

IMPROVING THE UTILIZATION OF DIABETES SELF-MANAGEMENT
EDUCATION AND SUPPORT (DSMES) FOR PATIENTS WITH
TYPE II DIABETES IN THE PRIMARY CARE SETTING

by

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ABSTRACT

Evidence suggests that diabetes self-management education and support (DSMES) programs result in numerous clinical, psychosocial, behavioral, and cost benefits. The American Diabetes Association (ADA) recommends that all patients with a diagnosis of type II diabetes (T2DM) should participate in ongoing DSMES. The ADA provides an algorithm that highlights four critical criteria for referral to DSMES, but substantial evidence suggests that these referral guidelines are not widely followed. The purpose of this project was to implement a standardized referral process in a central Montana primary care clinic using the ADA Algorithm of Care. Participating providers were educated about the ADA referral guidelines and asked to follow them diligently. The referral algorithm was uploaded to the clinic share drive and displayed on the wall of each exam room to encourage its use. Both pre- and post-implementation data were collected via electronic health record (EHR) chart review. The number of referrals sent was compared to the number of patients who met criteria for referral and displayed as a percentage using individual run charts for three separate categories: (1) new diagnosis of T2DM, (2) existing diagnosis of T2DM and no previous DSMES participation, and (3) existing diagnosis of T2DM with previous DSMES participation, but due for follow-up. Between November and December, 2021, the average referral rate for patients who met category 1 criteria was 100%. There were no new diagnoses of T2DM during the implementation phase (January 3–February 28, 2022), so no post-implementation data were recorded for category 1. The average referral rate for category 2 patients improved from 3.45% pre-implementation to an average of 9.8% post-implementation. For category 3 patients, the average rate of reminder to schedule follow-up care increased from 0% pre-implementation to an average of 11.8% post-implementation. While these numbers fell short of the desired goal, improvement was made. Despite successful standardization of the referral process, lack of time, poor compliance with the algorithm, and patient declination of referral proved to be significant obstacles. A longer implementation period and integration of the algorithm into the EHR would likely improve provider compliance and increase utilization of DSMES for patients with T2DM.

CHAPTER ONE

IMPROVING UTILIZATION OF DSMES FOR PATIENTS
WITH TYPE II DIABETES IN PRIMARY CARE

The prevalence of type II diabetes has markedly increased in recent decades. In 2018, 34.2 million Americans (10.5% of the population) were living with type II diabetes, and an estimated 7.3 million of these people were unaware of their diagnosis. In the same year, 88 million American adults had a fasting glucose or hemoglobin A1C in the prediabetic range (American Diabetes Association, 2021a). According to the American Diabetes Association (2021a), an average of 1.5 million Americans over the age of 18 and more than 1,750 children and adolescents between ages 10 and 19 are newly diagnosed with type II diabetes every year. As these numbers grow, the risk of comorbidities, hospitalizations, death, and healthcare spending consequently increase (Centers for Disease Control and Prevention, 2020; Harding, 2018).

While medications often play a substantial role in diabetes management, there is strong evidence to support the efficacy and cost-saving benefit of diet and lifestyle therapy in diabetes care. Although this may seem like a fairly simple task, research shows that most patients who have diabetes do not receive formal self-management education from their primary care provider (Evert et al., 2019). Too often, patients are told to “improve their diet and exercise more,” yet they do not receive counseling or reference materials that explain how to do this. Without ongoing self-management education in the primary care setting, patients with diabetes will lack

understanding about the behaviors and activities that contribute to slowing the progression of their disease and preventing comorbid complications.

Background Knowledge

Diabetes mellitus is associated with numerous macrovascular and microvascular complications, including cardiovascular disease, peripheral vascular disease, renal failure, retinopathy, neuropathy, and lower-limb amputation, and the risk for these complications is higher when the disease is uncontrolled (Harding, 2018). In 2016, 7.8 million hospital discharges included diabetes as a primary diagnosis; 1.7 million of these hospitalizations were for major cardiovascular events, 209,000 were for a hyperglycemic crisis, 130,000 were for lower-leg amputations, and 57,000 were for hypoglycemic episodes. Furthermore, diabetes was the seventh leading cause of death in the US in 2017, and more than 270,000 death certificates listed diabetes as an underlying or contributing cause of death (Centers for Disease Control and Prevention, 2020). With deterioration of health comes increased cost of healthcare services. The Centers for Disease Control and Prevention (2020) report that \$327 billion was spent on diabetes care in 2017, which is a drastic increase compared to the \$188 billion that was spent just 5 years prior in 2012.

National Recommendation

The American Diabetes Association (ADA) has issued a consensus report, along with six other nationally recognized diabetes organizations, recommending that all individuals with type II diabetes receive ongoing diabetic self-management education and support (DSMES) at the

time of diagnosis and periodically throughout the course of their chronic disease management

(Powers et al., 2020). According to Powers et al. (2020), DSMES is defined as:

The ongoing process of facilitating the knowledge, skill, and ability necessary for diabetes self-management as well as activities that assist a person in implementing and sustaining the behaviors needed to manage his or her condition on an ongoing basis, beyond or outside of formal self-management training. (p. 1639)

DSMES programs provide individualized education and support for patients living with diabetes.

Participants learn a variety of skills to help them cope with the diagnosis, adhere to medication regimens, monitor their blood glucose levels effectively, participate in physical activity within their capability, make healthy decisions about food, and ultimately reduce their risk for developing complications of the disease. Medical nutrition therapy (MNT)—treating the disease through modification of nutrient or whole-food intake—is a crucial component of the program, which is why a registered dietitian must maintain some level of involvement in the process (Powers et al., 2020).

Every 5 years, the National Standard for Diabetes Self-Management Education and Support are updated (last updated in 2017), which consists of 10 criteria that serve as guidelines for operating a DSMES program. The U.S. Centers for Medicare and Medicaid Services (CMS) has authorized two entities to award accreditation or recognition to a DSMES program: the American Diabetes Association and the Association of Diabetes Care and Education Specialists (Beck et al., 2017). According to Powers et al. (2020), referral to and facilitation of DSMES services is indicated at four critical periods: (1) at initial diagnosis, (2) annually, or sooner if a patient is not meeting target treatment goals, (3) when complicating factors of the disease present, and (4) when a significant transition in life and/or care occurs. These criteria are further defined in Appendix A.

The DSMES process becomes the foundation for helping patients with type II diabetes to navigate the decisions that are required to properly manage this complex disease. Benefits of the DSMES process include reductions in weight, hemoglobin A1C, hypoglycemia episodes, hospitalizations, and all-cause mortality, in addition to the promotion of positive lifestyle behaviors and the development of self-efficacy and empowerment. While DSMES has historically been conducted through formal didactic education in an outpatient hospital setting, integration into primary care and office practice is becoming increasingly necessary. As primary healthcare providers play an integral role in diabetes management, they must participate in the individualized and comprehensive education process to promote effective coping and decision-making skills that are essential for patients living with the disease (Powers et al., 2020).

Nationwide Practice Gap

Despite sufficient evidence of the effectiveness of DSMES in improving outcomes for patients with type II diabetes, Beck et al. (2017) acknowledge that this resource continues to be severely underutilized. A retroactive study conducted in a New York City hospital in 2013 revealed that only 38% of inpatients and 33% of outpatients with type II diabetes received self-management education, and the majority of this education was reported to be “unstructured” (Torres et al., 2015). Similarly, preliminary data were collected prior to implementation of a quality-improvement initiative to enhance the utilization of DSMES services at the University of Washington Neighborhood Clinics (a group of primary care clinics outside the Seattle, WA area). Very few patients (two to three each month, on average) were found to have utilized DSMES services in the pre-implementation phase, suggesting that barriers to accessing this resource exist in the primary care setting (Chomko et al., 2016).

Perhaps the most significant demonstration of underutilization of DSMES is evidence of fewer than 5% of Medicare beneficiaries with a diagnosis of diabetes utilizing these services, despite Medicare providing reimbursement for DSMES since 2000 (Strawbridge et al., 2015). Additionally, the Centers for Disease Control and Prevention report that only 6.8% of privately insured patients who have been diagnosed with type II diabetes participate in DSMES within the first year of their diagnosis (Powers et al., 2020). DSMES programs are a privilege that should be promoted by all healthcare providers who are caring for patients with type II diabetes. However, exploitation of this privilege has yet to gain momentum, and the reasons for this are multifactorial. These barriers will be further discussed in the review of literature.

Local Problem

A regional medical center in central Montana currently offers a comprehensive DSMES program that has been awarded recognition by the American Diabetes Association. The program is led by a registered dietitian and a certified diabetes educator, who work closely with an endocrinologist within the organization. While the program is available for all patients with type II diabetes in the surrounding area, it is not utilized to its maximal potential by patients who receive their diabetes care in a family practice setting. While several factors likely contribute to this gap in practice, three providers in a nearby primary care clinic admit to inadequate referral practices and lack of participation in in-office self-management education.

Primary care providers and staff in the aforementioned primary care clinic are committed to providing patient-centered care that acknowledges and respects individual health needs. An essential need for all patients with type II diabetes is the need to acquire the knowledge, skills, and confidence to assume responsibility for participation in self-management of their condition.

Historically, this clinic has not followed the ADA recommendation to promote and utilize a DSMES program for all patients with a diagnosis of type II diabetes at initial diagnosis, annually and/or when treatment goals are not met, when complicating factors of the disease arise, or when transitions in care occur. This practice gap has increased the risk for suboptimal clinical outcomes and higher cost of disease management for these patients.

Purpose

The chronic disease process of diabetes mellitus is significantly influenced by lifestyle behaviors, both positively and negatively. Poor nutrition, lack of physical activity, restless sleep, and high levels of stress can all contribute to a decline in one's diabetic disease state, consequently increasing the risk for disease complications, hospitalizations, and high cost of care. Alternatively, balanced nutrition and portion control, regular physical activity, restful sleep, and reduced stress can yield improvement in diabetes outcomes, fewer complications, decreased hospitalizations, and reduced cost of care. However, without proper education about how to implement these positive lifestyle modifications, patients with diabetes will lack the tools necessary to make self-management decisions, execute complex care activities, and accomplish their health goals (Powers et al., 2020).

The purpose of this quality-improvement initiative was to implement a standardized referral process in a central Montana primary care clinic using the ADA DSMES Algorithm of Care for patients with a diagnosis of type II diabetes, as well as to increase primary care provider participation in reinforcing the nutrition guidelines that are recommended by DSMES program leaders.

CHAPTER TWO

REVIEW OF LITERATURE

Clinical, psychosocial, behavioral, and cost benefits resulting from DSMES programs have been well-documented in the literature. Research demonstrates a reduction in the following outcome measures when DSMES is included in the care of patients with type II diabetes: hemoglobin A1C, onset and/or worsening of diabetes-related complications, emergency department (ED) visits, hospital admissions and readmissions, all-cause mortality, diabetes-related stress, and overall cost of care. Furthermore, evidence shows that participation in DSMES programs improves quality of life and increases self-efficacy and empowerment in people living with the disease (Powers et al., 2020).

Clinical Benefits

Hemoglobin A1C is the most clinically significant indicator of glycemic control. Current ADA guidelines state that a diagnosis of diabetes can be confirmed at an A1C of 6.5% or higher (American Diabetes Association, 2021b). A1C levels above this threshold indicate poor glycemic control and likely progression of the negative effects associated with type II diabetes, which is why a reduction in this clinical measure is one of the primary goals in the management of the disease. Numerous studies have proven the effectiveness of DSMES in facilitating a reduction in hemoglobin A1C (Brunisholz et al., 2014; Chrvala et al., 2016; Ku & Kegels, 2014; Powers, 2016; Powers et al., 2020; Steinsbekk et al., Tang et al., 2012; Tshiananga, 2012). On that note, it is important to mention that, although a reduction in A1C signifies lower blood

glucose levels, there is currently no evidence suggesting that DSMES increases the risk for hypoglycemia (Powers, 2016).

