke et al., 2006; George et al., 2016; Johnson et al., 2014; Lemon et al., 2004). Self-reported data was subject to bias due to the potential of certain groups being underrepresented, and was present in two of the studies (Halali et al., 2016; Johnson et al., 2014). Low socio-economic level was a recurring outcome, suggesting that the findings in relation to income level are most likely higher than an overall population average (Asghari Jafarabadi et al., 2016; Halali et al., 2006; Mukonka et al., 2016; & Vijan et al., 2004). Johnson et al. (2014) did not assess the health literacy of the participants in their study. Using only one clinical site was a limitation in the Mukonka et al. (2016) study. In contrast, Kavookjian et al. (2005) included a sample of four different data collection sites, exposing the analysis to many potential sources of extraneous variance, which could have distorted the results. The study by Serour, Alqhenaei, Al-Saqabi, Mustafa, and Ben-Nakhi (2007) was conducted in only six family practice health centers out of 74 in Kuwait. Recruitment bias was present in the Vijan et al. (2004) study since they used fliers and offered a financial incentive to patients. Several participants declined participation, which

resulted in lower statistical power than planned in the Adolfsson, Walker-Engstrom, Smide, and Wikblad (2007) study. The studies by Albarran, Ballesteros, Morales, & Ortega, (2006), Johnson et al. (2004), and Vijan et al. (2004) assessed specific populations, and therefore, may not be representative of all patients and may limit the generalizability of the results. Attrition rate was a limitation in the Cook, Nasser, Comfort, and Larsen (2006) and the Vijan et al. (2004) studies, as many participants did not complete all questionnaires.

Strengths. In contrary to the limitations, some strengths were evident. The Johnson et al. (2014) study is among the first to report detailed views about the role of dietary interventions in chronic kidney disease (CKD) prevention among African Americans at high risk for CKD, suggesting that their findings may inform future studies of vulnerable populations. The measures used in the Kavookjian et al. (2005) study were validated and showed internal consistency. A large sample size was used in the Uchenna et al. (2010) study. The study by Malpass, Andrews, and Turner (2009) used a single researcher, which helped to ensure consistency across the interviews and enabled the researcher to develop an overall understanding of the data set.

Role of RDs and dietary counseling in health promotion and disease prevention.

Education for people with diabetes has evolved over the last few decades. In the 1980s, PCPs acted as experts and had full responsibility for patients' care (Adolfsson et al., 2007). The new role for providers began to shift in the 1990's to that of a facilitator, thus coaching and supporting patients with diabetes (Adolfsson et al., 2007). In more recent years, the role for providers remains relatively the same while other members of the multidisciplinary team, such as dietitians, have surfaced and are fully equipped and able to provide nutritional expertise on a wide array of numerous medical conditions (Adolfsson et al., 2007). Registered dietitians are recognized by the ADA as the most qualified healthcare team members to provide dietary

counseling for persons with diabetes, as well as other chronic conditions (Gaetke et al., 2006). Moreover, patients with T2D believe the ideal person(s) to educate people about recommended dietary changes include doctors, nutritionists, dietitians and social workers (Johnson et al., 2014). To further support this, clients in the Cook et al. (2006) study reported that the RD was knowledgeable on the topic of T2D, provided useful information, and tailored advice to their needs. Patients also believed that the RD was supportive, encouraging, and caring during their counseling session (Cook et al., 2006). This study promotes the positive impact that dietitians can have on patients.

Efforts aimed at health promotion and disease prevention are imperative for delaying premature death, improving quality of life, and lessening the economic burden on the health care system (Gaetke et al., 2006). As previously stated, dietary modification has been proposed as the cornerstone of T2D management in many studies, and is usually recommended as the first step, but is also considered the most difficult aspect of diabetes management (Cook et al., 2006; Gaetke et al., 2006; Halali et al., 2016; Lim et al., 2009; Vijan et al., 2004). This is unfortunate, as the potential benefits of dietary changes are limitless including weight loss through proper diet and exercise results in improved glycemic control, and reductions in cardiovascular risk and overall mortality (Vijan et al., 2004). Dietary modification is particularly crucial in many locations outside of the U.S. since drug therapy is often expensive and widely unavailable (Foley & BeLue, 2016; Johnson et al., 2014). However, some of the recommendations typically endorsed in the diabetic diet may not align with the cultural views of some populations (Foley & BeLue, 2016). Additionally, there are perceptions among some inhabitants that healthful eating requires giving up part of their cultural heritage (Johnson et al., 2014).

Dietitians contribute greatly to comprehensive care plans for patients with T2D who, as a result of dietary counseling, have improved their anthropometric measures, use less prescribed medication, and have significantly greater intermediate and long-term improvement in glycemic control (Gaetke et al., 2006; Lim et al., 2009). Additionally, they provide patients with thorough education on carbohydrate counting; label reading; the relationship of food, medication, exercise, and blood glucose; activity and exercise; weight control; and low-fat diet principles (Gaetke et al., 2006). Other topics typically discussed during dietary counseling include smoking cessation, portion control, individualized menus, and glycemic management during illnesses (Gaetke et al., 2006).

Dietitians also have an essential role in evaluating barriers to healthy eating, such as the cost of healthy food and stress-related eating, and can assist patients in working toward solutions to facilitate behavioral change (Johnson et al., 2014). Patients with T2D expressed the need for good personal treatment, effective communication and time availability, psychological support, doubt elucidation with respect to food consumption, and knowledge about disease-related symptoms, all of which can be addressed during dietary counseling with the RD (Albarran et al., 2006). These are important concepts because satisfaction with care has been positively associated with treatment compliance (Cook et al., 2006). The overall aim of dietary counseling is to help patients better manage their condition and learn how to balance diabetes in their daily life so as to prevent the development of secondary complications of the disease and improve health outcomes (Adolfsson et al., 2007; Cook et al., 2006). Therefore, the role of a dietitian should not be undervalued, as it is the basis to prevent disease and promote health.

Clients' Perceptions about Nutrition Counseling Instrument. In 1994, the Clients' Perceptions about Nutrition Counselling (CPNC) instrument was developed to examine whether

dietary counseling made a difference to a client's psychosocial and physical well-being (Cook et al., 2006). The Cook et al. (2006) study found that, even without an improvement in physical condition, clients appreciated that the dietitian cared to find solutions to their dietary problems. A total of 164 patients completed the CPNC instrument after receiving dietary counseling. The majority of respondents indicated that the RD was knowledgeable (94%) and provided useful information (93%). After receiving dietary counseling, participants knew what to eat (81%) and were able to change their diets accordingly (70%). Additionally, participants felt that the dietitian provided support and encouragement (86%) and cared about them (83%). A large percentage of participants (91) determined that anyone with diabetes should talk with a dietitian. Only 13% of patients indicated that they were unable to change their diet after meeting with the RD, with the most common reasons cited as not knowing what to eat (6%), problems preparing meals (3%), and difficulty finding the recommended food items (2%). Lastly, patients agreed that their condition improved after changing their diet.

Barriers to Adherence with Dietary Counseling. Despite the importance of dietary modification in T2D management, the rate of adherence to dietary recommendations tends to be low among individuals in both developed and developing countries (Halali et al., 2016). Therefore, it is important to identify and explore both modifications that are likely to be implemented and those which patients are likely to disregard. Barriers might differ depending on where the individual resides; beliefs according to culture, religion, or ethnicity; behavior and motivation towards change; financial situations; and the availability of a support system (Brekke et al., 2004). Many factors play a part in explaining why individuals may not adhere to dietary recommendations, and reasons for non-adherence are not always due to the individual's choices,

but are often times due to reasons outside the individual's control. Many of these reasons will now be discussed.

Forgetfulness of dietary recommendations or failure to adjust to dietary changes were barriers in the Brekke et al. (2004) and Mukonka et al. (2016) studies, consequently causing patients to revert to old nutritional habits. Lack of ideas for cooking and not wanting to prepare meals in advance were other barriers (Brekke et al., 2004; Kavookjian et al., 2005).

Additionally, family members' views often affect patient compliance. Lack of support or having to eat an entirely separate meal than the rest of the family will likely result in unsuccessful adherence (Brekke et al., 2004; Foley & BeLue, 2016; Halali et al., 2016; Johnson et al., 2014; Kavookjian et al., 2005; Mukonka et al., 2016; Serour et al., 2007; Uchenna et al., 2010; Vijan et al., 2004). It has been shown that families that participate together in meal planning and preparation facilitate understanding and healthier dietary habits as a whole, suggesting that dietary counseling should involve the entire family in order to optimize adherence (Brekke et al., 2004; Halali et al., 2016). Households with multiple individuals who have T2D have been shown to facilitate better adherence to the dietary recommendations (Foley & BeLue, 2016).

