

Doctor of Nursing Practice Project

Titled

Impact of Diabetes Self-Management Education on Adults with Diabetes and Mental Illness

by

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Abstract

Approximately 9.4% of the population of the United States, or 30.3 million Americans, has diabetes mellitus. Diabetes is the seventh leading cause of death and places a significant financial strain on the healthcare system with approximately \$327 billion in estimated expenditures. In Ohio, 13.5% of the population has diabetes, which represents a 4.1% increase above the national average. Additionally, individuals with mental illness are at an increased risk for diabetes due to lower self-efficacy and limited performance of self-care activities compared to the general population. This results in poor glycemic control and leads to an increased risk for diabetes complications. Approximately 46.6 million adults, or 19% of the population of the United States, have mental illness diagnoses. Diabetes Self-Management Education Support (DSMES) is recommended by the American Diabetes Association as an important aspect of diabetes care. The purpose of this evidence-based practice project was to implement a DSMES course to a group of adults with diabetes and mental illness to evaluate the impact on self-efficacy, performance of self-care activities, and hemoglobin A1C. This project was guided by the Self-Efficacy Model and the Iowa Model. There were six participants, five female and one male between the ages of 39-59, who attended the DSMES course. In addition to diabetes, all participants had at least one mental illness diagnosis, and four participants had two or more mental illness diagnoses. The DSMES course was taught 1 hour a week for 8 weeks online using Vidyo software. Participants completed The Diabetes Self-Efficacy Scale, and The Summary of Diabetes Self-Care Activities before and after the DSMES course to measure self-efficacy and self-care activities. The mean score for self-efficacy improved from 5.15 to 6.15 ($p=0.003$). Only one area of self-care activities, general diet improved from 3 to 5 ($p = 0.0003$). There were no other significant changes in other self-care activities. The change in A1C could not be

assessed due to restrictions related to COVID-19. Although a small sample, the implementation of a DSMES course for individuals with both diabetes and mental health illnesses may be beneficial in improving self-efficacy.

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Problem Statement

Globally, diabetes is one of the greatest health concerns of the century. According to the World Health Organization, diabetes combined with cardiovascular disease, cancer, and respiratory disease accounts for 80% of all premature deaths worldwide (World Health Organization, 2018). Adults with diabetes are at risk for developing serious complications including vision loss, heart disease, kidney failure, stroke, lower leg amputation, and premature death (*National Diabetes Statistics Report*, 2017). Approximately 8.4% of the world's population has diabetes (World Health Organization, 2018). In the United States, 30.3 million Americans, or approximately 9.4% of the population has diabetes (*National Diabetes Statistics Report*, 2017), and diabetes ranks as the seventh leading cause of death. In Ohio, 13.5% of the population has diabetes, which represents a 4.1% increase above the national average (*The Burden of Diabetes in Ohio*, 2019). In Lucas County the prevalence is 12% which is 2.6% above the national average. The most vulnerable populations in Lucas County with diabetes are persons over 65 years of age (28%), African Americans (23%) and those who make less than \$25,000 a year (21%) (*2016/2017 Lucas County Health Assessment*, 2017).

Diabetes places an enormous financial strain on the United States healthcare system. Approximately one of every four health care dollars is directly linked to diabetes care. The total estimated health expenditure is \$327 billion; and healthcare expenditure increased by 26% between the years of 2012 and 2017. This is attributed to the growing population of adults over the age of 65. This trend is expected to continue to rise as more people advance in age ("Economic Costs of Diabetes in the U.S. in 2017" 2018).

These statistics reflect data for both type I diabetes mellitus and type II diabetes mellitus (T2DM), although T2DM is much more prevalent. Of the 9.4% of adults who have diabetes in

the United States, 8.6% have T2DM (*National Diabetes Statistics Report*, 2017). Type I diabetes mellitus results from the destruction of pancreatic islet beta cells from an autoimmune process. In contrast, T2DM is the progressive loss of beta cell function due to genetic and environmental factors, with obesity being the most influential environmental factor that causes insulin resistance (Masharani, 2017). T2DM is diagnosed on the basis of one or more of the following criteria: 1) fasting blood glucose ≥ 126 mg/dl, 2) a 2-hour postprandial blood glucose ≥ 200 mg/dl in an oral glucose tolerance test, and/or 3) a glycosylated hemoglobin (A1C) of $\geq 6.5\%$ (American Diabetes Association, 2020).

A hemoglobin A1C lab result is used to assess and monitor the progression of diabetes. A1C reflects the average blood glucose over 120 days. Diabetes is diagnosed when the A1C reaches 6.5% and the patient is symptomatic. The higher the A1C, the greater the risk for complications associated with diabetes (Weatherby & Ferguson, 2002).