More than 60% of patients who participate in DSMES programs alone or in conjunction with traditional diabetes care, i.e., oral and/or injectable medications, achieve a reduction in A1C (Chrvala et al., 2016; & Ku & Kegels, 2014). When compared with traditional diabetes care modalities, DSMES is associated with an average A1C reduction of 0.45%–0.57% (Powers et al., 2020; Steinsbekk et al., 2012; Tshiananga, 2012). In their single cohort, longitudinal, prospective study, Tang et al. (2014) observed a 0.09% reduction in A1C immediately after a 2-year DSMES intervention implementation. However, when they followed up with participants 1 year after completing the study, an average A1C reduction of 0.93% was recorded. An even more impressive A1C reduction of 1.1% has been observed when DSMES participants engage in both group and individual educational sessions, according to a systematic review conducted by Chrvala et al. (2016). Brunisholz et al. (2014) declared that a 1% reduction in A1C is associated with a 15% lower risk for cardiovascular disease, meaning even the slightest decrease in A1C yields clinically significant risk reduction for patients, thus further supporting the necessity for DSMES involvement in all type II diabetes management plans.

Risk for microvascular and macrovascular complications increases as glycemic control decreases. Diabetes is the leading cause of kidney failure, the leading cause of new-onset blindness in adults aged 20–74, the underlying reason for 60% of nontraumatic lower limb amputations, and is associated with a two to four times greater risk of heart disease and stroke (Kent et al., 2013). As patients develop these comorbid complications, their risk of hospitalization and/or death increases exponentially. DSMES has proven to reduce the risk of

both of these events (He et al., 2016; Healy et al., 2013; Powers et al., 2020; Strawbridge et al., 2017).

According to Strawbridge et al. (2017), DSMES reduces the risk of hospitalization by 14%. In their claims-based observational study, the authors of this study found that the number of ED visits was 6% lower and the number of hospital admissions was 13% lower in patients who participated in DSMES compared to patients who did not. Additionally, in a retrospective analysis, Healy et al. (2013) found that the risk of readmission within 30 days of an initial hospitalization was 11% for patients with type II diabetes who received inpatient DSMES services, versus 16% for patients who did not receive this education or support. Lastly, He et al., (2016) conducted a meta-analysis of 43 randomized controlled trials that compared DSMES with traditional diabetes management and found that DSMES resulted in a 0.8% reduction in all-cause mortality in patients with type II diabetes.

Psychosocial Benefits

Living with a chronic illness can be extremely stress-provoking, and stress increases epinephrine, glucagon, growth hormone, and cortisol levels, all of which contribute to increased blood glucose levels (Kennedy et al., 2021). Learning to reduce and cope with this stress is an important component of successful diabetes management. Evidence suggests that DSMES can be effective in reducing diabetes-associated stress and depression symptoms, while improving treatment satisfaction, ability to cope with the diagnosis, and overall quality of life (Fisher et al., 2013; Powers et al., 2016; Tang et al., 2012; Thorpe et al., 2013). Fisher et al. (2013) found that 33% of patients with high diabetes distress and 60% of patients with moderate diabetes distress

prior to implementation of a computer-assisted DSMES intervention reported little to no distress 1 year after the intervention was implemented ($p < 0.001$). Patients who participated in the longitudinal study conducted by Tang et al. (2012) reported significant improvement in their perceived quality of life after utilizing DSMES services ($p = 0.02$).

Additionally, a significant amount of data display stronger feelings of self-efficacy and empowerment in patients with type II diabetes who utilize DSMES services compared to non-users (Krall et al., 2017; Ku & Kegels, 2014; Powers 2016; Powers et al., 2020; Steinsbekk et al., 2012). Ku & Kegels (2014) report increased ratings of positive attitude and perceived ability to achieve glycemic control in DSMES participants versus nonparticipants. Steinsbekk et al. (2012) conducted a systematic review with meta-analysis of randomized controlled trials that evaluated the effects of a DSMES intervention compared to traditional treatment for patients with type II diabetes. They found clinically significant improvement in self-efficacy and empowerment among DSMES intervention groups. Increased self-efficacy and empowerment facilitate healthy coping and enable patients to accept accountability for autonomous management of their disease.

Lifestyle/Behavioral Benefits

Diabetes management requires an unwavering commitment to self-care activities, but without formal education about what these activities are, how to maintain a strict commitment to them, and how to cope with the temptation to falter from them, patients will lack the necessary knowledge and equipment to be successful in practicing healthy behaviors (Hailu et al., 2019). There is strong evidence to support the improvement in diabetes knowledge and self-care activity compliance—i.e., following diet recommendations, performing foot care, and adhering to

medication regimens—in patients with type II diabetes who participate in DSMES programs (Fisher et al., 2013; Hailu et al., 2019; Ku & Kegels, 2014; Powers et al., 2020; Strawbridge et al., 2017; Tang et al., 2012).

Tang et al. (2014) found that patients who participated in DSMES achieved clinically significant improvement in following a healthy diet plan ($p = 0.03$), spacing carbohydrates evenly between meals ($p = 0.005$), and using insulin appropriately and effectively ($p = 0.047$) immediately after completion of the 2-year implementation phase, and that these improvements were maintained at the 1-year follow-up period. In a quasi-experimental study, Ku & Kegels (2014) witnessed a significant increase in diabetes knowledge ($p < 0.001$) and proper medication adherence ($p = 0.001$) as a result of DSMES participation. A randomized controlled clinical trial conducted by Hailu et al. (2019) revealed that overall diabetes knowledge was significantly greater in DSMES users ($p = 0.044$) and that these patients followed specific dietary recommendations ($p = 0.019$) and performed self-inspections of their feet ($p = 0.009$) more days per week than non-DSMES users. Similarly, Fischer et al. (2013) also report improvements in healthy eating, increased physical activity, and better medication adherence associated with DSMES. These data undoubtedly prove the effectiveness of DSMES in assisting patients with type II diabetes to make fundamental lifestyle changes that will help prevent further progression of their disease.

Cost Benefits

As highlighted above, DSMES has a strong potential to positively influence the physical, psychosocial, and behavioral health of patients with type II diabetes. Increased health status is

associated with decreased healthcare spending. According to the Centers for Disease Control and Prevention (2018), patients with diabetes accrue 2.3 times higher medical costs than patients without diabetes, with the average annual medical expenditure being \$16,750 per person, 57% of which is directly related to diabetes management. Research supports the use of DSMES programs to reduce these costs as a result of lower hospital admission and readmission rates and fewer diabetes-associated complications (Brown et al., 2012; Centers for Disease Control and Prevention, 2018; Powers, 2016; Strawbridge et al., 2017).

Powers (2016) presents a cost reduction of 39% for patients with type II diabetes who attended formal diabetes education appointments when compared to patients who did not attend these educational sessions. Strawbridge et al. (2017) evaluated 1-year outcomes of DSMES training among Medicare beneficiaries with a new diagnosis of diabetes and found that 1-year Medicare expenditures were an average of \$830 lower for DSMES users than non-users in the post-intervention period. Brown et al. (2012) conducted a study in which they forecasted disease outcomes, quality-adjusted life years (QALY) gained, and lifetime costs associated with different hemoglobin A1C levels. They concluded incremental cost-effectiveness ranging from \$10,995 to \$33,319 in savings (dependent on the baseline and ending A1C levels) per QALY gained as a result of DSMES in comparison with traditional diabetes care. As A1C reduction has been a proven outcome of DSMES participation, improved disease outcomes and decreased need for high levels of medical care can be expected, which consequently generates lower healthcare spending (Brown et al., 2012; Strawbridge et al., 2017).

Necessity of Proposed Intervention

According to the Centers for Disease Control and Prevention (2021), participation in DSMES programs requires a written referral from the physician, physician assistant, nurse practitioner, or advanced practice nurse who is managing a patient's diabetes. This means that, in order to reap the benefits discussed above, referral is the first step. National DSMES referral rates remain extremely low, so primary care providers should focus on implementing strategies that are known to help increase these rates. Research declares the decision-support strategy as the most effective process change strategy for increasing referrals (Angus et al., 2012; Buchanan et al., 2014; Cato et al., 2014; Ripley-Moffitt et al., 2015; Roberts et al., 2015). The Centers for Disease Control and Prevention (n.d.) defines decision support as “prompts, alerts, reminders, or screening and treatment algorithms [that] are used to assist healthcare providers in making referrals” (p. 14). The ADA Diabetes Self-Management Education and Support for Adults with Type 2 Diabetes Algorithm of Care (displayed in Appendix A) became the primary intervention for this project. A physical copy of this algorithm, along with nutrition/portion-control education, was placed in each exam room to serve as a prompt/reminder for providers to consider whether patients met criteria for referral during their primary care visits.

Limitations

Despite the indisputable value and effectiveness of DSMES, underutilization of these programs poses a threat to their success. As mentioned above, less than 7% of privately insured individuals with type II diabetes in the US participate in DSMES programs within the first year of their diagnosis, and an even lower percentage of Medicaid beneficiaries take advantage of this

resource (Powers et al., 2020; Strawbridge et al., 2015). Low utilization has been found to be the result of a variety of patient, provider, and programmatic barriers (Centers for Disease Control and Prevention, 2021; Powers et al., 2020). These barriers are further broken down below.

Patient Barriers

Research presents common themes in patient-reported barriers. Several studies have found that patient understanding of the value of DSMES is poor (Horrigan et al., 2016; Lawal et al., 2017; Winkley et al., 2014). Numerous studies also highlight the following patient-reported logistical concerns: (1) prohibitive cost of services, (2) lack of transportation or childcare, (3) excessive time commitment, (4) inconvenient DSMES service times or locations, (5) lack of culturally-tailored services, and (6) poor medical status that impedes ability to attend services (Centers for Disease Control and Prevention, 2021; Horrigan et al., 2016; Powers et al., 2020; Winkley et al., 2014). Further, in a qualitative study using semi-structured interviews of patients who had been newly diagnosed with type II diabetes, Winkley et al. (2014) found that many patients avoid participation in structured diabetes education because of the shame and stigma that they associate with the disease. Each of these reported barriers justifies a need for greater involvement by primary care providers in delivering and promoting DSMES during in-office appointments, as well as a need for compassionate counseling to help eliminate any negative stigma.

Provider Barriers

Common provider barriers reported in the literature include: (1) insufficient knowledge about the standards for DSMES, (2) unawareness of local DSMES services, (3) poor

understanding of the role that primary care providers play in the DSMES process, (4) confusion about how to refer patients to DSMES programs, (5) lack of provider reimbursement for diabetes counseling, and (6) general misunderstanding of the necessity and effectiveness of DSMES (Centers for Disease Control and Prevention, 2021; Lawal et al., 2017; Powers et al., 2020).

Additionally, referral rates may be negatively influenced by implicit bias. According to Chapman et al. (2013), primary care providers frequently judge patients' potential to benefit from particular services/treatments, and they often make false assumptions about the patient's eagerness and/or ability to participate in them. These barriers emphasize a need to provide primary care providers with more education about the value of DSMES and the logistics of referring patients to these programs. Finally, referrals should be based on the ADA recommendations for utilization of DSMES instead of perceptions about patient compliance.

Programmatic Barriers

Evidence suggests that lack of administrative support, limited diabetes education specialists in practice, inconvenient geographical location, inefficient referral processes, lack of marketing resources, and low reimbursement rates all contribute to poor utilization of DSMES services by patients with type II diabetes (Centers for Disease Control and Prevention, 2021; Powers et al., 2020). Insurance regulations pose one of the largest barriers to DSMES utilization. For example, rather than providing reimbursement based on individual needs, Medicare only provides reimbursement for a predefined number of DSMES hours every year. Additionally, and perhaps most significant to the purpose of this project, insurers will not consider reimbursement for DSMES services without a referral, and the referral must come from the primary provider who is managing the patient's diabetes (Centers for Disease Control and Prevention, 2021;

Powers et al., 2020). While some of these limitations are beyond immediate resolution, this should not hinder the responsibility of primary care providers to promote and facilitate DSMES services. Implementation of a streamlined referral process is an essential component of overcoming barriers to DSMES utilization.

Discussion

Prior to introducing the ADA algorithm of care, the DSMES referral process was not well-defined in the primary care clinic where this project took place. While providers in this clinic were occasionally referring patients with type II diabetes for consults with a local diabetes educator and/or registered dietician (primarily only at initial diagnosis or when their disease was extremely uncontrolled), their practice lacked consistency because they were not aware of an official referral algorithm. This inconsistency likely resulted in several patients falling through the cracks and missing out on the opportunity to participate in a program that could positively impact their overall health. By failing to follow the recommendation to utilize DSMES for all patients with type II diabetes, these providers have denied patients the best chance at reducing their A1C, decreasing their disease-related stress, enhancing their self-efficacy and empowerment, improving their adherence to a healthy lifestyle and self-management behaviors, and reducing their medical costs.