Cost of food was listed as a major barrier in nearly all of the studies (Brekke et al., 2004; Foley & BeLue, 2016; Halali et al., 2016; Johnson et al., 2014; Kavookjian et al., 2005; Mukonka et al., 2016; Uchenna et al., 2010; Vijan et al., 2004). Participants in the Foley and BeLue (2016) study reported difficulty adhering to their therapeutic diet between paychecks when they have little to no income, consequently resulting in poorly managed diabetes. In several of the studies, unhealthy dietary practices have been a lifelong habit for patients, making it difficult to adopt new dietary habits (Johnson et al., 2014; Kavookjian et al., 2005). The

inability to resist temptations of unhealthy foods was a barrier in three of the studies (Halali et al., 2016; Mukonka et al., 2016; and Uchenna et al., 2010).

Emotional behaviors, such as stress-related eating or helplessness, are often prevalent in patients with T2D and can ultimately affect their regimen adherence (Halali et al., 2016; Mukonka et al., 2016; Serour et al., 2007; Uchenna et al., 2010; Vijan et al., 2004). Further emotional behaviors, such as confusion and frustration, were also reported as barriers to dietary adherence (Halali et al., 2016; Uchenna et al., 2010; Vijan et al., 2004). Patients reported not knowing what or how much to eat, or which foods belonged to which of the food groups in the Halali et al. (2016) study.

Small recommended portion size was an additional barrier that resulted in patients feeling hungry sooner (Halali et al., 2016; Kavookjian et al., 2005; Mukonka et al., 2016; and Vijan et al., 2004). Preparation time, or lack thereof, can be a major barrier, particularly for those who have irregular or strict work hours (Brekke et al., 2004; Halali et al., 2016; Serour et al., 2007; and Vijan et al., 2004). A barrier that was mentioned in six of the studies was attending family gatherings or social events where the recommended foods were not an option (Johnson et al., 2014; Kavookjian et al., 2005; Mukonka et al., 2016; Serour et al., 2007; Uchenna et al., 2010; Vijan et al., 2004).

Other barriers that were not as prevalent included: certain recommended foods, such as fresh produce, are unavailable in stores (Johnson et al., 2014); unhealthy foods are more convenient to prepare (George et al., 2016; Johnson et al., 2014); cultural beliefs are incompatible with the recommendations (Mukonka et al., 2016; Vijan et al., 2004); dislike of the recommended foods (George et al., 2016; Vijan et al., 2004); and unwillingness to change dietary habits (Serour et al., 2007). Level of education was also a barrier, as those with a higher

level of education were more adherent to dietary recommendations (Mukonka et al., 2016; Uchenna et al., 2010).

Number, duration, and type of dietary counseling sessions. The number of dietary counseling sessions varied and included one session (Gaetke et al., 2006; Lim et al., 2009), two sessions (Brekke et al., 2004), three sessions (Johnson et al., 2014), five sessions (Adolfsson et al., 2007; Albarran et al., 2006), six sessions (Vijan et al., 2004), and 15 sessions (Malpass et al., 2009). Dietary counseling was performed in both individual settings (Gaetke et al., 2006; Lemon et al., 2004; Malpass et al., 2009), and group settings (Adolfsson et al., 2007; Albarran et al., 2006; Brekke et al., 2004; Johnson et al., 2014; Lim et al., 2009; Vijan et al., 2004). Sessions lasted approximately 20 minutes (Malpass et al., 2009), 60 minutes (Gaetke et al., 2006), 90 minutes (Brekke et al., 2004; Johnson et al., 2014), 2 hours (Lim et al., 2009; Vijan et al., 2004), 2.5 hours (Adolfsson et al., 2007) and between 2 to 4 hours (Albarran et al., 2006).

Additional Findings of the Studies. At one-year follow-up, patients who received dietary counseling showed significantly higher levels of confidence in diabetes knowledge (Adolfsson et al., 2007; Albarran et al., 2006; Ball et al., 2016; Lemon et al., 2004). A comparison of BMI in patients who attended more than three sessions to those who attended less than three sessions showed no difference between baseline and post-dietary counseling (Albarran et al., 2006). Contrary to what was expected, a significant increase on waist circumference was found in the Albarran et al. (2006) study post-dietary counseling, but a significant decrease was seen in the Lim, Park, Choi, Huh, and Kim (2009) study.

There were no differences in outcomes regardless of whether or not family members attended the sessions in the Albarran et al. (2006) study. Gender did not significantly influence patients' perceptions about nutrition counseling, however, older patients (over age 67.5) were

more in agreement that they did not need to make dietary changes than were clients ages 43.1 to 57.5 (Cook et al., 2006). There were significant decreases in weight (Cook et al., 2006; Gaetke et al., 2006; Lemon et al., 2004; Lim et al., 2009), BMI (Cook et al., 2006; Gaetke et al., 2006; Lemon et al., 2004; Lim et al., 2009), total fat intake (Cook et al., 2006), saturated fat intake (Cook et al., 2006), cholesterol intake (Cook et al., 2006; Gaetke et al., 2006; Lim et al., 2009), and sodium consumption (Cook et al., 2006) post-dietary counseling. Servings of fruits increased significantly from baseline to three months and baseline to six months, whereas servings of fat significantly decreased from baseline to three months and baseline to six months in the Cook et al. (2006) study. However, the absence of a significant increase in the number of servings of vegetables, an important goal for heart health, indicates that not all the desired dietary behaviors were adopted (Cook et al., 2006).

Among patients who received dietary counseling, mean fasting blood glucose and mean HbA1c decreased significantly (Gaetke et al., 2006; Lemon et al., 2004; Lim et al., 2009). Additionally, mean total cholesterol, mean LDL, and mean triglyceride levels all decreased significantly (Gaetke et al., 2006; Lemon et al., 2004; Lim et al., 2009). The studies by Lemon et al. (2004) and Lim et al. (2009) showed significant decreases in systolic blood pressure. Smoking habits did not change over time in the Lemon et al. (2004) study.

From these studies, it has been shown that RDs have experienced significant results in terms of weight loss, serum cholesterol levels, HbA1c values, glucose levels, and hypertension. It can also be gathered that the care provided by RDs results in more effective outcomes for patients with chronic diseases, particularly in comparison to standard care without dietary counseling.

Further Implications. There were two findings from the Vijan et al. (2004) and Foley and BeLue (2016) studies that are noteworthy and deserve attention. First, the results from the survey in the Vijan et al. (2004) study suggests that patients find even moderate dietary modification to be more cumbersome than taking oral agents, and a stricter diet is seen as having a burden similar to that of twice-daily insulin injections. Subsequently, patients were more likely to cooperate with pharmaceutical diabetes management than with self-care behaviors such as dietary modification (Vijan et al., 2004). Second, Foley and BeLue (2016) indicated that individual dietary counseling interventions are not effective in reducing HbA1c values, whereas group-based interventions might prove to be more effective.

Further research is needed in order to elucidate whether different factors applied to the intervention will have added benefits, such as: (1) intensity level of dietary counseling, taking into consideration the health literacy of participants; (2) duration and number of times of intervention; (3) individual versus group dietary counseling; (4) the significance of involving family members or support persons in dietary counseling sessions; (5) factors that affect dietary adherence; and (6) long-term reduced risk of diabetes complications among those who sustain changes adapted from dietary counseling.

Literature summary. All of the studies included in the literature review demonstrate the desirability and effectiveness of dietitians as full participants in the multidisciplinary team for patients with T2D. There is no standard meal plan or eating pattern that works universally for all people with diabetes (Evert et al., 2013). In order to be effective, dietary counseling should focus on the targeted health goals; personal and cultural preferences; health literacy; access to healthful dietary choices; and readiness, willingness, and ability to change (Evert et al., 2013). It should also be noted that the management of T2D is highly dependent on the patient's active

involvement in self-care behaviors, which ultimately affects the way patients perceive things, as well as their adherence to the regimen (Evert et al., 2013).

Theoretical Framework

Pender's health promotion model, a comprehensive behavioral change theory, was chosen as the theoretical framework for this project (see Appendix A). The model was designed by Nola J. Pender to assist HCPs in understanding the major determinants of health behaviors as a basis for behavioral counseling to promote healthy lifestyles (Pender, n.d.). It identifies background factors (i.e. age, race, ethnicity, socioeconomic status, etc.) that influence a patient's health behavior, and in doing so, the HCP can assist the patient in changing the behaviors to achieve a healthy lifestyle. Pender's health promotion model assesses several components that will be applied to this project: 1) perceived benefits of action – perceptions of the positive or reinforcing consequences of undertaking a health behavior; 2) perceived barriers to action – perceptions of the obstacles, hurdles, and personal costs of undertaking a health behavior; and 3) interpersonal and situational influences – perceptions of the specific health behavior being compatible with life, as family members, peers, HCPs, and other outside influences can increase or decrease engagement in health-promoting behavior. These behaviors were included in the survey provided to participants. If committed to, it is anticipated that the behaviors will result in improved health, enhanced functional ability and better quality of life for the patient.