While diabetes is a well-known ongoing health problem in the general population, much less is known about the impact of diabetes in those individuals with a comorbid diagnosis of mental illness. According to the National Institute of Mental Health, mental illness is defined as a “mental, behavioral, or emotional disorder”. Mental illness can range from a mild impairment to a severe impairment. Approximately 46.6 million adults have a mental illness diagnosis. This represents 19% of the population of the United States (National Institute of Mental Health, 2019).

Serious mental illness (SMI) is a type of mental illness defined as “a mental, behavioral, or emotional disorder resulting in serious functional impairment, which substantially interferes with or limits one or more major life activities,” (National Institute of Mental Health, 2019).

Adults with SMI frequently have one or more of the following diagnoses: major depressive disorder, bipolar disorder, schizophrenia, schizoaffective disorder, or personality disorder.

Major Depressive Disorder is diagnosed when an individual suffers a depressive episode lasting at least two weeks. Some symptoms of major depressive disorder include depressed mood, loss of interest in activities, insomnia or hypersomnia, changes in weight or appetite, psychomotor retardation, thoughts of worthlessness, and recurrent thoughts of death or suicide (Coryell, 2020).

A patient with a diagnosis of bipolar disorder experiences periods of depression, in addition to periods of mania which can manifest as feelings of extreme euphoria, irritability, and/or impulsivity. There are two types of bipolar. An individual with bipolar 1 has mania, and an individual with bipolar 2 has a less intense form a mania also known as hypomania (Suppes, 2019). Those who have a diagnosis of schizophrenia experience chronic or recurrent psychosis with symptoms of hallucinations, delusions, and paranoia. Often it is associated with impairments in social and cognitive function (Fischer & Buchanan, 2020). Schizoaffective disorder is a combination of characteristics of schizophrenia, such as hallucinations, and characteristics of a mood disorder, such as mania and depression (Schizoaffective Disorder, 2020). Individuals with a personality disorder perceive and think about themselves and the environment differently. Displays of emotion and interpersonal behavior greatly deviate from other individuals within the same culture. Often these individuals have personality traits that are inflexible, maladaptive, and with the potential to cause significant stress and social impairment. (Skodol, 2020).

In the United States, approximately 1 in every 25 adults has SMI. Those with SMI are two to three times more likely to develop T2DM than the general population. It is estimated that 15% of people with SMI have T2DM, which is nearly 6% higher than the national average ("A

Practical Approach to Mental Health for the Diabetes Educator," 2018). According to the World Health Organization, adults with SMI die 10-25 years earlier than other average Americans without these types of diagnoses. This profound gap in life expectancy is mostly attributed to the frequent co-occurrence of chronic disease along with SMI. Mortality rates are twice as high among adults with diagnoses of schizophrenia and bipolar than the general population. In addition, adults with SMI are more likely to exhibit inadequate ability to manage chronic illnesses, such as diabetes. The prevalence of tobacco use is three times that of the general population, and adults with SMI are 50% more likely to be obese than the general population. Furthermore, symptoms of the mental illness can manifest barriers to seeking care and cause difficulty in following medical advice (World Health Organization, 2016).

The relationship between a chronic disease and SMI is complex and these two diagnoses can further impact each other. An individual with major depressive disorder (MDD) is at higher risk for developing diabetes; additionally, someone with diabetes is at higher risk to develop MDD. Once chronic illness has developed, an individual with a SMI diagnosis associated with poor self-care can lead to negative health outcomes and higher mortality rates. For example, an individual with MDD and diabetes is likely to have worsened depression because of factors related to diabetes; the same individual is likely to show depressive behaviors (poor diet, low activity, poor treatment adherence) that directly negate optimal diabetes management (Insel, 2011).

A contributor to the high risk for developing diabetes in individuals with a mental health illness is related to the use of psychotropic medications. Antipsychotics, antidepressants, and mood stabilizers are all considered psychotropic drugs with the potential to affect weight and/or blood glucose levels (Balhara, 2011). Of all the psychotropic drugs, antipsychotic medications

most often have the side effects of weight gain and insulin resistance. There are two main categories of antipsychotics: the “typical” or first-generation antipsychotics, and the “atypical” or second-generation antipsychotics. Typical antipsychotics include haloperidol and chlorpromazine, and atypical antipsychotics include risperidone, clozapine, olanzapine, and quetiapine (Balhara, 2011).