The mission statement for this particular primary care clinic reads, “[Our mission is to] improve the health, wellness, and quality of life of the people and communities we serve.” A strong argument has been made above to support the improvement of physical health, psychosocial wellbeing, satisfaction with treatment, and overall quality of life when DSMES is

included in the management of type II diabetes. While improved health and satisfaction may result in fewer healthcare needs and, thus, decreased income to the clinic, healthcare providers must never lose sight of their personal and professional mission(s). Most healthcare professionals have taken an oath to provide evidence-based care and make every effort to improve the health and quality of life of their patients.

Additionally, the clinic lists the following values as the underlying motivation for its operation: (1) treating every person with dignity, respect, and kindness; (2) keeping patients and colleagues safe; (3) empowering patients and employees; (4) inspiring collaboration; (5) driving excellence through learning, innovation, and continuous improvement; and (6) stewarding resources wisely. This quality-improvement initiative was evidence-based and the potential outcomes of the project directly aligned with the mission and values of the organization. Implementing the utilization of the ADA algorithm for DSMES referral has been a step in the right direction toward improving the management of type II diabetes in this primary care clinic, and it is expected that these efforts will continue to expand beyond the parameters of this project.

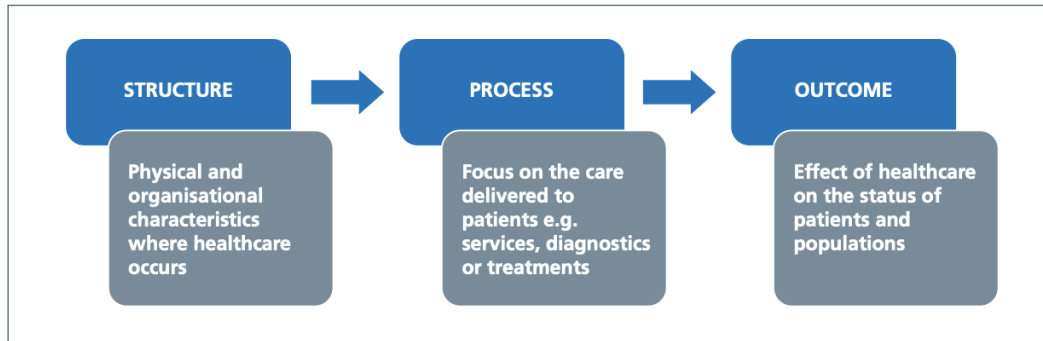
CHAPTER THREE

THEORETICAL FRAMEWORK

The theoretical framework that was utilized as the foundation of this quality-improvement project was Donabedian's model of quality care, which consists of three key components: structure, processes, and outcomes. Donabedian discovered that structure has an impact on processes and processes influence both short- and long-term outcomes (Donabedian, 2005). This framework was chosen because the goal of this project was to enhance the quality of care for patients with type II diabetes by implementing a new process that research indicates will improve clinical, psychosocial, and behavioral outcomes.

The Donabedian model is a popular template for quality-improvement projects (Polit & Beck, 2017). In this model, structure refers to the broad organizational resources that are necessary to implement an intervention, otherwise known as input measures. Further, processes reflect the activities that must be completed to accomplish the intended interventions and produce desired outcomes. Finally, outcomes demonstrate the direct, tangible results of the improved intervention (National Health Service England, n.d.; Polit & Beck, 2017). In summary, structure is what is invested, processes are what is done, and outcomes are what is achieved.

Figure 1. The Donabedian Model for Quality of Care

Figure 1: The Donabedian model for quality of care

Note. An outline of the Donabedian model for quality of care. From the *Online library of quality, service improvement and redesign tools: A model for measuring quality care*, by National Health Service England (n.d.). No copyright.

According to Donabedian (2005), measuring outcomes remains the principal method for validating the efficacy of a quality-improvement initiative. However, this model also highlights the importance of process measures because these are what create the connection between improvements and outcomes. If only outcomes are measured, then project leaders cannot prove that change has occurred and therefore cannot claim that the improvements had any influence on the outcomes (National Health Service England, n.d.). Logic models are an effective tool that can be utilized to illustrate the relationships between the three components of Donabedian's model of quality care. A logic model demonstrating the inputs, activities, and desired outcomes for this quality-improvement project is displayed in Appendix B.

Practice Site Description

Setting

As mentioned above, this project was implemented in a full-spectrum primary care clinic in central Montana that provides family medicine, internal medicine, women's health, and

pediatric care. The clinic also offers urgent care, X-ray, and laboratory services on the opposite end of the building from primary care services. The organization has partnered with the Centers for Medicare and Medicaid Services and proudly operates within the Comprehensive Primary Care Plus (CPC+) model. The goal of CPC+ is to improve the quality, access, and efficiency of primary care through evidence-based practice transformation and multi-payer payment reform. Participating clinics are granted additional financial resources and the flexibility to invest in their facility, improve quality of care, and reduce unnecessary services for their patients. This flexibility certainly played a role in the acceptance of the project, as the underlying goal for the project was to improve the quality of care for patients with type II diabetes.

On the primary care side of the clinic, providers and staff are organized into four care teams. The care teams are physically separated from each other and each team contains two to four providers (all teams contain at least one MD or DO, and some have a physician assistant and/or a nurse practitioner), a medical assistant (MA) for each provider, and one nurse coordinator. The goal of this design was to encourage collaboration and support between providers, as well as to reduce risk and improve quality of care in small teams. Providers may not be available to their patients at all times (i.e., if he/she is ill, takes a vacation, or if his/her schedule is full on a day when somebody needs to be seen urgently), meaning it may become necessary for another provider to become involved in that patient's care. In these situations, this clinic tries to ensure that these patients see another provider within the same care team as his/her primary care provider. This allows for some level of patient familiarization with providers and staff, which is essential for maintaining therapeutic relationships.

Because this clinic operates in individual care teams, providers and staff have limited daily interaction with their counterparts from other teams, and staff members are discouraged from accessing the charts of patients who do not see a provider within the team where they work. The author of this project proposal works as a part-time nurse coordinator for care team 2. This team is comprised of three providers (all MDs), three MAs (though two of the full-time MA positions are currently unfulfilled, so the care team has been utilizing part-time float staff), and two part-time nurse coordinators who split the role responsibilities. Despite inconsistent staff, providers in care team 2 demonstrated support and willingness to participate in this quality-improvement initiative. The author did not receive this same commitment from care teams 1, 3, and 4, which is why the project was implemented only in team 2. This will be further discussed under the Barriers to Implementation section.

Target Population

The target population for this project was any patient, despite gender, ethnicity, or age, with a new or existing diagnosis of type II diabetes who received their diabetes care from a primary care provider in the clinic where this new referral process was implemented. Further, special attention was placed on patients with type II diabetes who developed complicating factors of the disease and/or transitions in life or care, as providers are more likely to miss the opportunity to refer these patients to DSMES due to increased complexity of disease management during these critical times (see Figure 2 in Appendix A for example scenarios that meet these criteria). The importance of this special focus on particular patients was emphasized during the first step of the implementation plan, the education process (individual implementation steps are listed under Project Methods).

Description of Stakeholders

Several stakeholders played a role in the execution of this project: (1) the project leader, who works as a part-time nurse coordinator, (2) a second part-time nurse coordinator, (3) three primary care providers, (4) three MAs (inconsistent personnel, as mentioned above), (5) patients with type II diabetes who receive their diabetes care from one of the three primary care providers involved in this process improvement, and (6) the clinic manager, who provided approval to implement the project in care team 2 and to collect pre- and post-implementation data from the electronic health record (EHR) outside of the project leader's working hours.

It is important to define the roles and responsibilities of each stakeholder group so that readers understand how this process improvement was incorporated into the workflow of the care team. The clinic manager provides oversight for all clinical and nonclinical staff in both the family practice and urgent care departments. She has limited daily interaction with care team staff, but all process changes must first receive her approval. The providers in care team 2 deliver primary care services to patients across the lifespan. They follow a templated appointment schedule, which contains a combination of 15- and 30-minute timeslots. Approximately 90 patients with a diagnosis of type II diabetes are seen in care team 2 each month. Provider 1 sees an average of 40 patients, provider 2 sees roughly 30 patients, and provider 3 generally sees about 20 patients with this diagnosis every month (some patients might have more than one appointment in the same month, as well). These patients rely on guidance from their providers as they work toward achieving their health goals, trusting them to deliver the highest quality care. While healthcare providers and staff certainly play large roles in diabetes management, this chronic disease requires a significant amount of patient participation and self-discipline.

However, as discussed above, without providing them with the tools to successfully self-manage their condition, patients are at higher risk for noncompliance and poor outcomes.

Nurse coordinators are responsible for responding to phone calls and online patient portal messages, triaging patients over the phone, conducting all nurse visits (i.e., blood pressure checks, immunizations, COVID-19 testing, wound dressing changes, etc.), filling prescriptions using a clinic-wide prescription refill policy, and completing a daily task called chart prep. Chart prep entails the nurse looking forward to the next day's schedule, searching through each patient's chart, and preparing an Excel spreadsheet for the provider that lists things that will need to be addressed during each appointment (i.e., for diabetes follow-up appointments, the nurse searches for the last documented A1C, microalbumin, foot exam, eye exam, and dental exam, and then lets the provider know if any of these are due to be repeated based on clinic protocols).

MAs are responsible for rooming patients, collecting vital signs, completing medication reconciliations, entering orders into the order management system within the EHR, and assisting with in-office procedures (i.e., pap smears, IUD insertions, vasectomies, etc.). Nurses and MAs share the responsibility of facilitating any other task that is requested by a provider during and after each patient appointment, which includes sending referrals. If an immediate referral is requested (i.e., a referral to speak with one of the in-house behavioral health professionals), then the provider will make this request in person and a staff member in that care team will coordinate this meeting. However, if the referral is for a consult/service that will be attended at a later time, the provider submits this referral request electronically and the request automatically appears on a message board that is managed by the nurses and MAs who work in that respective care team.

More about the process of completing a referral will be discussed below under the Project Methods section.

Facilitators to Implementation

The data presented in the literature review built a strong case for the necessity of this quality-improvement project. These data were shared with the providers and staff in care team 2, which resulted in increased willingness to participate in the change initiative. Peer support and commitment from care-team members set the stage for a successful implementation process. The project leader's role as an employee of care team 2 was critical, as it allowed for prioritization of the project during both work and non-work hours, and because physical presence became necessary in order to keep providers focused on the goal of the intervention.

As mentioned above, research demonstrates increased referrals by primary care providers when the decision-support strategy is used. Again, this strategy relies on prompts/reminders and treatment algorithms to assist providers in making the decision to refer. The primary intervention in this project was a referral algorithm, which standardizes the process and should eliminate any hesitation to refer. Further, the algorithm was posted on the wall in each exam room to prompt providers to consider referral for every patient with a new or existing diagnosis of type II diabetes during his/her appointment. The author was confident that strict adherence to the decision-support strategy would produce the desired outcomes (which are discussed in detail under the S.M.A.R.T. Goals section).

Barriers to Implementation

As previously discussed, lack of rapport with providers and limited access to patient information in care teams 1, 3, and 4 impeded the project leader's ability to implement this project on a larger scale within the allotted timeframe of this project. A long-term goal for this quality-improvement initiative is for the improved referral process to be implemented by all four care teams within 1 year of project completion. However, logistically, the 2-month implementation phase of this project did not allow adequate time for one project leader to collect inputs, complete activities, and measure outcomes in all four care teams, especially with limited support from the teams that this author is not affiliated with. Clinic-wide implementation of this improved process will require additional time and leadership within individual care teams; a mission that will be pursued in the future.

The COVID-19 pandemic has placed substantial stress on clinic providers and staff, which contributed to the lack of widespread support for this project. For the past 2 years, endless process changes have been enforced in an attempt to adapt to the fluctuating status of the pandemic. These perpetual adjustments created some hesitancy to participate in additional change activities. Moreover, because the clinic is currently experiencing a significant staffing shortage, staff responsibilities have been stretched beyond their traditional boundaries in order to sustain workflow, and this workflow has been especially difficult to preserve with transient staff. This increased workload and staff burnout made it difficult to prioritize the project intervention.