Project Assumptions

The project was based on a number of assumptions.

1. Participants involved in the project will answer the survey questions in an honest manner.

2. The inclusion criteria of the sample are appropriate, and therefore, assures that the participants all have the same diagnoses (i.e. type II diabetes).
3. The subject numbers and diversity among participants will be sufficient to obtain desired data.
4. Participants will have a sincere interest in taking part in the project in order to improve their health.
5. The instrument/tool (survey) used for the project will provide accurate data, and data entry and analysis will be error free.
6. The quality improvement design of this project will provide beneficial and useful information that can be applied for future practice.

Project Method

Project Design and Rationale

This quality improvement project was aimed at providing additional diabetic services to the patients at Silver City Health Clinic (SCHC). SCHC is an underserved urban clinic in Kansas City, Kansas and was chosen for this project because its population includes a wide array of ages, genders, and ethnicities. The clinic offers affordable high-quality primary care and a range of health services to residents of Wyandotte and Johnson counties (SCHC, n.d.). Additionally, it provides care to individuals without insurance, as well as those with government or private health insurance coverage (SCHC, n.d.). According to SCHC's statistics, 235 (23%) of the patients seen in 2016 had a diagnosis of T2D. The age of these patients ranged from 20 to 81, with an average age of 53. Of those 235 with T2D, 152 (65%) were Hispanic, 62 (26%) were non-Hispanic Caucasian, 19 (8%) were African-American, and 1 (1%) was Asian.

The project population consisted of adults who attended and received healthcare at SCHC and had an established diagnosis of T2D. According to the ADA's guidelines for the diagnosis of diabetes, patients must meet at least one of the following criteria: (1) fasting plasma glucose \geq 126 mg/dL; (2) 2-hour plasma glucose \geq 200 mg/dL during an oral glucose tolerance test; (3) HbA1c \geq 6.5%; or (4) a random plasma glucose \geq 200 mg/dL in a patient with classic symptoms of hyperglycemia or hyperglycemic crisis (ADA, 2017). The project population met at least one of these criteria, as documented by their PCP at SCHC.

Human Subjects Protection

Institutional review board (IRB) approval was obtained prior to project commencement (see Appendix B). Human subjects' protection was adhered to, no charts were accessed, no personal identifiers were used, and the information obtained from the surveys remained confidential throughout the project. This adheres to the ethical principles presented in the Belmont Report, which is the obligation to do no harm, and to maximize benefits and minimize harm to human subjects (USDHHS, 2016).

A recruitment letter for participants was handed out at the beginning of each dietary session to every individual in attendance (see Appendix C). Additionally, the project leader briefly explained the project and that completion of the survey was purely voluntary and no personal health information was to be used. For those who agreed to participate, they simply completed the survey at the end of the dietary session(s). No form of compensation was provided for participants, and no additional funding was necessary. However, snacks were voluntarily provided by the project leader during one of the sessions (see Appendix D).

Project Sample and Selection Process

Project participants were collected from a convenience sample of patients who met the following inclusion criteria:

- Adults age 18 and older who have type II diabetes;
- HbA1c \geq 9%
- All race and ethnicities;
- Any birth sex;
- Attendance of at least one group dietary counseling session.

Exclusion criteria included these items:

- Patients age 17 and younger;
- Those who were pregnant;
- Those who did not understand or speak English (since the sessions were only conducted in English);
- Any other form of diabetes (prediabetes, type I, gestational diabetes, etc.)

All patients who met the above criteria were recruited for the project. The original aim for the sample size was a minimum of 20 participants.

Data Collection Methods

SCHC employs a registered dietitian and a registered nurse who holds a master's degree in patient education, both of whom graciously agreed to assist with this QI project. It was discussed and agreed upon that due to the unique dynamics and characteristics of the population SCHC serves, group dietary counseling would be a better choice over individual dietary counseling, with intentions of providing a greater turn-out and larger sample size. Although there is a high rate of Hispanic/Latino clientele that attend SCHC, for the purpose of this project, all sessions were conducted in the English language, and therefore, excluded those who did not understand or speak English.

Participants who met the inclusion criteria were recruited by means of their scheduled office visits at SCHC, where their providers discussed the details of the group dietary sessions

with them. Patients were also encouraged to bring their family members and/or support persons with them to the group dietary sessions. A flier was created by the project leader that displayed the dates, times, and additional details of the sessions, and was then handed out by the SCHC providers at appointments, mailed to eligible participants who attended SCHC, and displayed at various public facilities throughout the community (see Appendix E). Additionally, the clinic manager at SCHC called eligible participants on a weekly basis as a reminder of the date and time of the next session and to encourage their attendance.

Instrument and Procedure. (See Appendix F). The post-dietary counseling survey used in this project was adapted from an instrument known as the Clients' Perceptions about Nutrition Counseling (CPNC), which was discussed in a previous section. The purpose of this instrument is to identify the objectives previously listed: measure respondents' perceptions about the effectiveness or value of dietary counseling; assess whether patients believe dietary changes will occur after counseling and the perceived benefits of any such changes; and identify the barriers faced in adhering to the dietitian's recommendations. This instrument was pilot-tested by an expert panel comprised of 33 individuals in a study by Hauchecorne, Barr, and Sork (1994). The expert panel concluded that the instrument was a useful evaluation tool for nutrition and dietetics, as it provided information about patients' perceptions of what they liked or disliked about their contact with a dietitian, as well as assessed patients' abilities to make dietary changes after counseling. Additionally, instrument reliability was evaluated by a panel of five dietitians and one medical social worker, who reviewed each stage, serving as a check on data analysis and allowing for input into, and approval of, plans for the next stage. Instrument reliability was evaluated by comparing the initial and 1-week results in a sample of 18 individuals who returned two usable copies of the instrument. Test-retest correlations averaged 0.65 (range = .28 to .84),

leading to the revised and final instrument. The Hauchecorne, Barr, and Sork (1994) study also provided clinical guidelines that clearly delineates the intended uses, target respondents, steps to follow for use or modification of the instrument, and tabulation instructions on calculating the collected data. The instrument was developed as a means of obtaining information to guide dietetics practice and ultimately help demonstrate its effectiveness in the clinical setting. Furthermore, the study indicated that the instrument may also help to convince administrators of the value of dietitians' services.

Dietary Sessions

A total of eight group sessions were offered every Monday during the months of June and July in 2017, starting June 5 and ending July 24, with the exception of July 3 due to the holiday weekend. All sessions were free to attend, lasted from 1-3 pm, and were held at the South Branch Argentine library located just a block north of SCHC, approximately 0.1 miles away and within walking distance. The content, material, and education used in the dietary sessions were determined by the RD and RN who conducted the sessions. The project leader attended all of the counseling sessions and was able to observe the interactions between the RD, RN, and participants, while assessing the verbal and written educational material provided, and attempting to understand the patient's feelings and thoughts throughout the process.

The dietary sessions presented material on different diabetes-related topics each week that had been previously discussed and decided upon by the RD and RN. Typically, the first hour covered new material, and the second hour reviewed former material that had been discussed at previous sessions. While it was not the intent, because the sample size was small with only four participants, one-on-one time was spent with the participants, giving the RD and RN the opportunity to provide customized counseling. Sessions concluded a brief review of

what was covered during the session, questions from participants, and what topics would be covered at the next session. Listed below is a summary of the eight sessions individually.

Session 1 – June 5, 2017. The session began with getting to know the participants. The pathophysiology of diabetes and its effects on various organs such as the pancreas, liver, kidneys, etc. was discussed, along with the differentiation between type I and type II diabetes. Create Your Plate by the ADA was introduced – 50% non-starchy vegetables, 25% grains and starchy foods, and 25% protein. Participants were instructed on how to read food labels, and to bring some of their food labels from home with them to the next session. There was also a discussion on which nutrients to look for on labels and limit, including saturated and trans fat, cholesterol, and sodium. Carb counting was a major topic – equating 15 grams of carbs to one carb serving, with no more than three servings of carbs per meal, and a total of nine carb servings per day. The seven self-care behaviors recommended by the American Association of Diabetes Educators concluded this session.