Antipsychotics are prescribed for the management of schizophrenia, schizoaffective disorder, or bipolar disorder. Atypical antipsychotics are prescribed as the first line of therapy because they have fewer extrapyramidal side effects (such as tremor, akathisia, and anxiety) when compared to typical antipsychotics. However, 78% of patients taking atypical antipsychotic medications experience a weight gain greater than 7%. Atypical antipsychotics are also associated with impaired glucose tolerance (Berg, Stajich, & Zdanowicz, 2012). Clozapine and olanzapine are the most likely to cause these side effects. Mood stabilizers used to treat bipolar disorder, such as lithium and sodium valproate, are also associated with impaired glucose tolerance and weight gain (Balhara, 2011).

An increased risk for weight gain and hyperglycemia has also been found in those who take selective serotonin reuptake inhibitors (SSRIs), selective norepinephrine reuptake inhibitors (SNRIs), and tricyclic antidepressants (TCA), all of which are common treatment options for depression and anxiety (Balhara, 2011). Medication induced weight gain and hyperglycemic effects of noradrenergic activity are possible causes of these reactions; however, the true mechanism is unknown (Balhara, 2011).

There is a great need for specific interventions to assist individuals with both T2DM and mental illness, as individuals with mental illness suffer disproportionately with diabetes than individuals without mental illness. Furthermore, individuals with mental illness and diabetes are

less likely to control diabetes and therefore experience higher costs related to poor health outcomes. Adults with mental illness and concomitant T2DM are at risk for higher A1C, poor medication adherence, increased emergency room visits, and greater frequency of hospitalizations than those with diabetes alone (Balhara, 2011). An important aspect of care management of diabetes is the ability to perform self-care activities (Shrivastava, Shrivastava, & Ramasamy, 2013). Recent study findings have shown that individuals with T2DM and mental illness had poor self-efficacy and performed significantly fewer self-care activities than those with T2DM alone (Chen, Chien, Kang, Jeng, & Chang, 2014; Mulligan et al., 2018). Evidence suggests outcomes for people with SMI and T2DM are improved by self-care management programs.

Diabetes self-management education and support (DSMES) is an integral aspect of care for individuals with diabetes. This evidenced-based intervention may impact self-efficacy, self-care activities, and A1C (Beck et al., 2017). DSMES can be delivered through provider and patient interaction, and it can be taught online or in-person in a group class. Adults who engage in DSMES demonstrate positive outcomes such as a 0.6% improvement in A1C, increased quality of life, reduction in hospitalizations and healthcare costs, increased self-efficacy, and increased performance of self-care activities (Beck et al., 2017). The American Diabetes Association (ADA) advises that all adults with diabetes participate in DSMES. This statement is made with the highest level (A) of recommendation (American Diabetes Association, 2020).

The curriculum for the DSMES course is provided by the Association of Diabetes Care and Education Specialists (ADCES), which was previously called the American Diabetes Association Educations (AADE). The ADCES has a framework known as the AADE7, and this framework guides the curriculum for the classes. The framework uses seven self-care activities

that have been identified as integral components to diabetes self-care management. The seven self-care activities are: healthy eating, being active, taking medication, monitoring blood glucose levels, problem solving, healthy coping, and reducing risks.

The purpose of this evidence-based practice (EBP) project was to implement a DSMES course to a group of adults with T2DM and mental illness to evaluate how it impacts self-efficacy, performance of self-care activities, and A1C. The AADE7 framework served as the core curriculum, and the project was guided by the Self-Efficacy Model and the IOWA model. The DSMES course focused on ways to improve self-efficacy and increase self-care activities, which is correlated with better glycemic control (as evidenced by A1C), improved health outcomes, and fewer healthcare costs.

Purpose and Goals of the Project

Purpose

The purpose of this evidenced based practice (EBP) project was to implement a DSMES class in a private outpatient psychiatric clinic to evaluate the impact on self-efficacy, self-care activities, and A1C among adults with T2DM and mental illness.

PICOT Question

This project was guided by the “PICOT” method. The term “PICOT” stands for *population, intervention, comparison, outcome, timeframe*. *Population* is the group that is studied, *intervention* is the intervention that is implemented, *outcome* is the what will be measured in the study, and *timeframe* is the time in which the study takes place (Dontje, 2007). The PICOT question for this EBP is: P) Among adults ages 18 and older with a diagnosis of type 2 diabetes mellitus and any mental illness diagnosis, I) how does participation in an 8-week

group DSMES course, C) compared to no DSMES course, O) impact self-efficacy, performance of self-care activities, and A1C levels T) at the end of an eight-week group DSMES course.

Goals and Outcomes

The goal of this EBP project was to evaluate the impact of a standardized diabetes education course on self-efficacy, performance of self-care activities, and A1C among adults with a diagnosis of diabetes and mental illness. Self-efficacy was measured with the Diabetes Self-Efficacy Scale (DSES), self-care activities were measured using the Summary of Diabetes Self-Care Activities (SDSCA), and A1C was obtained by chart review documentation of the most recent A1C. Repeat assessment of A1C was unable to be performed as contact with participants was restricted due to COVID-19.