The project leader also encountered several provider barriers throughout the implementation phase of this project. First, each of the three providers who participated in the project took time off during the implementation phase, whether due to illness or to accommodate

the nursing and medical assistant staffing shortage. Fewer work days equates to fewer patient appointments, which consequently decreased the number of opportunities to consider DSMES referral in January and February. Additionally, one of the providers admitted he “kind of forgot about [the algorithm]” after taking a week off in January. The project leader addressed this comment by reiterating the evidence-based benefits of DSMES programs and by asking the provider to please refocus and prioritize the intervention. Another provider shared that she didn’t feel like it was appropriate to focus on diabetes management if the patient was there for an unrelated acute concern (although the author shared that data would be collected from these acute visits if the patient had a diagnosis of type II diabetes). Admittedly, the author failed to anticipate some of these provider barriers and found it difficult to overcome such obstacles from a subordinate position.

Finally, patient compliance with referral recommendations was lower than anticipated. Providers cannot force patients to comply with recommendations and, while the project leader did expect some patients to decline referral, this proved to be a larger barrier than what was hoped. Probable explanations for this noncompliance will be considered in the Discussion in Chapter Four.

Project Design

Again, the purpose of this quality-improvement project was to implement a standardized referral process for patients with type II diabetes in a primary care setting utilizing the ADA guidelines for DSMES referral at four critical times, as well as to increase primary care provider participation in delivering nutrition education that is consistent with the DSMES curriculum.

S.M.A.R.T. Goals

Quality-improvement outcome measures must be specific, measurable, achievable, relevant, and time-based (Moran et al., 2020). Careful consideration of these criteria was taken as outcome measures were chosen for this project, and an explanation of each criterion is displayed in Appendix C. The desired outcomes for this process improvement included the following:

1. The DSMES Algorithm of Care (displayed in Appendix A) would be accessible from all clinic computers and 100% of care team 2 providers and staff would demonstrate accessing it before December 31, 2021.
2. 100% of care team 2 exam rooms would have the DSMES Algorithm of Care posted on the wall, and handouts containing diabetes nutrition/portion-control guidelines would be available in each of these rooms (the handouts would be restocked when rooms were running low on supply). This would help to stimulate conversation about healthy decision-making, as well as prompt consideration of DSMES referral during appointments.
3. 100% of patients who received a new diagnosis of type II diabetes during the 2-month implementation phase would be referred to a DSMES program.
4. 80% of patients with an existing diagnosis of type II diabetes who had an appointment in February, 2022, would be referred for DSMES services if: (1) they met any of the criteria for referral according to the ADA algorithm AND (2) they had not already been referred to a DSMES program in the past.
5. 80% of patients with type II diabetes who had already established care with a DSMES program in the past, and who had an appointment in February, 2022, would be reminded

to schedule follow-up DSMES care under the following three circumstances: (1) annually, or sooner if not meeting target treatment goals; (2) if new complicating factors arose; and/or (3) if a transition in care occurred (again, see example scenarios that meet these criteria in Appendix A).

For outcomes 4 and 5, a lower goal of 50% referral/reminder rates were set for January, as the project leader anticipated somewhat of a gradual climb to becoming compliant with the algorithm.

Project Methods

Steps

The following steps were taken to implement the new referral process (a timeline outlining these steps can also be found in Appendix D):

1. Care team 2 providers and staff were educated about the ADA guidelines for DSMES referral between December 14 and December 17, 2021 (all three providers were taking vacation time for the holiday, so this education was delivered before their time off).
2. The DSMES Algorithm of Care was uploaded to the clinic's shared desktop folder on December 17, 2021, and providers and staff were made aware of this.
3. The DSMES Algorithm of Care was posted on the wall of each care team 2 exam room and 10 copies of an ADA nutrition/portion-control informational packet were placed in the patient education drawers in each room on December 30, 2021 (more copies available in the nurse coordinator office).

4. Providers were asked to begin following the DSMES referral algorithm starting January 3, 2022 (as January 1st fell on a weekend and the clinic wasn't open). The project leader provided ongoing support and regularly reminded providers and staff about the importance of adhering to this algorithm.
5. Between January 3 and January 14, 2022, baseline data were collected via EHR review from the 2 months prior to the start of the implementation phase—November and December, 2021 (more details about the specific data that were collected is discussed below).
6. Post-implementation data were collected via EHR review at the ends of January and February, 2022.

Human Subjects Protection

The name of the facility that this project was implemented in, the name of the nearby organization that offers DSMES services, and the names of the providers and staff who were involved in executing the intervention remain confidential. During data collection, patient identifiers were replaced with numerical values (i.e., patient 1, patient 2, patient 3, etc.) and all data were stored in an Excel spreadsheet on a password-protected computer that was only accessible by the project leader. Risk to stakeholders was minimal given the anonymity that was sustained throughout the project. An exempt application for this quality-improvement project was submitted and approved by the Montana State University Institutional Review Board.

Measures

Measuring the success of desired outcome #1 was completed via direct observation of the ADA algorithm being uploaded to the clinic share drive and by observing care team 2 providers and staff access the document. Similarly, outcome #2 was measured via visualization of the algorithm being displayed on the wall of each exam room, as well as visualization of educational handouts in the drawers of these rooms. This visual assessment was repeated weekly to assure that each room remained stocked with these materials. To measure outcomes #3–5, a retrospective pre- and post-intervention chart review was completed by the project leader. The number of DSMES referrals sent was compared to the number of patients who were seen that met any of the ADA referral algorithm criteria. These numerical data were organized by month in an Excel spreadsheet.

CHAPTER FOUR

DATA COLLECTION

Following IRB approval, the project leader began collecting pre-intervention data by reviewing each appointment within care team 2 between October 1 and December 31, 2021. This data collection began prior to the release of the NRSG 675 Spring course schedule. The original plan was to collect 3 months of pre- and post-implementation data. However, upon reviewing the course schedule, there would only be enough time to record 2 months of post-implementation data due to chapter deadlines, so the October data was omitted from this analysis to achieve a more symmetrical evaluation. All patients with a new or existing diagnosis of type II diabetes who were seen by one of the three providers in care team 2 between the dates mentioned above were evaluated for referral eligibility based on the ADA referral algorithm. A number was assigned to every patient who met one or more of the referral criteria, and a yes or no indicating whether or not a referral was sent was recorded next to this number in Excel. Data were separated by month—a different Excel sheet was used for each month—and divided by color within each sheet to represent the three providers (these spreadsheets are displayed in Appendix E). Per the providers' request, patients were excluded from evaluation if: (1) they follow with endocrinology for their diabetes management and/or (2) they reside in a nursing home (because several of the nursing homes in town are currently having difficulty coordinating care and facilitating appointment attendance due to staffing shortages).

In order to separately analyze desired outcomes #3–5, data were organized into the following three categories for each month: (1) Patients who received a new diagnosis of type II

diabetes, (2) Patients with an existing diagnosis of type II diabetes who met any of the other ADA criteria for referral (aside from new diagnosis) and who had not already participated in DSMES in the past, and (3) Patients with an existing diagnosis of type II diabetes who had established care with a DSMES program in the past and met criteria for follow-up DSMES care. For patients who had established care with a DSMES program in the past but met the criteria for follow-up care, the project leader searched for documentation stating that the provider reminded the patient to schedule this follow-up during the appointment. The expectation to document such reminder was relayed during the first step of the implementation process (educating the providers about the algorithm). Again, for each patient who fell into this third category, a yes or no was recorded based on whether this reminder was given during his/her appointment. Following implementation of the new referral algorithm, the same data were collected and organized by provider and outcome in separate Excel spreadsheets for January and February, 2022, after the final day of each respective month.

Data Analysis

Descriptive statistics were utilized to analyze pre- and post-intervention data. Tables were used to display the data collected for outcomes #1 and #2, which can be found in Appendix E. For outcomes #3–5, the number of yeses recorded was compared to the number of patients who met the criteria for DSMES referral or follow-up reminder each month, and these percentages were plotted onto individual run charts (separate run charts were used for outcomes 3, 4, and 5). These are also presented in Appendix E. Color-coded lines were used to display data for individual providers, and a thicker black line represents collective data for the entire care team.

Results

Pre-Implementation Results

Regarding outcome #1, the project leader uploaded the DSMES Algorithm of Care to the clinic share drive and subsequently witnessed the successful demonstration of accessing the algorithm by all three providers and five staff members in care team 2 before the end of December, 2021. Regarding outcome #2, the project leader posted the DSMES Algorithm of Care on the wall and placed patient handouts containing nutrition and portion-control education in the drawers of all six exam rooms in care team 2. These two structural goals were met at 100% and a table displaying the data for each outcome can be found in Appendix E.

Providers in care team 2 saw 62 patients with type II diabetes in November, 2021, and, of these, 52 patients met criteria in at least one of the three categories for DSMES referral/reminder; one patient met category 1 criteria, 42 patients met category 2 criteria, and nine patients met category 3 criteria. The single patient who met category 1 criteria received a referral to DSMES (100%), one patient from category 2 was referred (2.4%), and no patients from category 3 were reminded to schedule DSMES follow-up care (0%), according to documentation from these visits.

In December, 2021, care team 2 providers saw 86 patients with type II diabetes, 71 of whom met criteria for either DSMES referral or reminder. Two patients met category 1 criteria, and both of these patients were referred (100%). There were 44 patients who met category 2 criteria, and two of them were referred (4.5%). Finally, 25 patients met category 3 criteria, but there was no documentation stating that any of these patients were reminded to schedule DSMES

follow-up (0%). Referral/reminder rates were further differentiated by individual provider and these monthly data spreadsheets and run chart analyses are presented in Appendix E.

Post-Implementation Results

Care team 2 providers saw 62 patients with type II diabetes in January, 2022—the first month that the new referral algorithm was implemented—and 47 patients met criteria for referral or reminder. No patients received a new diagnosis of type II diabetes in January, so there was no data collected for category 1 from this month. Of the 29 patients who met category 2 criteria, four were referred to DSMES (13.8%). Of the 18 patients who met category 3 criteria, two were reminded to schedule follow-up DSMES care (11.1%).

In February, 2022, care team 2 providers saw 67 patients with type II diabetes—51 of whom met criteria for referral or reminder. Again, no patients received a new type II diabetes diagnosis this month, so no data were recorded for category 1. There were 35 patients who met category 2 criteria, and only two of them were referred to DSMES (5.7%). Finally, two of the 16 patients who met category 3 criteria were reminded to schedule follow-up DSMES care (12.5%). Again, monthly data and run charts for each category are displayed in Appendix E.

The patients who were found not eligible for referral (10 patients in November, 15 patients in December and January, and 16 patients in February) were deemed so for one of three reasons: (1) they were already participating in DSMES per the ADA guidelines (meaning they had attended a session within the past year and did not meet any of the criteria that warrant more frequent follow-up), (2) they follow with endocrinology for management of their type II diabetes, or (3) they reside in a nursing home.

Of note, the DSMES Algorithm of Care was displayed on the wall of each exam room throughout the entirety of the implementation phase and will remain in place indefinitely. Additionally, the project leader did maintain a consistent supply of patient handouts available in each room throughout both January and February.

Discussion

As defined in Chapter One, the purpose of this quality-improvement initiative was to implement a standardized referral process in a central Montana primary care clinic that aligns with the ADA recommendations for utilization of DSMES with a diagnosis of type II diabetes at four critical times, as well as to increase primary care provider participation in reinforcing the nutrition guidelines that are recommended by DSMES program leaders. The project leader was able to successfully execute all intended implementation steps outlined in Chapter Three with minimal barriers, and the algorithm did accomplish standardization of the referral process. Additionally, though the total number of patient handouts distributed was not formally measured, providers did state that the handouts were given to several patients (which was also evidenced by the need to restock them twice during the implementation phase) and that this prompted more conversations about healthy nutrition and portion control. So, the purpose of the project was fulfilled, but the desired outcomes of the intervention were not fully met. While the results do indicate an increase in the number of patients who were referred to DSMES or reminded to schedule follow-up DSMES care, these rates fell short of the goal to reach 50% in January and 80% in February, suggesting that, despite successful standardization of the referral process, compliance with this process was a significant obstacle.