Session 2 – June 12, 2017. Examples of carbohydrate servings in every-day foods and beverages were displayed. Participants shared their HbA1c values, and a discussion was held on what the value means and how it can be improved. The RD and RN mentioned the best times of the day to check glucose levels including fasting, two hours after a meal, and when symptomatic for hypo/hyperglycemic. Target fasting glucose (80-130), post-prandial glucose (80-180), and bedtime glucose (110-150) were also discussed.

Session 3 – June 19, 2017. Two pharmacy students joined the session and the majority of the session revolved around pharmacotherapy, particularly antihyperglycemics, insulin, and their mechanisms of action. Participants were also instructed on proper foot care. The session ended with a demonstration on simple range of motion and stretching exercises that can be

performed while sitting in a chair. The purpose was to demonstrate to the participants that they can still be active even if they are not wanting to perform physical activity. This was done for the two participants, one of whom reported being on disability due to certain mobility restrictions, and the other voiced that she had no desire to exercise.

Session 4 – June 26, 2017. Several sample meal plans were nicely detailed listing food items belonging to the various food groups of carbohydrates, sugars, starches, non-starches, fats, and protein. A list of snacks that can quickly raise blood glucose including fruit juice, soda, milk, hard candy, honey or sugar, and glucose tablets was provided. The 15-15 rule was discussed, which applies if you have a glucose reading less than 70, and involves eating 15 grams of carbs, waiting 15 minutes before rechecking the glucose level, if still 70 or below eat an additional 15 grams of carbs, wait another 15 minutes and recheck the glucose level again. Weight loss was the last topic addressed during this session, and food diaries were encouraged.

Session 5 – July 10, 2017. Patients were asked to bring their food diaries with them which were then reviewed one-on-one with the RD, RN, and the project leader. Due to the fact that two of the four participants smoked cigarettes, smoking cessation was paid particular attention to and how it affects all health outcomes, including diabetes. Other topics addressed included symptoms of hyper/hypoglycemia, how to manage diabetes while ill, and how exercise affects glucose levels. A list of affordable fitness classes in the Kansas City area was given to all participants that included activities such as Zumba, boot camp, yoga, and Pilates, and were either free or one dollar to attend.

Session 6 – July 17, 2017. This session focused on diabetes-related conditions – target blood pressure, target cholesterol, and target amount of exercise. Eating every 4-5 hours during wake time to prevent excessive hunger and overeating at mealtime was encouraged. Alternatives

to certain foods were discussed, such as brown rice in place of white rice, baked apple slices with cinnamon rather than apple pie, and sparkling/flavored water instead of soda. Participants were also counseled on consuming enough dietary fiber and foods high in fiber content. A list of phone apps and websites that help track carbs, calories, and exercise were provided.

Session 7 – July 24, 2017. Tips and tricks to healthy eating were mentioned – using herbs, spices, lemon juice, and low-fat dressing to add flavor; fill up on fiber and water; shop, cook, and eat with those who support healthy eating habits; foods to limit, such as candy, cookies, ice cream, processed snack foods, butter/margarine, fried foods, lard/shortening, whole milk, full-fat cheese, and fatty/processed meat (bacon, bologna, salami, etc.). The RD and RN discussed ways to cope with challenges and obstacles to eating healthier – use coupons, buy in bulk, buy items on sale, grow your own garden, stick to the items on the list, look for recipes for fast yet healthy meals, and crockpot recipes that are easy and can be quickly prepared.

Session 8 – July 31, 2017. Because only one participant attended this session, it was very customized to that individual and what they desired to talk about. We were able to review his medical history, medications he was taking, his food diary, and provide education on two of his biggest concerns – portion control and healthy food options that are appealing.

Findings/Results

Sample and demographics. Certain demographics were acquired via the survey, and included birth sex, age, race/origin/ethnicity, and highest level of education. An additional question inquired as to how long ago the participant was first diagnosed with T2D. Data collection occurred over the eight-week period at each of the sessions, from June 5 through July 31 (see Appendix G for timeline). The sample size included a total of four participants, three of which were female and one male. Seventy-five percent of the sample fell under the age category

of 50-59, with the remaining 25 percent in the 40-49 age category. Two of the four participants were Caucasian, one was African-American, and one categorized themselves as “other.”

Participants varied in regards to education level: 25 percent attended some high school, 25 percent completed high school, 25 percent completed some college, and 25 percent graduated with their associate’s degree. The four participants had lived with T2D for more than three years.

Questions 1-4 of Survey. When asked if this was their first time meeting with a dietitian, 50 percent reported yes and 50 percent reported they had met with one previously. All participants (100%) found the dietary sessions to be helpful. Participants reported attending the dietary sessions for the following reasons, which were based on the CPNC instrument: to learn more about various food groups that affect diabetes (75%), to learn how to better manage my diabetes (75%), reassurance that I was eating properly (50%), recommended by my PCP that I see the dietitian (50%), and to receive general dietary advice (25%). Factors that prevented participants from being able to follow the recommendations made in the dietary sessions included: I am worried the recommended portion size is too small and will not satisfy my hunger (75%), lack of time to prepare the recommended foods/unhealthy foods are easier and quicker to prepare (75%), cost of food (50%), I am worried I will crave unhealthy foods/dislike of the recommended foods (50%), access/transportation to the store (25%), my family members will not want to eat some of the things recommended/lack of support (25%), it will be hard to change my eating habits (25%), I have an irregular work schedule (25%), the recommended foods are often not available at social events/family gatherings (25%). Participants did not find the following factors to be barriers: the recommended foods do not match with my cultural/belief system, I will forget the types of food that were recommended, I am worried I will eat unhealthy

food when I am stressed/emotional, and it will be hard to find the recommended foods at the store.

Question 5. Question 5 included 13 items that used a 5-point Likert scale to assess the participants' levels of agreement or disagreement in regards to the information they were provided throughout the dietary session and whether they found it to be helpful to them. Many of these items were based on the CPNC instrument. Due to the varying degrees of responses, the 13 items are individually displayed in bar graph format for easier observation of each question and answer (see Appendix H for data tables). In summary, all participants found the information provided by the dietitian to be useful, and the dietitian provided support and encouragement, and cared about them and their disease. Additionally, 100% of the sample felt that the dietary advice was suited to meet their needs and they now know the types of food to eat to help manage their diabetes. Seventy-five percent felt that by applying some of the dietary recommendations to their diet, their diabetes will improve. Unfortunately, only one participant (25%) agreed that after one session, they felt in control of their diabetes. This particular question may have revealed better results had the question been asked again at the conclusion of the last dietary session during the eighth week after participants had received further education. In contrast, 75% of participants replied that anyone with diabetes should meet with a dietitian, and 100% disagreed with the statement that there was no benefit in attending this session.

Question 6 – suggestions for future dietary counseling. The last question on the survey was an open-ended question asking participants to provide any additional comments or suggestions for the dietary session(s) they attended and the information and education they were given. One participant answered, “The dietary sessions helped me learn more about diabetes,”

while another wrote, “The sessions walked me down the paths of both the good and bad of diabetes.”

Discussion

The project aims were to learn the perceptions patients with T2D have after receiving dietary education, as well as discern the barriers that prevent them from adhering to the education and dietary recommendations they receive. The overall findings from this project indicate that individuals with T2D found benefit from attending dietary sessions.

Perceptions. All participants agreed or strongly agreed that the information the dietitian provided during the dietary sessions was useful and was suited to meet their individual needs. This aligned with the results reported by Cook et al. (2006) who found that clients reported that the dietitian was knowledgeable on the topic of T2D, provided useful information, and tailored advice to their needs. Three out of four participants also believed that applying the dietary education they received to make even minor changes to their dietary habits will lead to improvement of their diabetes. Multiple national organizations including the ADA (2017), NIDDK (2017), NIH (2017), WHO (2015), USDA (2010), and USDHHS (2010) support the role of dietary education in improving outcomes, and suggest that choosing a healthy eating pattern contributes to achieving and maintaining a healthy weight and can prevent serious health problems such as diabetes, obesity, and heart disease. Lastly, nearly all participants agreed that they had a better understanding of how to manage their diabetes after attending the dietary session(s). This finding is similar to Adolfsson et al. (2007) and Cook et al. (2006) findings that dietary counseling can help patients better manage their condition and learn how to balance diabetes in their daily life so as to prevent the development of secondary complications and improve health outcomes.