Guiding Framework

The Self-Efficacy Model

The construct of self-efficacy was introduced by Bandura in 1977 as an important predictor of behavior change. Self-efficacy is defined as “people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (Bandura, 1994). Using this concept, Shortridge-Baggett and Van de Bijl (2001) developed a self-efficacy model to guide an intervention to improve self-efficacy among adults with T2DM. This self-efficacy model (Figure 1) served as the theoretical model that guided this EBP project.

The model evolves from the idea that the stronger the perception of self-efficacy one has, the more likely one will perform a desired behavior, and the firmer one's commitment will be to perform the behavior. The self-efficacy model operates under the premise that a person's expectations of mastery (self-efficacy) and success (outcome expectations) influence whether a

person will or will not perform a behavior. The outcome expectations can be influenced by social, physical, or self-evaluative effects (Van der Bijl & Shortridge-Baggett, 2001).

Self-efficacy is influenced by four sources. The four sources of self-efficacy are: performance achievement, vicarious experience, verbal persuasion, and self-evaluation of physiological and emotional states. Performance achievement is repeated mastery of an action or behavior. This is the most important source of self-efficacy because it acts upon the individual's own experiences. Experience of mastery and success increase self-efficacy, and experiences of failure decrease self-efficacy.

The second source, vicarious experience, is the observation of others. When observing others succeed, it makes the individual feel like he or she is more likely to succeed as well. This is most effective when the person succeeding has similar characteristics to the person observing, such as a peer.

Verbal persuasion is the third source. This involves verbally reinforcing that one has the capabilities to perform a behavior. This is the most common form of self-efficacy. To make this source more effective, the person giving persuasion should be credible and trustworthy.

The fourth source of self-efficacy is self-evaluation of physiological and emotional states. When one has a high amount of stress or anxiety about performing a behavior, this decreases self-efficacy. Individuals feel more successful when they do not have feelings of stress or anxiety. Identifying ways to reduce stress reactions and negative emotions is a way to strengthen self-efficacy (Van der Bijl & Shortridge-Baggett, 2001).

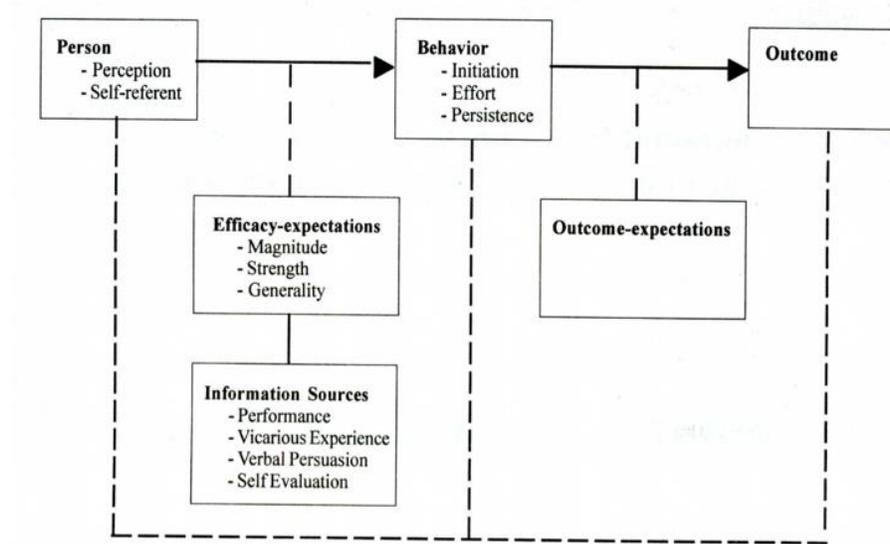


Figure 1: Self-efficacy model (Shortridge-Baggett & van der Bijl, 1996)

The Iowa Model

The Iowa Model was used to guide the implementation of this EBP project. Using an Evidence Based Practice (EBP) model is critical to successful EBP implementation, and the Iowa model is widely recognized for its applicability (Melnik & Fineout-Overholt, 2015). The Iowa model consists of seven basic steps. Step 1 is selection of a topic. This step identifies practice questions or “triggers” that come from questioning the current practice either by identifying a problem or gaining new knowledge. Step 2 is form a team. This step involves identifying stakeholders, as well as developing a project team. Step 3 is evidence retrieval. In this step, one conducts a literature search, reviewing the concepts and organizing evidence. Step 4 is grading the evidence. This step consists of critically appraising the collected evidence and synthesizing it. Step 5 is developing an EBP standard. In this step, one uses synthesized evidence to define a proposed practice change and develop an implementation plan. Step 6 is implement the EBP standard. In this step, the change is implemented in the practices setting. Step 7 is evaluation.