Pre-implementation project data confirmed the notion that DSMES services have been extremely underutilized by the participating providers, specifically for patients with an existing diagnosis of type II diabetes. The average referral rate for patients with an existing diagnosis who had not previously established care with a DSMES program was 3.45% prior to implementation of the new process. For patients who had established DSMES care in the past, the rate of reminder to schedule appropriate follow-up care when necessary was 0% in both months preceding implementation. While these rates do not account for the patients who were using DSMES services per ADA guidelines (at least annually, or more frequently if warranted), there were very few patients with a diagnosis of type II diabetes who had an appointment in November or December that didn't meet criteria for referral or reminder. This further supports the claim that DSMES has been widely underutilized in our community, which is consistent with the nationwide practice gap discussed in Chapter One.

Reassuringly, however, 100% of newly diagnosed patients were referred to DSMES even before utilization of the new algorithm began (although the volume of data available for this category of patients was very limited—only 3 patients in the pre-implementation phase). When asked, each of the providers who participated in the project agreed that they have consistently referred most, if not all, of their patients who are newly diagnosed with type II diabetes to DSMES, even prior to the proposal of the project. If this is true, though, then why did such a large volume of their patients meet category 2 criteria (existing diagnosis and no previous DSMES care)? This can likely be attributed to the fact that all three of these providers are fairly new to practice (provider 1 has been in practice for 2 years, provider 2 for 5 years, and provider 3 for 4 years), so many of their patients received their initial diagnosis from a previous provider.

Lack of DSMES care was likely overlooked when they established care with a care team 2 provider. Further, all three providers reported that they felt like it was unnecessary to refer patients whose disease had been stable with an A1C in their target range for several years. This was the case for several of the patients who were included in the data collection for this project because many patients with poorly controlled diabetes have been referred to endocrinology for management, and these patients were excluded from the data collection.

Additionally, there were a significant number of patients who had established care with the local DSMES program in the past, but did not schedule or attend follow-up care, neither routinely nor for poor control, complicating factors, or transitions in life/care, suggesting that there are barriers to fulfilling follow-up expectations after initial DSMES participation. Regarding routine annual follow-up, one provider admitted that he struggles to prioritize follow-up DSMES care after he has sent the initial referral because he believes that DSMES program leaders (the registered dietitian and diabetes educator) should be the ones tracking/coordinating this follow-up. The project leader then questioned this provider about his lack of recommendation to follow-up sooner than annually when patients were not meeting target A1C goals or had encountered a new complication of the disease (as was discovered to be the case for a few of his patients during EHR review), and he admitted that he simply failed to prioritize the referral algorithm in these instances.

Further, all three participating providers stated that several patients declined DSMES referral and/or follow-up because they did not feel like it would be beneficial. Some patients who had attended the program in the past felt like they could not gain any more from subsequent sessions. This project did not include any official collection of patient feedback on this matter

and, although the project leader did discover occasional documentation stating that DSMES was discussed and declined, there was no further explanation included in these notes. Consequently, such feedback was gathered indirectly from providers relying on memory of their discussion with patients. Perhaps patients declined DSMES referral or follow-up for one of the following reasons: misunderstanding about the value of DSMES, they were worried about the cost of the program, inconvenient appointment times, difficulty coordinating transportation to and from the facility, and/or they attended the program in the past and simply did not enjoy it.

Limitations

As mentioned above, the intervention for this project was structurally implemented without flaw. Unfortunately, though, compliance to the intervention became a substantial barrier. Poor prioritization of the algorithm by providers and lack of compliance with the recommendation to participate in DSMES by patients yielded suboptimal results. Perhaps the most restrictive limitation to overcoming these barriers was time. In order to meet course deadlines, the implementation phase for this project was very short, which limited the project leader's ability to analyze and adapt to challenges. The project leader would have liked to analyze data beyond the allotted timeframe, as new processes often require more than just 2 months to gain momentum, but she was pleased to discover even slight improvement following introduction of the referral algorithm.

Similarly, implementation of the intervention on a larger scale—for instance, implementing an official policy stating that all 14 providers in the clinic must use the referral algorithm—may have increased provider compliance, but there would not have been adequate

time for the project leader to collect data of this capacity. Finally, the project leader's role as a part-time RN (who works very seldom) in the setting where this project was conducted limited her ability to directly contribute to DSMES referrals and follow-up reminders. Care team 2 providers did receive thorough education about the efficacy of DSMES programs and were equipped with a standardized tool to increase utilization of this resource, but the project leader had no control over their decision to prioritize and comply with the algorithm, despite great effort to influence such decisions. Had the project leader implemented the intervention as a provider, herself—whether in a clinical rotation or in independent practice following graduation—then greater prioritization of the algorithm and higher referral/reminder rates would be anticipated.

Lessons Learned/Recommendations for Future Practice

The most prominent takeaway from this project is that change is hard. In the absence of relentless commitment from stakeholders, increasing utilization of DSMES by provider referral became an improbable ambition. Unfortunately, the providers who participated in this quality-improvement project did not prioritize the intervention that was introduced to the care team, and it seems as though some of the momentum to follow the algorithm was lost during the second month of implementation, particularly for patients who had never been referred to DSMES in the past. In future quality-improvement initiatives, the project leader will strive to maintain a more consistent physical presence at the practice site where change is occurring. She will also soon be in a better position (as a provider) to directly contribute to the execution of an intervention.

Nonetheless, although certain thresholds were not met, the project was not entirely unsuccessful, as some improvement was achieved with implementation of the algorithm.

The project leader would have liked to embed the referral algorithm into the EHR and programmed it to alert the provider when referral should be considered or when the patient is due for follow-up. However, the clinic manager was not confident that this could be accomplished in the particular EHR system that the organization uses, let alone in such a short period of time. The clinic does use a quality metric tracking program, so the project leader inquired about adding “DSMES participation” to this and programming it to alert the provider if the patient had never attended a DSMES session or if their last session was longer than one year ago, but this would not have accounted for the other criteria that warrant referral. There was also no way to assign a metric to a limited selection of providers, so the metric would be recorded for any provider who sees patients with a diagnosis of type II diabetes and, if they did not respond to the alert (many providers would have failed to respond because they were not participating in the project), then this would reflect poorly on their quality compliance rates and negatively affect their CPC+ compensation (the incentive discussed in Chapter Three). Fortunately, though, the clinic will be transitioning to a new EHR system later this year, and informatics personnel are confident that it will be much easier to build an algorithm into the new order management system. Doing so would likely increase prioritization of and compliance with the DSMES Algorithm of Care, as well as promote greater participation in the new intervention from a larger volume of providers.

Reflecting back on the process and outcome measures, the project leader realized that it would have been helpful to formally collect feedback from patients about why they declined referral or follow-up. This could have been done with a simple questionnaire asking them to

select the reason they chose to decline from a list of the most common patient barriers (which were discussed in Chapter Two). The questionnaire could also include “other (please explain)” as a choice, with space available for the patient to provide personalized feedback. This would have given the project leader a little more insight into why the intervention was not as successful as she had hoped. After analyzing this feedback, accommodations could be made in an attempt to overcome the reported barriers. If such modifications did, in fact, result in increased utilization of DSMES services, then the project leader’s next step would be conducting a longitudinal study to evaluate the impact of DSMES on A1C, weight, and psychological status.

Conclusion

Participation in DSMES per ADA guidelines has proven to influence several clinical, psychosocial, behavioral, and cost benefits. Despite this well-documented efficacy, however, providers in a central Montana primary care clinic have failed to prioritize utilization of a local DSMES program. The purpose of this project was to close this practice gap by implementing a standardized referral algorithm, which was structurally accomplished. Lack of provider and patient compliance with the algorithm were considerable barriers to achieving desired outcomes, but progress was made toward increasing utilization of DSMES for patients with type II diabetes in the primary care setting. The project leader looks forward to continuing to prioritize this quality-improvement initiative in her future career as a nurse practitioner.

CHAPTER FIVE

REFLECTION ON DNP ESSENTIALS

The DNP Essentials

As I approach the end of my Doctor of Nursing Practice (DNP) education, I am overwhelmed with a myriad of emotions. Like many new graduate nurse practitioners, I am experiencing some nerves and apprehension, but I am confident in my knowledge and skills and will enter this new career with great pride and excitement. I have so much gratitude for the Montana State University Family Nurse Practitioner program and the faculty's dedication to preparing me to excel as a primary healthcare provider. As I prepare to market my skills to a potential future employer, I reflect on the growth that I have made in my pursuit to meet the eight Essentials of Doctoral Education for Advanced Nursing Practice, and this reflection is discussed below.

Essential I: Scientific Underpinnings for Practice

The American Association of Colleges of Nursing (2006) states that nursing professionals must have a strong scientific foundation in order to safely address current and future practice issues. Scientific knowledge is the foundation of healthcare and, as a DNP graduate, I will be expected to translate this knowledge quickly and effectively in order to best serve my patients. Advanced Pathophysiology (NRS 602) was an excellent introductory course that laid the groundwork for learning about disease processes and how to effectively treat them. I remember Dr. Krogue telling us that first semester, "whenever you are trying to wrap your head

around a disease—why it causes the symptoms that it does and why it responds to a specific treatment—bring it back to the physiology and what is actually happening inside the body.” This advice has stuck with me and I have practiced this approach in each of the clinical courses as I learned about each body system and how to diagnose and treat different illnesses.

Over the course of the semester in NRSG 602, each student created a case study for a specific disease, which included the patient’s presenting symptoms, the diagnostic process, and the treatment plan. Each case study was followed by a list of questions about the physiologic process of the disease, its effect on different organ systems, the diagnostic reasoning, and rationalization of treatment modalities. I remember feeling so intimidated by these case studies because they tested my knowledge beyond the common symptoms of/treatments for each disease. I had to be able to explain the science behind these symptoms and treatments, and this was challenging. Fortunately, though, I have carried this foundational knowledge with me throughout every class exam and clinical scenario that I have faced, which has contributed to my successful academic journey. As medicine evolves and new science emerges, I will continue to remain sensitive to these changes and apply them to my clinical practice.

Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking

As an autonomous healthcare provider, my responsibility for meeting the needs of my patients and my community will grow exponentially. The American Association of Colleges of Nursing (2006) states, “DNP graduates’ practice includes not only direct care but also a focus on the needs of a panel of patients, a target population, a set of populations, or a broad community” (p. 10). My ultimate goal as a future family nurse practitioner will be to improve patient

outcomes and eliminate health disparities in my community, which will require exceptional skills in organizational and systems leadership.

In Design of Healthcare Delivery Systems (NRSG 608), I utilized systems engineering concepts and tools to evaluate individual processes in healthcare. I spent a significant amount of time observing different processes in my place of work, examining individual roles and their responsibilities for completing a given task. Each process was broken down into its fundamental steps using visual tools (value stream maps, flowcharts, pareto charts, fishbone diagrams, run charts, and spaghetti diagrams), which taught me how to effectively collect data and facilitated my ability to identify two things: (1) practices that add value to a patient's care and/or the healthcare organization and (2) practices that create barriers to delivering high-quality patient care and/or efficient operation within the organization. I utilized root-cause analyses and problem-solving to generate suggestions for improvement.

I then carried these newly acquired skills into Program Planning & Evaluation, Outcomes & Quality Improvement (NRSG 611) and DNP Scholarly Project (NRSG 675), as both classes challenged me to identify a practice problem, collect data to support such claim, and utilize evidence-based research to propose a solution. In NRSG 611, I worked as part of a group to present a quality-improvement initiative, in which step-by-step implementation, data collection, and data analysis plans were proposed. While this initiative was not formally executed in clinical practice, the project planning/development skills that I gained from the class did help to prepare me for NRSG 675 and the successful implementation of my scholarly project in the family practice clinic where I work. The American Association of Colleges of Nursing (2006) states that DNPs must conduct an ongoing evaluation of care delivery approaches and never stop working

to deliver care that meets the current and future needs of their patient populations. These values were prioritized in the classes that I mentioned above, and my enthusiasm for quality improvement will surely translate into my future practice.

Essential III: Clinical Scholarship and Analytic Methods for Evidence-Based Practice

The American Association of Colleges of Nursing (2006) states, “Nurses have long recognized that scholarly nursing practice is characterized by the discovery of new phenomena and the application of new discoveries in increasingly complex practice situations” (p. 11). As a future advanced practice nurse, I must integrate knowledge from a variety of sources and apply this knowledge in ways that will improve patient outcomes and overall clinical practice. In Evidence-Based Practice I and II (NRSG 604 and 605) and Statistical Applications (NRSG 606), I learned how to critically appraise literature, translate research to clinical practice, develop practice guidelines, and disseminate findings to larger populations.