Barriers. While the barriers preventing participants from adhering to the dietitian's recommendations varied, several recurring themes were apparent. Cost of food, lack of time to prepare the recommended foods/unhealthy foods are easier and quicker to prepare, and the recommended portion size is too small and will not satisfy my hunger were among the most common themes chosen by participants. These findings relate to those in a study by Marcy, Britton, and Harrison (2011) which found that participants chose cost as an important factor in food selection with a mean score of 3.94 out of 5. Furthermore, barriers that the majority of respondents agreed or strongly agreed were important included: stress causing over-eating or unhealthy food choices, difficulty resisting the temptation to eat unhealthy food, and healthy food being too expensive (Marcy, Britton, & Harrison, 2011). Nonetheless, the common barriers listed by participants in this project were addressed by the RD and RN during the sessions. Recommendations they provided for the cost of food included adhering to the food items on their shopping list, avoid being wasteful/eat leftovers, buy canned or frozen fruit and vegetables to prevent spoilage, buy generic and cheaper brands, and cutting down on the non-essential items like chips, soda, and other treats. For lack of time to prepare the foods, advice was given to prepare meals ahead of time and freeze them or make a quick crockpot meal. In regards to portion size being too small, portion control using *MyPlate* was thoroughly discussed at several sessions (see *Figure 1*). Participants were each given a booklet created by the ADA that listed examples of foods belonging to the different food categories (nonstarchy vegetables, starchy vegetables, grains, fruit, dairy, and protein) (see *Figure 2*). The booklet showed a plate sectioned off with carrots and green beans (nonstarchy vegetables) on one half of the plate, roasted potatoes (starchy vegetables) on a quarter, and a chicken breast (protein) in the other quarter, with a side of yogurt (dairy) with raspberries and blackberries (fruit), and a cup of water with

lemon see *Figure 2*). The plate was colorful, enticing, and a prime example of how you can eat tasteful good food while still maintaining portion control and adhering to healthy food options.

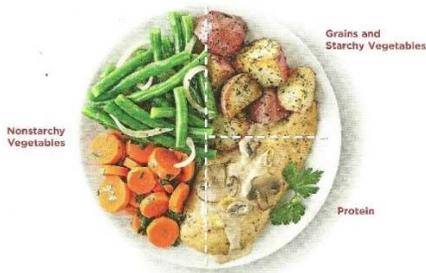
Healthy Eating

Create Your Plate

If you have diabetes, what you eat is important. Eating well can help you manage your blood glucose (blood sugar), blood pressure, and cholesterol. If you are overweight, eating the right portions can help you lose weight—or at least stop you from gaining more.

People with diabetes can eat foods from all of the important food groups: grains and breads, fruits, vegetables, meats and meat substitutes, and dairy. These foods give you the nutrition you need. People without diabetes should also eat this way.

A quick way to plan healthy meals is to “create your plate” with the right portions (how much you eat):



1. Fill 1/2 of your plate with nonstarchy vegetables.
2. Fill 1/4 of your plate with protein.
3. Fill 1/4 of your plate with grains or starchy vegetables. Add one serving of fruit and/or milk/yogurt, as your meal plan allows.
4. Add water or a no-calorie beverage.

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Figure 1. MyPlate.

Create Your Plate!

- 1 Imagine drawing a line across the middle of a 9-inch plate. Then draw another line from the top to the middle. You will have three sections on your plate.
- 2 Fill the largest section with nonstarchy vegetables.
- 3 In one of the smaller sections, put starchy foods, such as noodles, rice, corn, beans, and potatoes.
- 4 The other small section is for protein foods, such as fish, chicken, eggs, tofu, and lean meat.
- 5 Fruit, milk or yogurt can be included as your meal plan allows.
- 6 Choose healthy fats in small amounts. For cooking, use oils. For salads, nuts, seeds, avocados, and vinaigrettes are healthy choices.
- 7 To complete your meal, add a low-calorie drink like water, unsweetened tea, or coffee.

Water
Coffee
Unsweetened Tea

1/2 cup raspberries + blueberries = 1 carb
1/2 banana = 1 carb

Fruit - carb = 15gms
• fresh, frozen, or canned in juice or light syrup
• peach, pineapple, banana, apple, pear, mango, grapes, berries, melon, papaya, apricot, orange, grapefruit

Dairy - carb = 12gms + 8gms protein
• fat-free, skim or 1% milk
• low-fat or non-fat yogurt
• plain soy milk

• fresh yogurt, best type of yogurt
• 1 cup strawberries, cantaloupe, honeydew + watermelon = 1 carb

Nonstarchy Vegetables

- fresh, frozen, or canned
- artichoke
- asparagus
- beets
- bok choy
- broccoli
- cabbage
- carrots
- cauliflower
- cucumber
- eggplant
- green beans
- greens
- kale
- leeks

More Nonstarchy Vegetables

- lettuce
- mushrooms
- okra
- onion
- parsley
- peppers
- radishes
- salsa
- sauerkraut
- spinach
- summer squash
- swiss chard
- tomatoes
- turnips
- vegetable juice
- zucchini

Grains and Starchy Vegetables

- whole grain breads, where “whole” is the first ingredient, such as whole wheat, whole oats, etc.
- whole grain, high fiber cereal
- cooked cereal, such as oatmeal, grits, hominy, or cream of wheat
- brown rice, whole grain pasta, barley, whole grain tortillas and whole grain ramen
- cooked beans and peas, such as arbo beans or black-eyed peas, lentils
- potatoes, green peas, corn, lima beans, sweet potatoes, winter squash
- whole grain crackers and fat-free popcorn

Protein

- chicken or turkey (without the skin)
- fish, such as tuna, salmon, cod, or catfish
- other seafood, such as shrimp, clams, oysters, crab, or mussels
- lean beef and pork, such as loin cuts
- tofu, eggs, lower-fat cheese

1 egg/day is recommended

1/2 cup cooked = 1 portion
1 cup raw = 1 portion
3 portions of veggies = 1 carb

Figure 2. Examples of food categories.

General discussion on findings. It was evident throughout this project that T2D is largely the result of excess body weight, inappropriate food choices, and physical inactivity (WHO, 2016). All participants stated during at least one of the sessions that they were either overweight or obese according to their PCP. Participants discussed their BMI and how they have struggled with weight loss for quite some time. Second, one of the reasons participants listed for attending the dietary session(s) was because of the poor food choices they made on a daily basis. One participant described their job as a caregiver as being rather limiting when it comes to food choices for the reason that he/she is already making one meal that needs to be suitable for the individual they are caring for, and it's much easier to eat what has already been fixed than it would be to make an entirely separate meal. Many studies relate to this finding of unsuccessful adherence (Brekke et al., 2004; Foley & BeLue, 2016; Halali et al., 2016; Johnson et al., 2014; Kavookjian et al., 2005; Mukonka et al., 2016; Serour et al., 2007; Uchenna et al., 2010; Vijan et al., 2004). Lastly, only one participant performed 30 minutes of exercise a day at least five days a week as recommended by the ADA. In contrast, the other participants discussed their reasons for not participating in exercise, which included limitations with mobility, difficulty performing exercises due to their weight, and no desire to be active. A study by Booth, Roberts, and Laye (2012) concluded that physical inactivity is a primary cause of most chronic diseases, 35 to be exact, including T2D. In an attempt to combat this, chair and standing exercises were demonstrated, and other low-impact exercises were discussed as exercise options such as walking, yoga, swimming, and weight-training/lifting weights, all of which are recommended by the ADA.

Limitations. There are a number of limitations to this project. While dietary education has proven efficacious for improving a range of outcomes in T2D, including a decrease in

HbA1c values by 0-5-2%, this project did not measure quantitative outcomes (e.g. HbA1c) and only focused on the qualitative measures of perceptions and barriers. Had the project compared participants pre- and post-dietary counseling HbA1c values, results may have further supported the benefit of dietary counseling for T2D if the values were found to have decreased. Another limitation of this project was the constitution of the sample. First, participants were not randomly selected from a larger population. The project was designed only for patients who attended SCHC, and had a diagnosis of T2D with a HbA1c of 9% or greater. This might have biased the sample. Second, the sample was also relatively homogenous with mostly Caucasian participants who lived in a relatively low-income urban community. Additionally, the sessions were conducted only in the English language, and therefore, excluded any individual who did not speak or understand English from participating and attending the sessions, also biasing the sample. This is also a large factor that the RD and RN stated they would take away from this project, and are hopeful that if/when dietary sessions are conducted in the future, they would like to be able to include Spanish-speaking participants as well.

A limitation that relied solely on the participant and their support person(s) was the lack of support persons and/or family members who accompanied the participants. Only one participant was accompanied by a family member with whom he lived, and it was apparent that they had a supportive relationship. This has been shown to optimize adherence to healthier dietary habits (Brekke et al., 2004; Halali et al., 2016). While it did not affect the results of the survey or the project overall, none of the participants attended all of the sessions that were offered. One participant attended only the first two sessions, and another attended only the first three. A third participant was sporadic in her attendance coming to five of the eight sessions, and the last participant began attending with only three sessions remaining, and attended all

three. While this was not the ideal outcome for attendance, it allowed for one-on-one customization with those who did attend, and because the participants were only asked to complete the survey once, it had no effect on the results of the survey. Lastly, the time of day the sessions were offered, from 1-3pm on Mondays, may have interfered with work, school, and other obligations, creating another limitation. Turnout and sample size may have improved if the sessions were held in the evenings after people were off work rather than in the early-to-mid afternoon.