The results of the implementation of the practice change are evaluated, and conclusions and recommendations are developed with results of the study (Doody & Doody, 2011).

Review of The Literature

The review of the literature was completed to find literature about diabetes and mental illness, examine the relationship between T2DM and mental illness, and to identify interventions to improve self-efficacy, increase self-care among persons with T2DM and mental illness, and to improve A1C. The research articles were appraised and synthesized by the DNP student to identify an evidence-based intervention.

Search Strategies

The literature search was conducted using the following databases: Embase, CINAHL, Cochrane Database, PubMed, and Google Scholar. Search methods used keywords from the PICOT question. Keywords included: *diabetes, diabetes education, diabetes AND self-care, diabetes AND self-efficacy, diabetes class, diabetes class AND self-care, diabetes class AND self-efficacy, self-care, self-efficacy, diabetes AND intervention, diabetes AND self-care, diabetes AND self-efficacy, diabetes AND glycemic control, diabetes class AND mental illness, diabetes education, diabetes AND schizophrenia, diabetes AND schizoaffective, diabetes AND bipolar, diabetes AND anxiety, diabetes AND depression, and diabetes AND psychosis.* Inclusion criteria for the searches were full text articles, English language, quantitative or qualitative studies, and peer reviewed articles published within the past eight years. The search was conducted between August 2019 and November 2019. Articles were excluded if they were non-English, without a full text, and published prior to 2012. Dissertations and non-peer reviewed manuscripts were also excluded. A total of 22 articles were reviewed. An updated

search was conducted in September of 2020, and no new pertinent research articles were identified or added.

Critical Appraisal

A total of 22 articles were organized and placed into a synthesis table (see Appendix A), and underwent critical appraisal using the *Rapid Critical Appraisal of Evidence-Based Practice Implementation or Quality Improvement Products* (Melnyk & Fineout-Overholt, 2015), and the *Rapid Appraisal of the Systemic Reviews of Clinical Interventions* (Melnyk & Fineout-Overholt, 2015), (see Appendix B). The articles were next evaluated based on the Hierarchy of Evidence (see Appendix C), a tool that allows the user to rank a study from level I to level VII. Level I consists of systematic reviews of randomized control trials (RCTs). This level is a compilation of knowledge from multiple studies on the same subject. Level II is RCTs. Level III is for controlled cohort studies, which is a study in which a group of people with similar characteristics are assessed at specific periods, and no intervention or control group is utilized. Level IV is for uncontrolled cohort studies. Level V is for case studies, case series, qualitative and descriptive studies, EBP implementation and quality improvement projects. Level VI is the lowest level of evidence, and it is reserved for expert opinion (Melnyk & Fineout-Overholt, 2015). While identifying which level of evidence each article is, it is important to determine the quality and strength of that evidence. The Grading of Recommendations Assessment, Development and Evaluation (GRADE) tool (Appendix D) was used to grade the strength of the evidence. This tool ranks an articles strength from “high” to “very low.” The ratings are given based both on what level of evidence a research article is, but it also adjusts for risk for bias, publication bias, and inconsistencies (Ryan & Hill, 2016). After appraising the quality of the evidenced based on

this tool, all articles were found to have either high quality (14 articles) or medium quality (8 articles).

Evidence Synthesis

Of the 22 articles, 12 were systematic reviews and RCTS that used diabetes education as the intervention. All 12 articles demonstrated improvement in either one or more of the following: self-efficacy, self-care behavior, or A1C. (Chrvala, Sherr, & Lipman, 2016; Copsey, Abate, & Zucconi, 2014; Felix et al., 2019; He et al., 2017; Hildebrand et al., 2019; Hwee, Cauch-Dudek, Victor, Ng, & Shah, 2014; O'Donnell et al., 2018; Ose et al., 2019; Pillay et al., 2015; Reisi et al., 2017; Rygg, Rise, Grønning, & Steinsbekk, 2012; Shrader, Martin, & Cogdill, 2013).

Hwee et al (2014) found that a group DSMES course demonstrated better outcomes than individual counseling. This was a population-based cohort study that identified 77,824 people in Ontario, Canada who participated in a diabetes education program. Participants were divided into three groups: those who attended group class (12,234), those who attended individual counseling (55,761), and those who did both (9,829). The findings demonstrated that those who attended group classes were less likely to have emergency room visits or hospital admissions for either hyperglycemia or hypoglycemia. The individuals who attended the group classes were also more likely to have adequate A1C testing (Hwee et al., 2014).