I completed several article appraisals in these classes of both qualitative and quantitative methodology studies. The repeated practice allowed me to refine my critical appraisal skills and I felt like I became much more efficient at critiquing literature and evaluating both the statistical and clinical significance of research results. Previously, I spent an extensive amount of time just trying to narrow down my initial literature search, but I now feel more confident in my ability to quickly identify valuable and reliable research. Evidence-based practice makes up the foundation of nursing science and, in order to utilize it properly, nursing professionals must become proficient in analyzing literature, generating and sharing knowledge, and translating research into

practice. The three classes that I discussed above did a great job of preparing me for these obligations that I will carry as a nurse practitioner.

Essential IV: Information Systems/Technology and Patient Care Technology for Improvement and Transformation of Health Care

As healthcare practices continue to evolve, clinicians are expected to familiarize themselves with new patient-care technologies and informatics equipment. Knowledge and skills related to these devices and information systems allow healthcare professionals to “apply new knowledge, manage individual- and aggregate-level information, and assess the efficacy of patient-care technology appropriate to a specialized area of practice” (American Association of Colleges of Nursing, 2006, p. 12). Advanced practice nurses must utilize information systems and patient-care technology to deliver healthcare and to evaluate practice standards and patient outcomes. Health Care Informatics (NRS610) prepared me to meet this expectation and taught me to take full advantage of technological advancements in healthcare.

In this class, Dr. Wines asked us to identify a critical event that occurred in our workplace, think about how informatics technology might have played a role in avoiding the event, and then create a proposal for implementing such technology in that facility. I instantly recalled a tragic event that may have been prevented had I been able to connect with a patient via telehealth technology (this was pre-pandemic, when telehealth services were not as widely available as they are now). I was unfamiliar with the logistics of implementing telehealth services prior to this project, but through extensive research, I acquired endless knowledge about the process of initiating telemedicine. By the end of the project, I truly felt like I would feel comfortable installing the technology and implementing the program in a real clinical setting.

This informatics technology project helped me build proficiency in the use of information systems and technology, which will play a vital role in my career as a healthcare professional.

Essential V: Health Care Policy for Advocacy in Health Care

All nursing professionals share the responsibility of advocating both for patients and the profession as a whole, which often requires becoming involved in healthcare policy.

“Engagement in the process of policy development is central to creating a health care system that meets the needs of its constituents” (American Association of Colleges of Nursing, 2006, p. 13).

Advocating for the nursing profession and practicing proactivity in healthcare policy are often challenging feats, but my comfort level with these actions grew as I completed the coursework for Advanced Practice Nursing Leadership (NRSG 609) and Ethics, Law, and Policy for Advocacy in Healthcare (NRSG 612).

In NRSG 609, I worked with a group of students on several exercises and projects that tested our ability to demonstrate leadership and advocate for nursing professionals, patients, and community members. I know I will face several challenges throughout my career, so I am happy to have participated in a course that taught me how to investigate existing policies, identify a need for improvement, and communicate with policymakers to navigate change. In NRSG 612, students were assigned different books that contained ethical, legal, and political dilemmas. We identified issues in each of these dimensions and presented our findings to classmates, which generated some very insightful discussions. I learned that transformation in healthcare only happens when somebody voices its necessity, demonstrates leadership, and initiates action. Political activism and policy development are essential in healthcare, and I will do my part to contribute to these efforts in my future career.

Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes

Healthcare is a multidimensional entity that depends on the collaboration between professionals of varying areas of expertise. Advanced practice nurses carry a responsibility to facilitate and encourage this collaboration and demonstrate leadership in interprofessional teams (American Association of Colleges of Nursing, 2006). Throughout my clinical rotations, I have had numerous opportunities to collaborate with various healthcare professionals: specialists, surgeons, behavioral health experts, dentists, physical therapists, dietitians, community-health leaders, social workers, etc. I have discovered how essential these partnerships are for providing cohesive care, which really does improve patient outcomes and promote whole-body wellness.

Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health

Healthcare professionals of all disciplines share a responsibility to promote health and prevent illness in their communities (American Association of Colleges of Nursing, 2006). However, the process of achieving these goals may not be consistent in different communities as diverse populations exhibit unique health needs. Although Montana contains less cultural diversity than many other states, numerous vulnerable populations call Montana home, and great disparity exists among the various dimensions of health within these populations.

Providing the care and resources necessary to meet the individual health needs of a particular population group requires consideration of that population's vulnerabilities. In our Vulnerability and Health Care in Diverse Communities class (NRSG 614), we were challenged to explore these vulnerabilities for several Montana populations. Groups investigated the individual- and community-based risks for vulnerability in different populations that we will

likely care for in our future careers. While my project focused specifically on the growing Latino population in Montana (from which I gathered numerous resources that I will utilize in my future practice), I also gained a wealth of knowledge about several other vulnerable populations in our state from reading and listening to the information presented by my peers. After taking this class, I am excited to continue growing in my cultural competence and will encourage my future colleagues to do the same.

Essential VIII: Advanced Nursing Practice

As I prepare to practice as an independent provider, I am expected to demonstrate polished assessment and diagnostic skills, as well as to conduct a multidimensional approach to clinical practice. The Advanced Health Assessment (NRSG 601) and Diagnostic Reasoning (NRSG 607) courses facilitated my development of these essential skills, and my Advanced Clinical courses (NRSG 621, 622, 623, and 624) have allowed me to practice and fine-tune these skills in the family practice setting. The American Association of Colleges of Nursing (2006) states that all DNP programs should provide preparation within the distinct specialty that the graduate will practice. I believe the Montana State University DNP-FNP program has done an excellent job in preparing me to provide full-spectrum primary care, and I look forward to pursuing a position in this field.

The Shadow Health and DxR virtual simulation programs that were used in NRSG 601 and NRSG 607, respectively, helped me grow in my ability to collect a detailed health history, conduct a thorough physical exam, generate a list of differential diagnoses, and formulate a treatment plan. Completing these virtual case studies helped build my confidence as I prepared to evaluate and treat real patients in the clinical setting. While I sometimes doubted my clinical

judgment in earlier clinical rotations, I have received excellent mentorship from each of my clinical preceptors, and my self-confidence has markedly improved over the past several months. In NRSG 607, I remember Dr. Stellflug saying “trust your assessment, trust the diagnostic tests, and use all of the information that you have gathered to come to the most likely conclusion.” I am finally listening to this advice. I have accepted the fact that I am not going to have all of the answers for every patient, but as long as my approach is thorough and I utilize resources wisely, I am confident that I will be able to deliver high-quality care to my patients.

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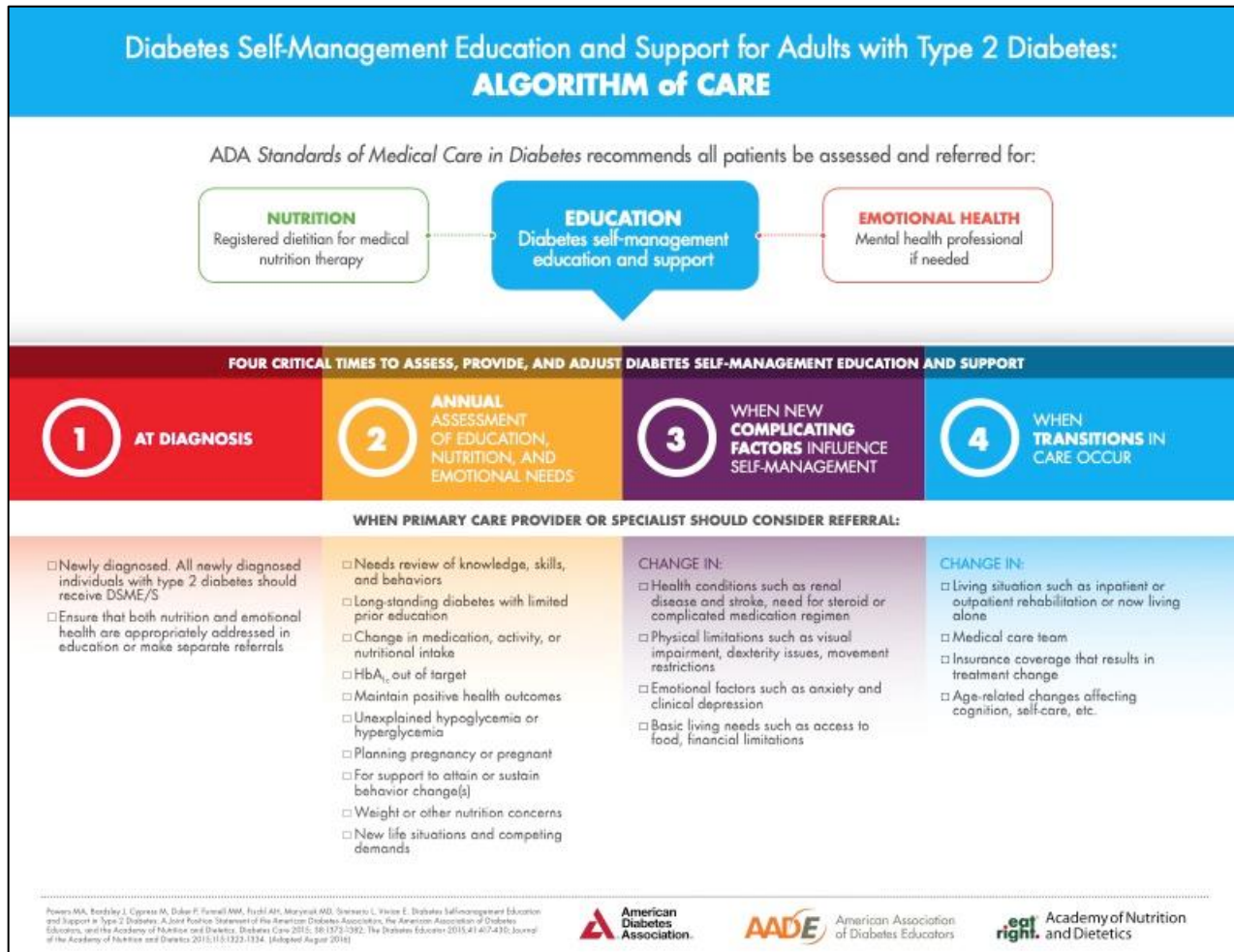
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APPENDICES

APPENDIX A

DIABETES SELF-MANAGEMENT EDUCATION AND SUPPORT FOR
ADULTS WITH TYPE 2 DIABETES: ALGORITHM OF CARE

Figure 2: Diabetes Self-Management Education and Support for Adults with Type 2 Diabetes: Algorithm of Care