Recommendations

This project found that there is considerable variation regarding the perceptions of and barriers to dietary counseling among individuals with T2D. Thus, the focus should be on what improvements can be made, based on these perceptions and barriers, for dietary counseling provided from here forward. For many individuals with T2D, the most challenging part of the treatment plan is determining what to eat, which is why dietary counseling is indeed imperative to help guide and assist the patient with T2D in making those decisions (Evert et al., 2013). It is also the position of the ADA that there is not a “one-size-fits-all” healthy eating pattern for individuals with T2D, and therefore, dietary counseling should either be customized to the individual (one-on-one), or should include a wide variety of topics and educational material (group setting) (Evert et al., 2013).

The most valuable recommendations that HCPs can take away from this project, which have already been established by the ADA in their Standards of Medical Care in Diabetes statement, include: to address individual nutrition needs based on personal and cultural preferences, health literacy and numeracy, access to healthful food choices, willingness and ability to make behavioral changes, as well as barriers to change (ADA, 2017). When HCPs, in

particular dietitians and those who provide dietary counseling and education, place the focus on incorporating these recommendations into their practice, then the barriers that prevent some individuals from adhering to the dietary recommendations may be overcome, which may, in turn, alter the perceptions of dietary counseling in a positive and reinforcing way.

Implications for Nursing

Only 50% of participants had previously met with a dietitian prior to attending the dietary sessions, despite the fact that all participants had lived with T2D for more than three years. This percentage indicates that, although dietary modification has been proposed as the cornerstone of T2D management and is usually recommended as the first step in treatment, it is not being done (Cook et al., 2006; Gaetke, Stuart, & Trusczyznska, 2006; Halali et al., 2016; Lim et al., 2009; Vijan et al., 2004). This further contributes to the body of knowledge suggesting that early intensive management of T2D, including dietary counseling, is advocated not only to maintain glycaemia and HbA1c at the lowest possible level, but also for an early aggressive management of all known risk factors (Cusack et al., 2008).

Conclusion

Diabetes interventions involving dietitians have proven efficacious for improving a range of outcomes in T2D (EFAD, 2012). By providing ongoing guidance and support, and assisting with making positive lifestyle changes, RDs and other HCPs can help patients with diabetes develop realistic goals that are achievable. Dietary counseling has the potential to be cost-effective and is often a prophylactic measure used prior to starting on medication. Dietary counseling not only considers the physical aspects surrounding food, but also assists with the personal and emotional aspects. Dietitians and other healthcare professionals can help guide and support patients towards finding solutions to problems and barriers they face regarding the

nutritional facets of diabetes.

It is imperative that patients adhere to their dietary recommendations to minimize the burden of the disease on the health systems (Uchenna et al., 2010). There is a need to design strategies to help patients understand their dietary regimens in order to improve their adherence, which will ultimately help in preventing the complications of T2D and decrease the burden of the disease that is already on the increase. An important thing to consider is that the advice given to patients with T2D must be simple, comprehensible, enabling and empowering (Kapur et al., 2008). The care provider, including dietitians, must understand this and mold their advice that supports long-term positive health outcomes to ensure a maximum impact on patients.

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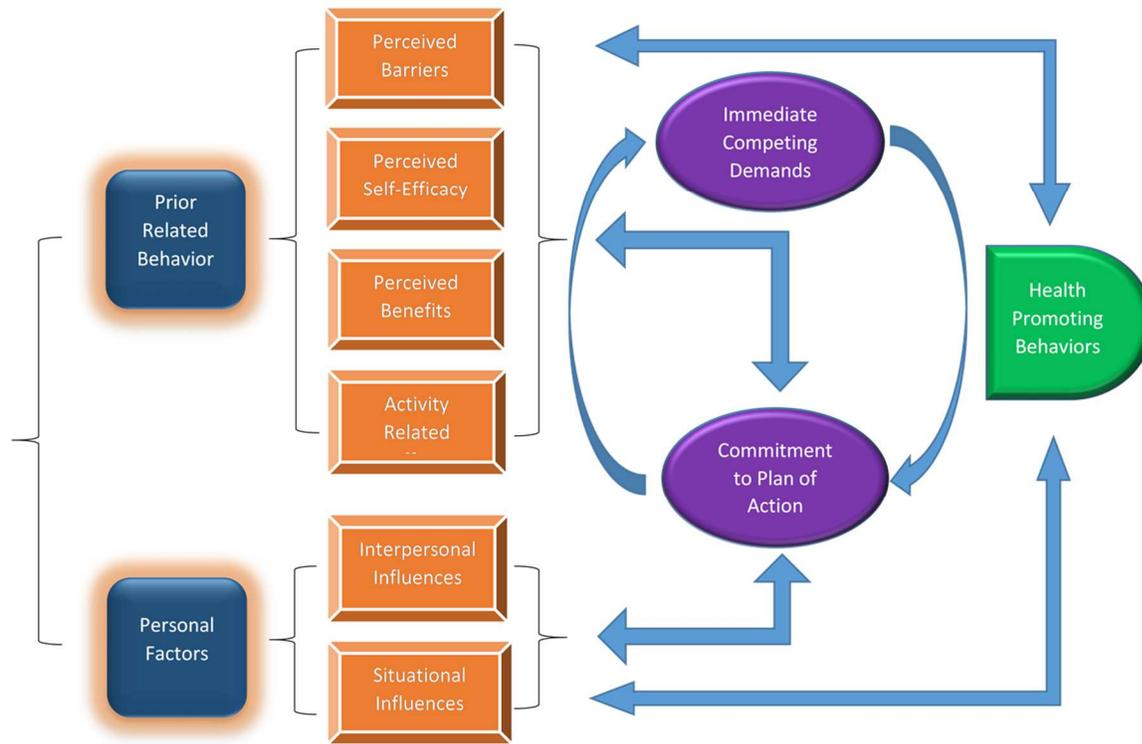
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**Appendix A:
Pender's Health Promotion Model**



Source: <http://userscontent2.emaze.com/images/6b30c3a7-8c61-4e5c-b15c-d52d9c1bf8ed/6abe642e-ad07-4ed3-87cf-084838b0f05a.png>

**Appendix B:
Human Subjects Approval Document**

Type of Review:	Initial Study
FWA#:	00003411
IRB#:	STUDY00141000
Title:	Perceptions of and barriers to dietary counseling among adults who have type II diabetes
Investigator:	JoAnn Peterson
IRB ID:	STUDY00131000
Exemption Category:	(2) Tests, surveys, interviews, or observation
Documents submitted for the above review:	<ul style="list-style-type: none"> • Exempt Project Description • RecruitmentLetter_KBlanding • DNP_Project_KBlanding • Letter of Support from Silvery City Health Center

Note: The IRB approved this submission as of 6/9/2017. This “exempt” approval is based upon the assurance that you will notify the HSC prior to implementing any revisions to the project. The HSC must determine whether or not the revisions impact the risks to human subjects, thus affecting the project’s “exempt” status. Projects that do not meet the “exempt” criteria must comply with all federal regulations regarding research.

Appendix C:
Recruitment letter to participants

(provided to participants at beginning of session, followed by survey at end of session)

Dear participant,

My name is Kristin Blanding and I am a student in the Doctor of Nursing Practice (DNP) program at the University of Kansas School of Nursing. I am recruiting participants to help me determine patients' perceptions of dietary counseling, and the barriers faced in following the dietitian's recommendations. Participation is purely voluntary, and the results of this project will be used to improve processes of care at Silver City Health Clinic.

Participation involves completing a brief survey at the conclusion of this session that will take approximately five minutes of your time. No identifiable information will be collected about you, and the survey will remain anonymous. In addition to the survey questions, demographic information such as age, gender, race/ethnicity/origin, and educational status will also be collected. If you agree to participate, please simply fill out the survey that will be handed out at the end of the session.

If you have any questions, please contact me at the information provided below. For questions about the rights of research participants, you may contact the KUMC Institutional Review Board (IRB) at (913) 588-1240 or humansubjects@kumc.edu.

Sincerely,
Kristin Blanding, RN, BSN, DNP student
kblanding@kumc.edu
(785) 323-7946

**Appendix D:
Project Budget**

The project leader volunteered to bring snacks to one of the dietary sessions as a way to show the participants some ideas of healthier food options. Food items included hummus with pretzel crisps, baby carrots, sliced-up peppers, and snap peas, as well as a fruit plate of grapes, strawberries, and pineapple.