Two studies determined that more than 10 contact hours of DSMES intervention time was needed to demonstrate significant results ($p = 0.01$) (McElfish et al., 2019; Pillay et al., 2015). Another study had conflicting results as they demonstrated positive outcomes with a one-hour class. This quasi-experimental study by Copsey et al., (2014) provided a one-hour diabetes education class to 94 inpatients admitted to the hospital for diabetes-related complications. None

of the study participants were re-admitted to the hospital for a diabetes complication within three months after class attendance.

Self-Efficacy, Self-Care, and A1C

Reisi et al, (2017) evaluated a theory-based diabetes education course. The intervention consisted of five group sessions and one individual counseling session. Results of the study showed a significant difference in self-efficacy and performance of self-care activities in the intervention group ($p < 0.01$). There was a 0.4% decrease in A1C which was statistically significant ($p < 0.05$) at 6 months after the program completion in the intervention group (Reisi et al., 2017).

Chen et al, (2014) specifically compared those with T2DM and mental illness ($n = 105$) to those with T2DM alone ($n = 106$). Results showed that those with T2DM and mental illness had significantly lower self-efficacy scores ($p < 0.001$) and performed fewer self-care activities than those with just T2DM. Mulligan et al. (2018) administered the Summary of Diabetes Self Care Activities (SDSCA) and a self-efficacy survey CORE-10, to 77 adults with T2DM and mental illness. Findings suggested that diabetes self-care management is poor among this population. The authors indicated a need to improve self-efficacy and self-care activities among this population.

Self-efficacy has been found to be a predictor of both self-care activities and glycemic control. A cross-sectional study of 570 adults with T2DM identified self-efficacy as the most important factor in glycemic control, which was defined as A1C $< 7\%$ (Venkataraman et al., 2012). Four studies showed a positive relationship between self-efficacy and performance of self-care activities (Alvarado-Martel et al., 2019; Amer, Mohamed, Elbur, Abdelaziz, & Elrayah, 2018; Gurmu, Gela, & Aga, 2018; Tharek et al., 2018). McBain et al (2016) assigned 52 people

with T2DM and mental illness to a 24 week in-person Diabetes Awareness and Rehabilitation Training (DART) program and then compared it to usual care. The DART program focused on increasing self-efficacy and knowledge. After the program, 52 participants had an increase in self-efficacy and knowledge. There was a sustained significant decrease in A1C at 12 months after the DART class. The average A1C in the intervention group was 6.9% compared to the usual care group which was 7.9% (McBain et al., 2016).

A meta-analysis of 132 randomized control trials comparing DSMES programs to usual care, evaluated different program structures to identify the effects on glycemic control. The meta-analysis found that the studies with DSMES in-person group courses greater than 10 contact hours achieved higher reductions in A1C, about 0.4%. In general, individuals with suboptimal glycemic control experienced greater benefits from group DSMES programs than those with good glycemic control (Pillay et al., 2015). A systematic review of 18 studies identified an average of 0.25% reduction in A1C in the DSMES intervention group compared to usual care (Hildebrand et al., 2019). A randomized study of 146 adults with T2DM identified no significant reduction in A1C, however, between the DSMES intervention and the control group, the control group had an average increase in A1C of 0.3% (Rygg, Rise, Grønning, & Steinsbekk, 2012). A randomized control trial had two groups: one group (n = 30) attended a four class DSMES course, and a control group (n = 30) who did not attend a DSMES course. The A1C was measured pre intervention, and again three months post intervention. There was clinically significant mean decrease in A1C of 1.1%; however, this change was not statistically significant (Shrader, Martin, & Cogdill, 2013).

The curriculum of the DSMES course is provided by the ADCES. This curriculum is constructed from seven self-care activities needed to maintain health with diabetes and is also

referred to as the AADE7. Zheng et al (2014) conducted a two phased, one group, mixed method design study that evaluated the results of a DSMES course using the AADE7 as the curriculum. The total course was taught every other week for 16 weeks, eight classes in total. Each class met for 1 hour, and included lecture and discussion, and followed the eight classes of the AADE7 curriculum. The Summary of Diabetes Self Care Activities survey (SDSCA) was used to evaluate the program at baseline and after the intervention. There were significant improvements in knowledge and performance of self-care activities.

Recommended Practice Change

The American Diabetes Association (2020) recommends provider participation in DSMES as either engagement in individual counseling or referral to a group class. DSMES has shown to improve patient self-management, satisfaction, and A1C (American Diabetes Association, 2020). DSMES facilitates the knowledge and skills required to promote self-management of diabetes. These services are an important and necessary resource for those with both T2DM and mental illness, as individuals with both diagnoses often have suboptimal self-efficacy and perform fewer self-care activities. The evidence supports a group DSMES course to improve self-efficacy, increase self-care activities, and improve A1C at the private outpatient psychiatric clinic in Northwest Ohio.