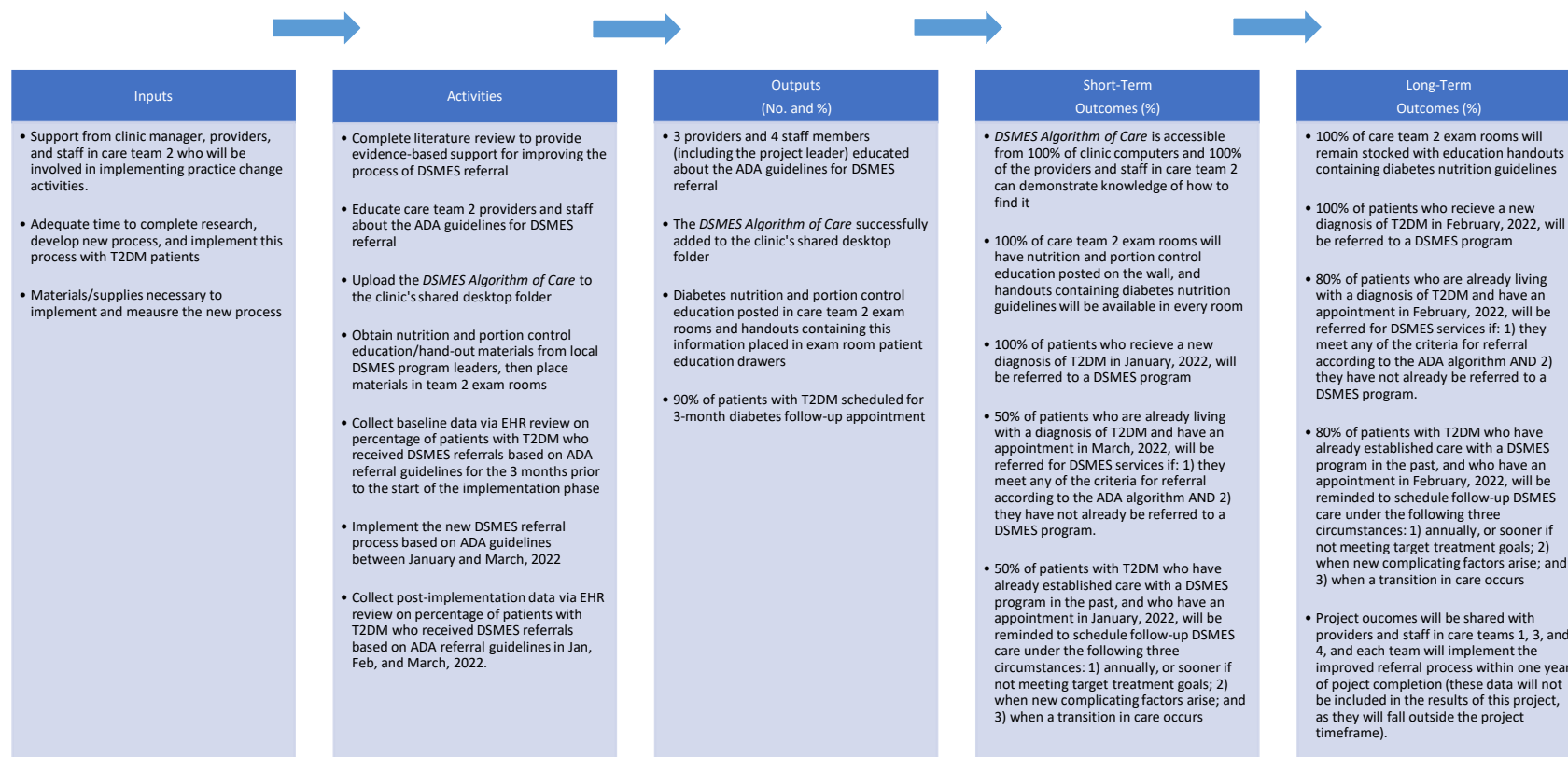


Note. This algorithm illustrates examples of scenarios that meet criteria for each of the four critical times that DSMES referral is recommended. From “Diabetes self-management education and support algorithm of care: Tools for use and dissemination,” by Bardsley et al., 2017, *AADE in Practice*, 5(5), p. 24

APPENDIX B

LOGIC MODEL

Figure 3: Logic Model



* Abbreviations:

ADA = American Diabetes Association

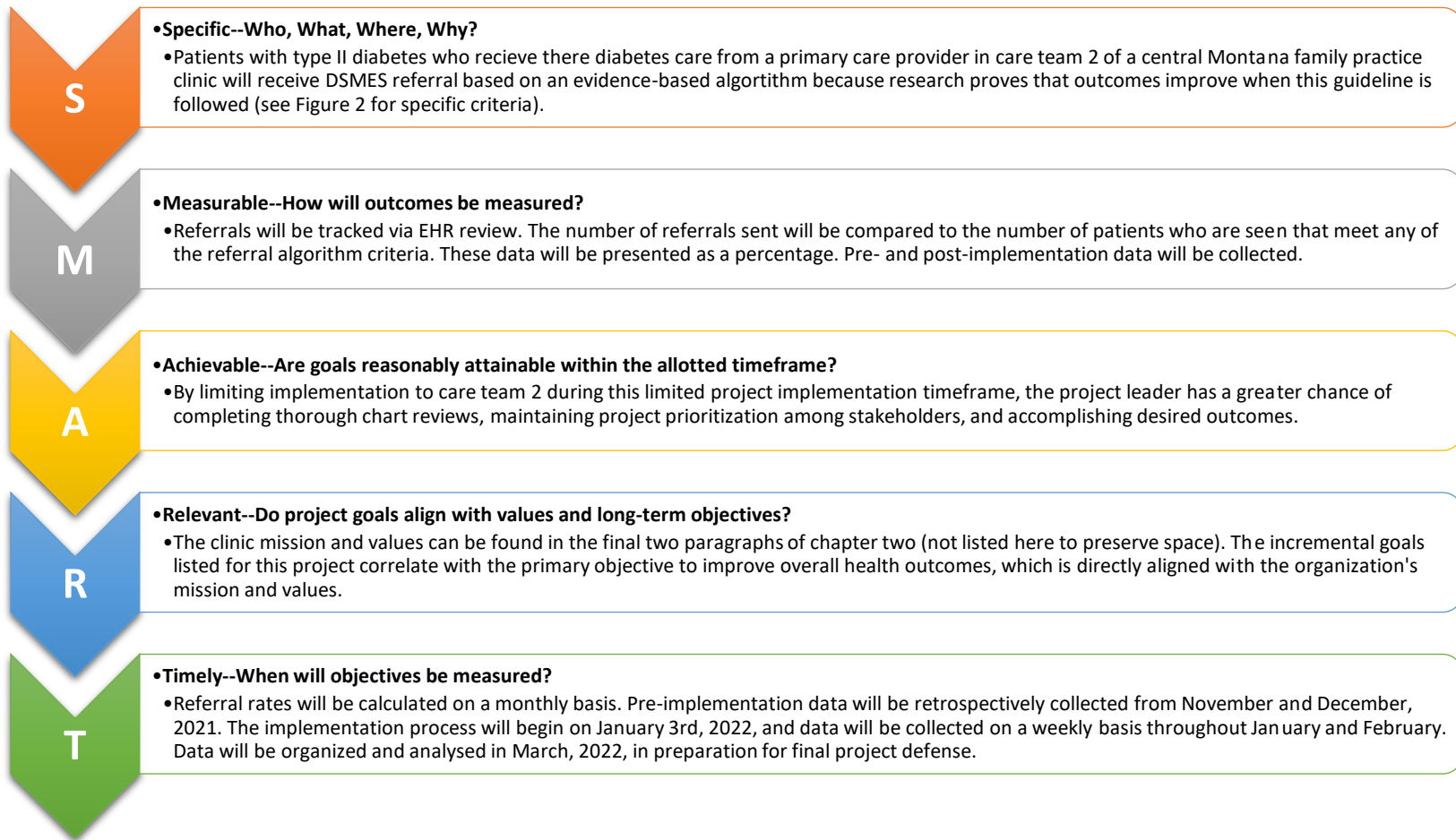
DSMES = Diabetes Self-Management Education and Support

T2DM = type II diabetes mellitus

APPENDIX C

S.M.A.R.T. GOALS

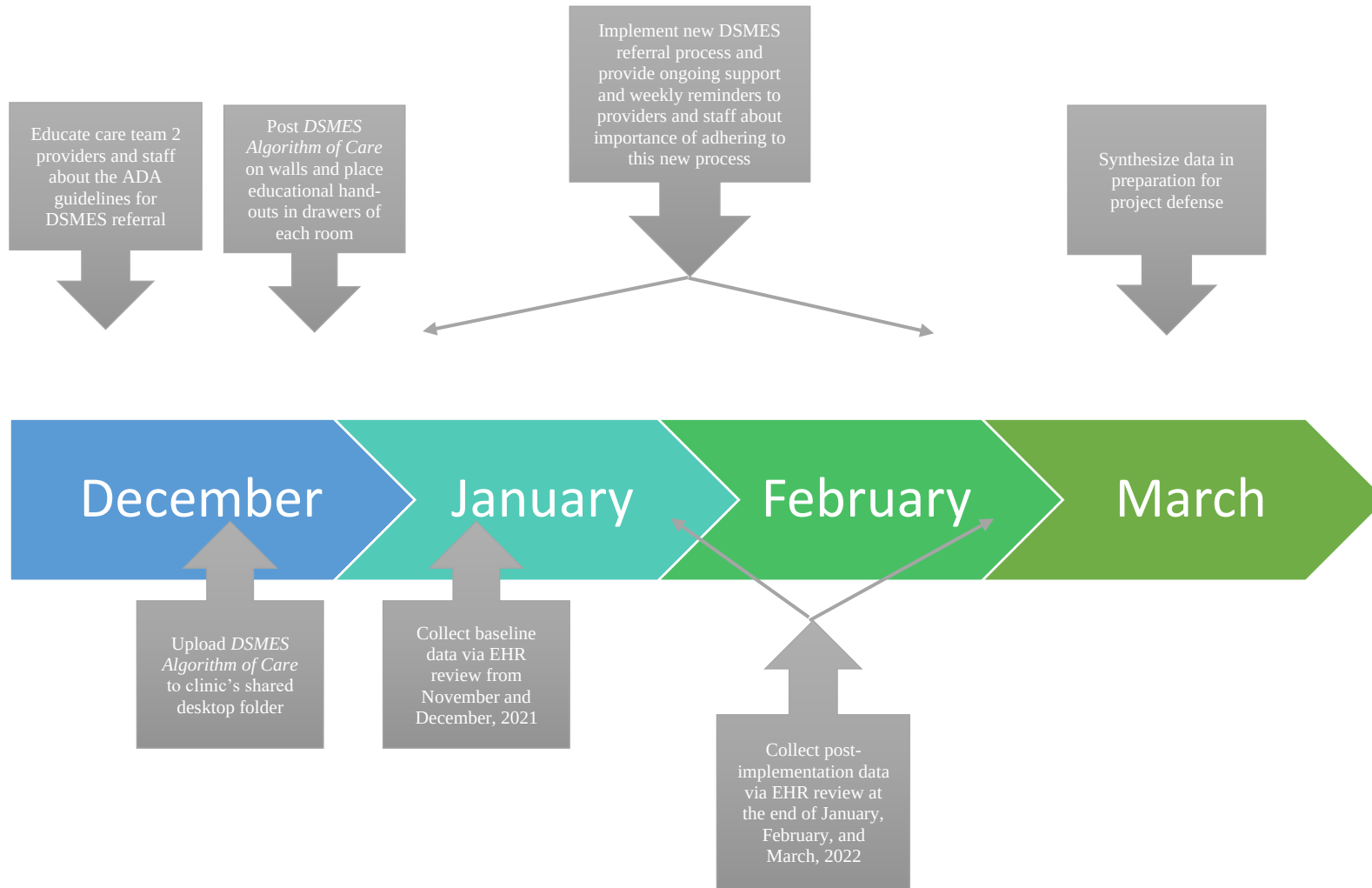
Figure 4: S.M.A.R.T. Goals



APPENDIX D

PROJECT TIMELINE

Figure 5: Project Timeline



APPENDIX E

OUTCOME MEASURES AND DATA ANALYSIS

Outcome Measures & Data Analysis

Table 1: Outcome #1 Data

Outcome #1 Data Collection		
<i>DSMES Algorithm of Care</i> uploaded to clinic share drive	Yes (on December 17 th)	
Staff demonstration of accessing referral algorithm	All 3 providers and 5 staff members of Care Team 2 successfully demonstrated accessing the algorithm before December 31 st	100% of providers and staff meet this objective

Table 2: Outcome #2 Data

Outcome #2 Data Collection			
<i>DSMES Algorithm of Care</i> posted on the wall in each exam room		Algorithm posted in all 6 exam rooms	100% of exam rooms meet this objective
Patient hand-outs containing diabetes nutrition/portion control education are available in the drawers of each exam room	January	All 6 exam rooms contain 10 copies of these patient handouts	100% of exam rooms meet this objective
	February	All 6 exam rooms contain 10 copies of these patient handouts	100% of exam rooms meet this objective

Outcomes 3-5 Data Collection

*Category 1 = patients with a new diagnosis of type 2 diabetes (T2DM)

**Category 2 = patients with an existing diagnosis of T2DM who met referral criteria (aside from new diagnosis) *and* who hadn't previously participated in DSMES

***Category 3 = patients with an existing diagnosis of T2DM who had established care with a DSMES program in the past and met criteria for follow-up