Total was approximately \$20.

Appendix E:
Flier



**Learn how to manage
Diabetes through
diet and nutrition!**

- We invite you to take part in group dietary counseling if you have Type 2 diabetes.
- You must be age 18 and older and have a HgbA1c value that is at least 9%.
- We would like to find out your thoughts about dietary counseling by asking you to complete a short survey.

WHEN: Mondays in June and July from 1:00pm - 3:00pm

- Monday, June 5
 - Monday, June 12
 - Monday, June 19
 - Monday, June 26
 - NO session July 3
 - Monday, July 10
 - Monday, July 17
 - Monday, July 24
 - Monday, July 31
- You can attend one, several, or all sessions.
 - Family members and support persons are also welcome to join.

WHERE: South Branch Library

- 3104 Strong Ave, Kansas City, KS 66106

For more information or to answer any questions you may have, please contact Valorie Coffland at 913-945-7300.

Appendix F: Survey

Demographic Information

Instructions: Please read each question or statement carefully and circle your best answer(s).

1. What is your age?
 - a. 18-29
 - b. 30-39
 - c. 40-49
 - d. 50-59
 - e. 60-69
 - f. 70-79
 - g. 80-89
 - h. 90 and older

2. What is your birth sex?
 - a. Female
 - b. Male

3. What is your race or origin?
 - a. American Indian or Alaska Native
 - b. Asian American
 - c. Black/African American
 - d. Native Hawaiian or other Pacific Islander
 - e. White/Caucasian
 - f. Hispanic
 - g. Other (please specify):

4. What is your highest level of education?
 - a. Some high school
 - b. High school/GED
 - c. Associate's degree
 - d. Bachelor's degree
 - e. Master's degree and higher

5. How long ago were you diagnosed with diabetes?
 - a. Less than 6 months
 - b. 6 months - 1 year
 - c. 1 - 3 years
 - d. More than 3 years

Clients' Perceptions About Nutrition Counseling Survey

1. Was this your first time meeting with a dietitian?
 - a. Yes
 - b. No, I have met with one before

2. If you answered "No" in the previous question, did you find today's information to be more helpful or useful to you?
 - a. Yes
 - b. No
 - c. If no, please explain:

3. What was your reason(s) for attending today's dietary session? (check all that apply)
 - a. For general dietary advice
 - b. For reassurance that I was eating properly
 - c. To learn more about various food groups that affect diabetes (i.e. carbohydrates, sugars, proteins, fats, etc.)
 - d. To learn how to better manage my diabetes
 - e. Someone recommended that I see the dietitian
 - f. Other (explain):

4. What may be some of the reasons (barriers) that prevent you from being able to follow the recommendations made in today's session?
 - a. Cost of the food
 - b. Getting to the store (transportation, access, etc.)
 - c. The recommended foods do not match with my cultural/belief system
 - d. I think I will forget the types of food that were recommended
 - e. Lack of time to prepare the recommended foods / unhealthy foods are easier and quicker to prepare
 - f. My family members will not want to eat some of the things recommended / lack of support
 - g. It will be hard to change my eating habits
 - h. I am worried I will crave unhealthy food items / dislike of the recommended foods
 - i. I am worried I will eat unhealthy food when I am stressed or emotional
 - j. I am worried the recommended portion size is too small and will not satisfy my hunger
 - k. I have an irregular work schedule
 - l. The recommended foods are often not available at social events / family gatherings
 - m. It will be hard to find the recommended foods at the store

5. For the following, please circle how much you agree or disagree with each statement:
(1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
a. The dietitian provided useful information	1	2	3	4	5
b. The dietitian knew what he/she was talking about	1	2	3	4	5

c. The advice from the dietitian was suited to my needs	1	2	3	4	5
d. After this session, I know what to eat for my diabetes	1	2	3	4	5
e. After this session, I plan on changing my diet	1	2	3	4	5
f. I believe that if I make some changes to my diet, my diabetes will improve	1	2	3	4	5
g. After this session, I feel better about how to manage my diabetes	1	2	3	4	5
h. After this session, I feel in control of my diabetes	1	2	3	4	5
i. The dietitian provided support and encouragement	1	2	3	4	5
j. The dietitian cared about me	1	2	3	4	5
k. Anyone with diabetes should meet with a dietitian	1	2	3	4	5
l. There was no benefit in attending this session	1	2	3	4	5

6. Please feel free to provide any additional comments about today's dietary session or the information provided by the dietitian.

Thank you for taking the time to complete this survey. Your answers will help us provide better nutrition counseling services in the future. Please hand in your survey before leaving.

Kristin Blanding, RN, BSN, DNP student

**Appendix G:
Project Timeline**

April 14, 2017 – present proposal defense

May 2017 – receive IRB approval

May/June 2017 – begin project and recruit participants

June 5 - July 24, 2017 – dietary counseling sessions and data collection

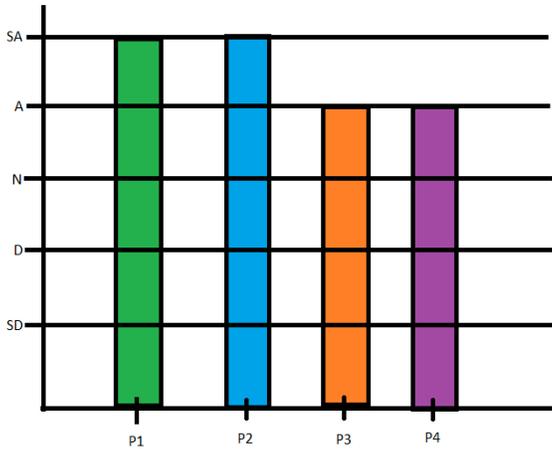
August/September 2017 – submit findings

October - December 2017 – DNP oral boards and public presentation

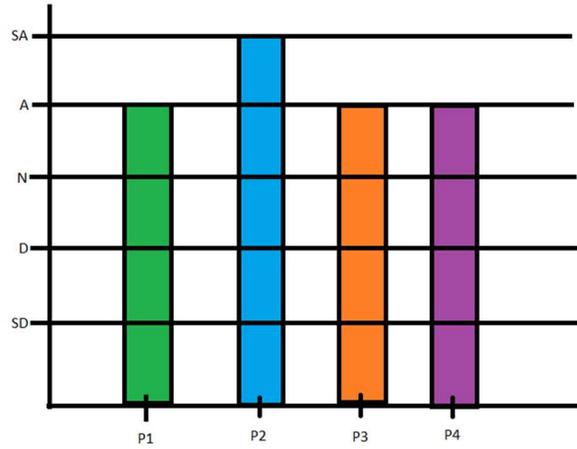
**Appendix H:
Data tables**

Question 5: For the following, please circle how much you agree or disagree with each statement: (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree)

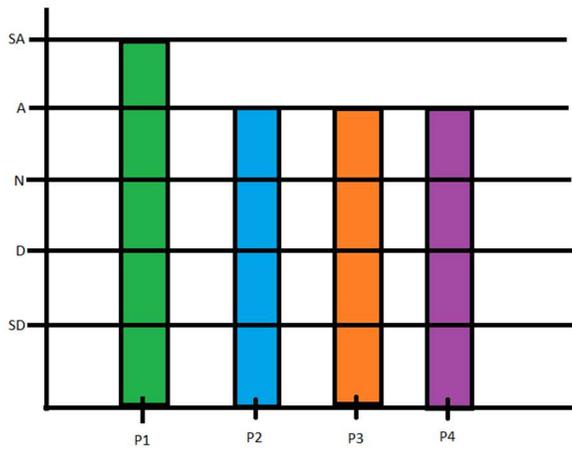
Key: SD = strongly disagree; D = disagree; N = neither; A = agree; SA = strongly agree; P1 = participant 1; P2 = participant 2; P3 = participant 3; P4 = participant 4



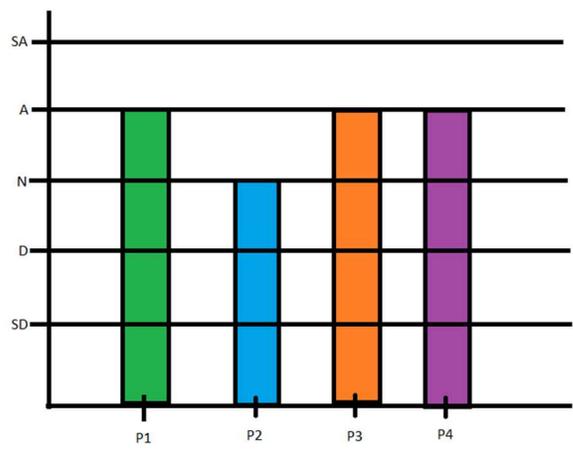
5a: The dietitian provided useful information