Methods

Project Setting

The setting for this EBP project was initially designed to take place at a local outpatient psychiatric clinic in Northwest Ohio. Due to restrictions related to COVID-19, this EBP project could not be conducted in-person and was transitioned to an online platform utilizing a video conference software called Vidyo.

The setting for the recruitment of participants for this EBP project was a private outpatient psychiatric clinic in Northwest Ohio. All participants were established outpatients at this clinic. The clinic manages over 23,000 adults and adolescents on an annual basis. The private clinic offers a wide variety of services including individual and group mental health counseling, psychiatric evaluation, medication management, primary care, wellness education, addiction medicine, ambulatory detoxification, and Employee Assistance Programs for local businesses. The clinic has multiple locations in three counties, and accepts many insurances including Medicare and Medicaid ("About," 2019).

The Whole Health for You (WHY) committee is an interprofessional committee at this private outpatient psychiatric clinic. Members include: a project director, an integrated care coordinator, a primary care nurse practitioner, a nurse care coordinator, a care manager, a peer wellness coach, as well as administrative support staff. The WHY committee offers many grant funded health promotion classes to clinic participants. The grant supports instructors and allows for classes to be free to the participants. The grant provides incentives, such as \$5 gift cards and bus tokens, to participants who attend the classes.

Typically, all classes offered by the WHY committee are taught in-person at the clinic, however due to COVID-19 challenges, all WHY classes were canceled from March 2020 through May 2020. In June 2020 the WHY transitioned to an online platform for class delivery. Also, during March 2020 through June of 2020 the DNP student was restricted from all participant contact and thus explored the ability to convert the EBP project to an online delivery method. All preplanned in-person content was repurposed into a PowerPoint format for online delivery. The course was delivered virtually using Vidyo, a video conference software program.

Participants joined the online course from their own homes using tablets provided by the outpatient psychiatric clinic. Classes took place from July 2020 to August 2020.

The Iowa Model

The Iowa Model is an evidenced based framework used to guide the implementation of evidence into practice (Titler, et. al). The Steps for the Iowa Model are: selection of a topic, form a team, evidence retrieval, grading the evidence, developing and EBP standard, implement the EBP, and evaluation (Doody & Doody, 2011).

Step 1: Selection of a Topic

Those with T2DM and mental illness are at greater risk for complications of diabetes. This is related to poor self-efficacy and suboptimal performance of self-care activities (Mulligan et al., 2018; "A Practical Approach to Mental Health for the Diabetes Educator," 2018). This is a problem for those with T2DM and mental illness because increased complications lead to poor health outcomes and increased health care costs. Self-efficacy is positively related to an increase in performance of self-care activities. Performance of self-care activities is related to good glycemic control and decreased complications of diabetes (Shrivastava et al., 2013).

Step 2: Form a Team

The DNP student formed a team with project committee members to propose and implement this EBP project. The project team was comprised of the DNP student and the project committee, which included Dr. Eileen Walsh as the project chair, and Drs. Robert Topp and Deloris Lakia as committee members. In July 2020, Dr. Lakia retired, and Dr. Tonya Schmitt joined as a committee member.

At the project site, the DNP student facilitated meetings with members of the WHY committee to discuss possible solutions to improving self-efficacy and self-care activities among

outpatients at the clinic with mental health illnesses. The DNP student conducted a thorough review of the research to identify an evidence-based solution, the DSMES class. The WHY committee assisted the DNP student in implementing this project.

The WHY committee consists of an interprofessional health care team who teach health promotion and education classes. Grant funding supports instructors, and all the classes are free to the participants. The role of the WHY committee in this EBP project was to facilitate project implementation by advertising the DSMES course to participants in other WHY classes, provide the DNP student with a class time block, and access to the Vidyo software. The role of the primary care nurse practitioner on the WHY committee was to assess and refer appropriate patients to the DSMES course. The role of the DNP student was to identify an evidenced based practice to address the clinical problem (a DSMES course), develop the course materials, and teach the course. The WHY committee was eager to incorporate a DSMES course as part of their comprehensive outpatient psychiatric services. The WHY committee served as a strong stakeholder for this EBP project.

Step 3: Evidence Retrieval

Evidence retrieval began with an extensive literature search aided by the PICOT question. A total of 22 articles was selected for evaluation and appraisal. A more detailed account of the literature review can be found in the “search strategies” section.