Table 3: Outcomes 3-5 November Data

November Data			
*Category 1		**Category 2	
Patients (#)	Referral sent (yes/no)	Patients (#)	Referral sent (yes/no)
1	Yes	1	No
		2	No
		3	No
		4	No
		5	No
		6	No
		7	No
		8	No
		9	Yes
		10	No
		11	No
		12	No
		13	No
		14	No
		15	No
		16	No
		17	No
		18	No
		19	No
		20	No
		21	No
		22	No
		23	No
		24	No
		25	No
		26	No
		27	No
		28	No
		29	No
		30	No
		31	No
		32	No
		33	No
		34	No
		35	No
		36	No
		37	No
		38	No
		39	No
		40	No
		41	No
		42	No
		43	No

Provider 1: no data
Provider 2: no data
Provider 3: 100%

Provider 1: 7.1%
Provider 2: 0%
Provider 3: 0%

Provider 1: 0%
Provider 2: 0%
Provider 3: 0%

Table 4: Outcomes 3-5 December Data

December Data					
*Category 1		**Category 2		***Category 3	
Patients (#)	Referral sent (yes/no)	Patients (#)	Referral sent (yes/no)	Patients (#)	Reminder given (yes/no)
1	Yes	1	No	1	No
2	Yes	2	No	2	No
		3	No	3	No
		4	No	4	No
		5	No	5	No
		6	No	6	No
		7	No	7	No
		8	Yes	8	No
		9	No	9	No
		10	No	10	No
		11	No	11	No
		12	No	12	No
		13	Yes	13	No
		14	No	14	No
		15	No	15	No
		16	No	16	No
		17	No	17	No
		18	No	18	No
		19	No	19	No
		20	No	20	No
		21	No	21	No
		22	No	22	No
		23	No	23	No
		24	No	24	No
		25	No	25	No
		26	No		
		27	No		
		28	No		
		29	No		
		30	No		
		31	No		
		32	No		
		33	No		
		34	No		
		35	No		
		36	No		
		37	No		
		38	No		
		39	No		
		40	No		

41	No
42	No
43	No
44	No

Provider 1: 100%
Provider 2: 100%
Provider 3: no data

Provider 1: 10%
Provider 2: 3.8%
Provider 3: 0%

Provider 1: 0%
Provider 2: 0%
Provider 3: 0%

Table 5: Outcomes 3-5 January Data

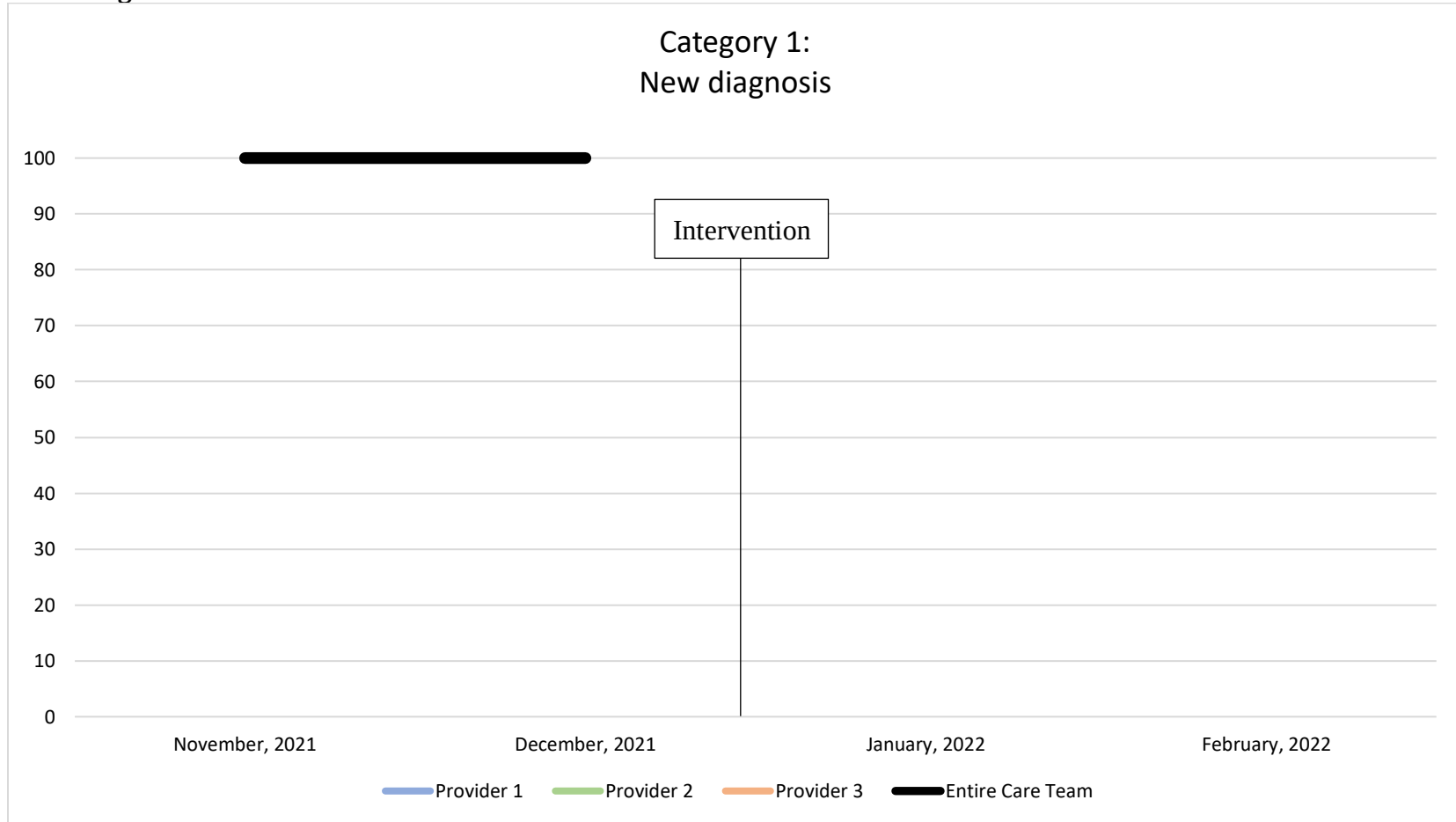
January Data					
*Category 1		**Category 2		***Category 3	
Patients (#)	Referral sent (yes/no)	Patients (#)	Referral sent (yes/no)	Patients (#)	Reminder given (yes/no)
None		1	No	1	No
		2	No	2	Yes
		3	Yes	3	Yes
		4	No	4	No
		5	No	5	No
		6	Yes	6	No
		7	No	7	No
		8	No	8	No
		9	Yes	9	No
		10	No	10	No
		11	No	11	No
		12	No	12	No
		13	No	13	No
		14	No	14	No
		15	No	15	No
		16	No	16	No
		17	No	17	No
		18	No	18	No
		19	No		
		20	No		
		21	No		
		22	No		
		23	No		
		24	No		
		25	Yes		
		26	No		
		27	No		
		28	No		
		29	No		
Provider 1: no data		Provider 1: 33.3%		Provider 1: 40%	
Provider 2: no data		Provider 2: 0%		Provider 2: 0%	
Provider 3: no data		Provider 3: 16.7%		Provider 3: 0%	

Table 6: Outcomes 3-5 February Data

February Data					
*Category 1		**Category 2		***Category 3	
Patients (#)	Referral sent (yes/no)	Patients (#)	Referral sent (yes/no)	Patients (#)	Reminder given (yes/no)
None		1	No	1	No
		2	No	2	No
		3	No	3	No
		4	No	4	No
		5	No	5	No
		6	No	6	Yes
		7	Yes	7	No
		8	No	8	No
		9	No	9	No
		10	No	10	No
		11	No	11	No
		12	No	12	No
		13	No	13	No
		14	No	14	No
		15	No	15	Yes
		16	No	16	No
		17	No		
		18	No		
		19	No		
		20	No		
		21	No		
		22	No		
		23	No		
		24	No		
		25	No		
		26	No		
		27	No		
		28	No		
		29	No		
		30	No		
		31	No		
		32	Yes		
		34	No		
		35	No		
Provider 1: no data		Provider 1: 10%		Provider 1: 14.2%	
Provider 2: no data		Provider 2: 0%		Provider 2: 0%	
Provider 3: no data		Provider 3: 20%		Provider 3: 33.3%	

Outcomes 3-5 Data Analysis

Figure 6



***Provider 3 had a 100% referral rate in November, and Providers 1 and 2 had 100% referral rates in December (these data plots are hidden by the trend line for the entire care team during the pre-implementation phase). There were no patients who met criteria for this category in either January or February, and therefore no data plotted for these months.**

Figure 7

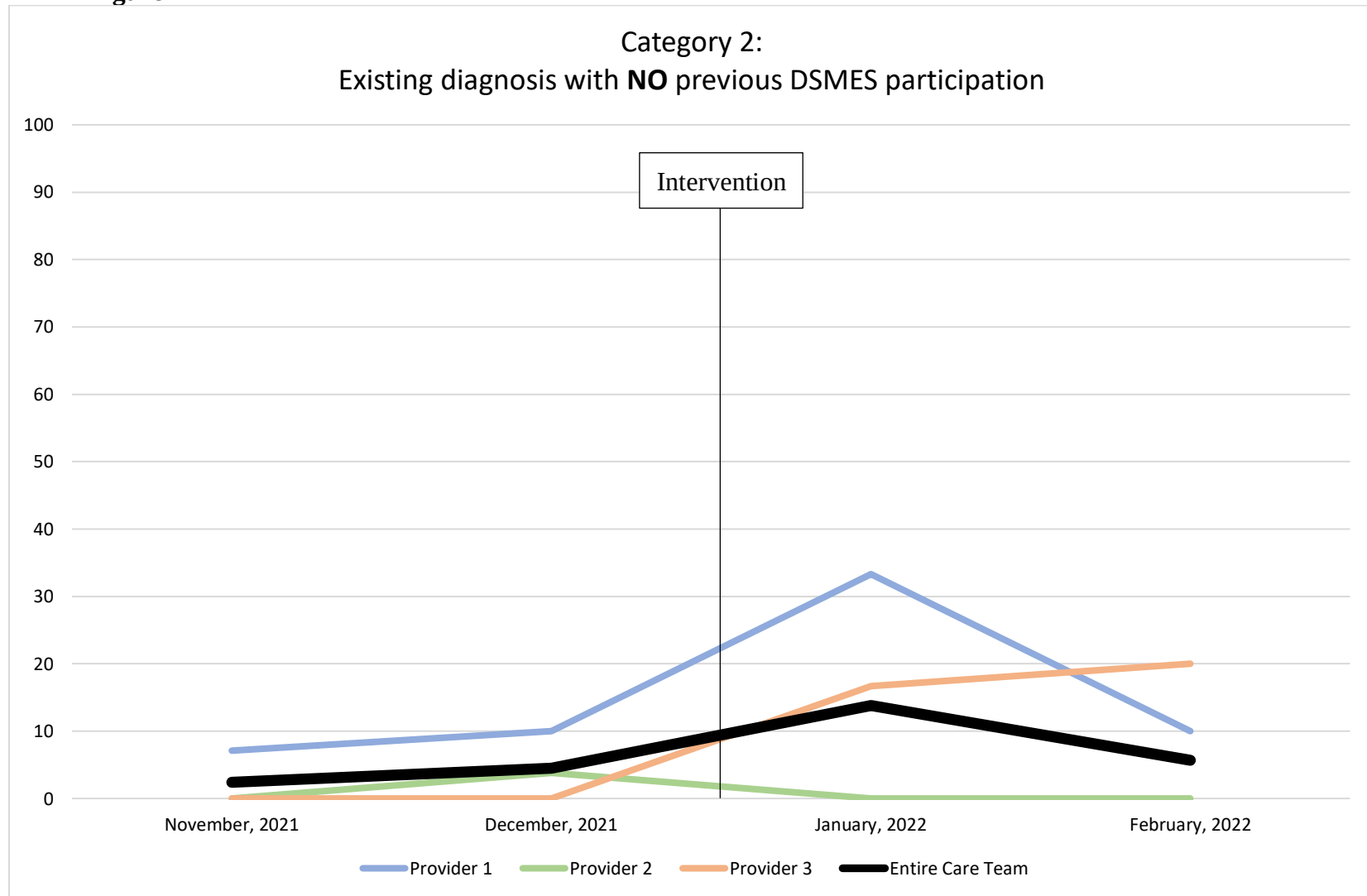


Figure 8