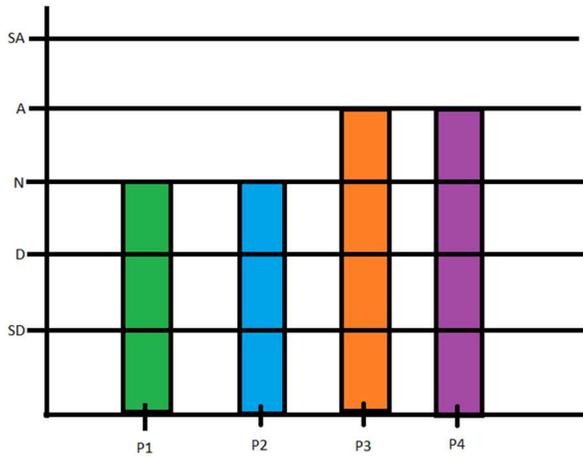
5b: The dietitian knew what he/she was talking about



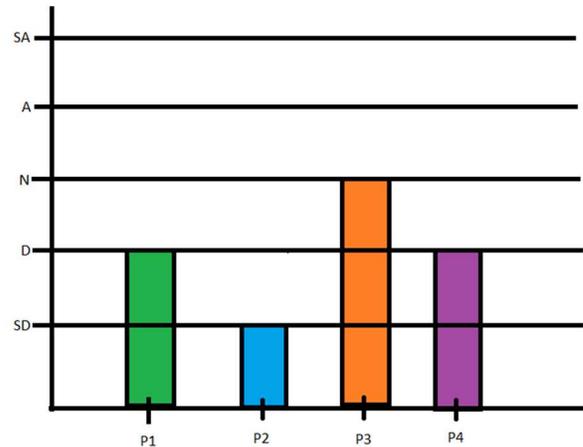
5c: The advice from the dietitian was suited to my needs



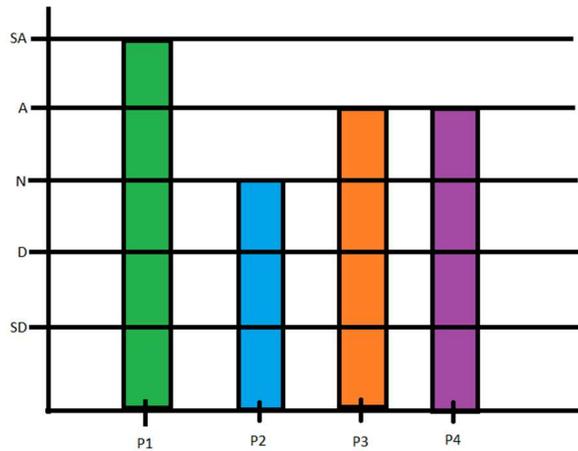
5d: After this session, I know what to eat for my diabetes



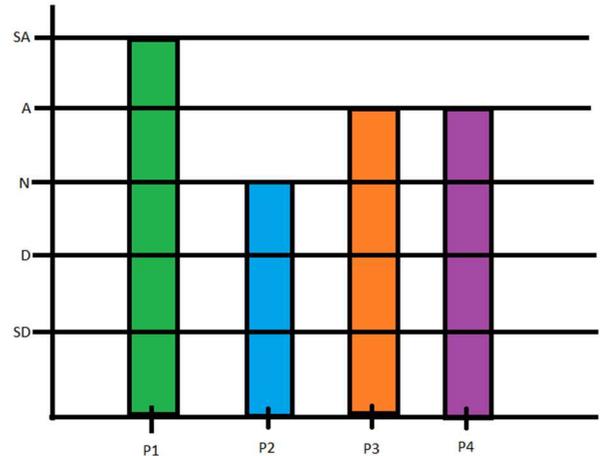
5e: After this session, I plan on changing my diet



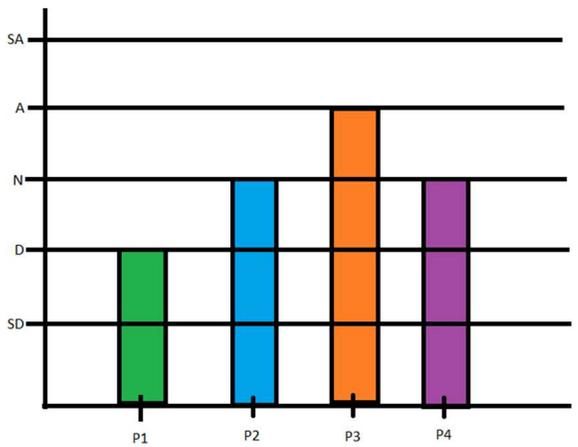
5f: After this session, I learned I did not need to change my diet as my intake was already suitable to my needs



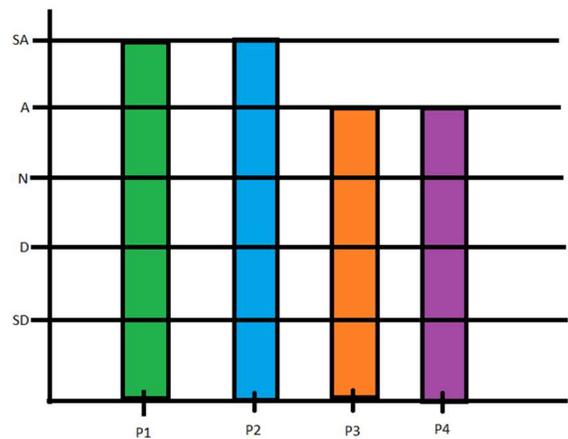
5g: I believe that if I make some changes to my diet, my diabetes will improve



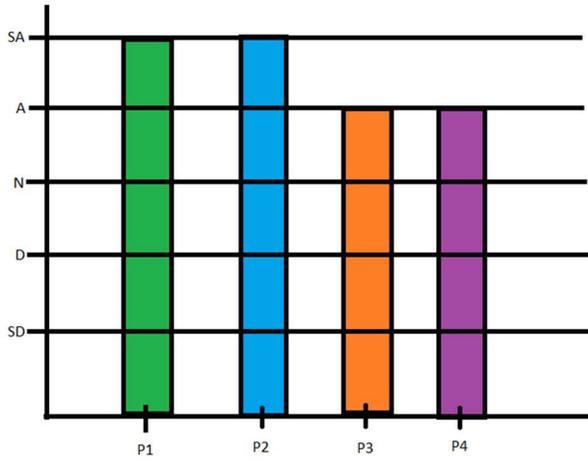
5h: After this session, I feel better about how to manage my diabetes



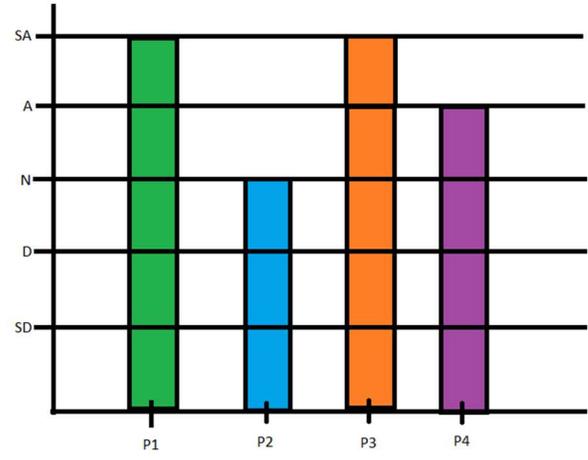
5i: After this session, I feel in control of my diabetes



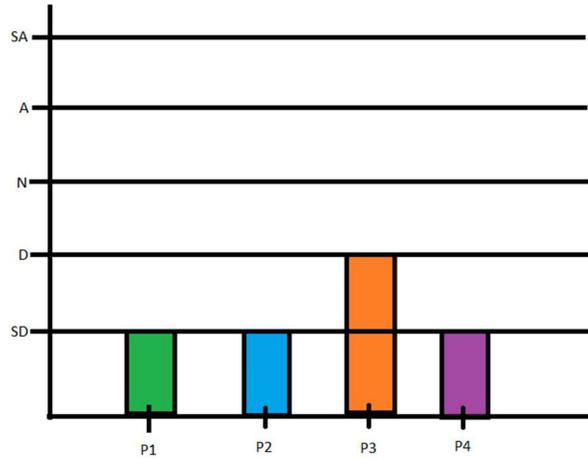
5j: The dietitian provided support and encouragement



5k: The dietitian cared about me



5l: Anyone with diabetes should meet with a dietitian



5m: There was no benefit in attending this session