Step 4: Grading the Evidence

A synthesis table of the 22 articles was created to identify the positive benefits and feasibility of implementing a group DSMES course to adults with both T2DM and mental illness. Each article underwent critical appraisal using Melnyk and Fineout-Overholt (2015) rapid critical appraisal form. The articles were evaluated based on the Hierarchy of Evidence, a

tool that allows the user to rank a study from level I which includes systematic reviews, to level VII which is expert opinion (Melnik & Fineout-Overholt, 2015).

Step 5: Developing an EBP standard

A synthesis of literature showed that the evidence supports a group DSMES course. DSMES is an integral aspect of care for persons with diabetes. It is defined as “the ongoing process of facilitating the knowledge, skills, and ability necessary for diabetes self-care, 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” (Beck et al., 2017). The course featured a curriculum by the ADCES and was taught 1 hour a week for 8 weeks. The DSMES course was taught by the DNP student. According to the DSMES guidelines, any licensed healthcare professional can teach this class (Beck et al., 2017). The DNP student is a registered nurse licensed in the state of Ohio. The DNP student has had more than 4 years of experience working with individuals in an inpatient psychiatric unit.

Step 6: Implement the EBP standard

The EBP standard is a theory-based DSMES course guided by the Self-Efficacy theory that contains the recommended core-curriculum of the AADE7 (Beck et al., 2017). The sources of self-efficacy derive from four main attributes: performance accomplishments, vicarious experiences, verbal persuasion, and self-evaluation of physiological and emotional states. The curriculum was guided by these sources (Van der Bijl & Shortridge-Baggett, 2001). Performance accomplishments is the most important source of self-efficacy (Van der Bijl & Shortridge-Baggett, 2001). The DSMES course used goal setting with each class to increase performance accomplishment. The second source of self-efficacy, vicarious experience, was incorporated by selecting role models within the class who exhibited good behaviors. These role

models were featured in class conversations to talk about meeting goals and performing self-care activities. Verbal persuasion, the third source of self-efficacy, was accomplished by giving positive reinforcement to participants as they achieved their goals. Self-evaluation of physiological and emotional states is the final source of self-efficacy. Anxiety, depression, and poor emotional state can negatively affect self-efficacy. The DNP student promoted a positive environment and implemented coping skills into class. This helped to decrease anxiety and distress over performing self-care activities.

A recent study showed that individuals with mental illness were just as motivated as the general population, however, there were some barriers and special considerations that needed to be addressed when working with this population. (Hempler, et al., 2018). Barriers included information overload, one-way communication, and a teaching style that failed to address the needs of the population. Students were able to take in most information when the educators spoke less, were responsive, attentive, and engaged the students in activity (Hempler, et al., 2018). The DSMES course taught by the DNP student was delivered using special considerations for adults with a mental illness diagnosis. These special considerations included active listening, interactive activities, and open-ended questions to facilitate participant engagement. The full implementation of the EBP is described in the “Implementation Process” section.

Step 7: Evaluation

The evaluation of this EBP project was directed at the outcome measures identified the PICOT statement. The outcome measures were self-efficacy, performance of self-care activities, and A1C. The Diabetes Self Efficacy Scale (DSES) and the Summary of Diabetes Self Care Activities (SDSCA), were administered prior to the beginning of Class 1 and at the completion of Class 8 to measure self-care activities and self-efficacy, respectively. Pre intervention and post

intervention scores were compared using a paired t-test. Results are provided in the section titled “project results”. A pre intervention A1C was obtained from chart review. A post intervention A1C was planned at the final class if on site as point of care A1C. Repeat assessment of A1C was unable to be performed as contact with participants was restricted due to COVID-19.

All DSMES course materials and results of the EBP project were shared with the WHY committee. As of the end of the last group class in August 2020 the WHY committee planned on renewing this DSMES course for the Fall. The WHY committee planned to use the same materials and PowerPoints developed by the DNP student using the ADCES curriculum.

Implementation Process

Sample

The sample for this EBP project included all individuals who met the following eligibility criteria: 1) at least 18 years of age, 2) diagnosis of T2DM, 3) mental health diagnosis listed in the DSM-V, 4) informed consent from participant, 5) willingness to complete a survey at Class 1 and Class 8, 6) ability to read English. Participants who completed pre and post DSMES course intervention surveys were included as the final sample.

Potential participants were identified when being seen for a medical appointment with the primary care nurse practitioner at the outpatient psychiatric clinic. The primary care nurse practitioner referred individuals to the DSMES course, and interested individuals signed up for the DSMES course. Potential participants who regularly attend WHY programs at the clinic were notified via email of the DSMES course, and individuals who were interested in attending signed up. A total of 12 individuals signed up for the DSMES course. The DNP student attempted to contact all 12 participants. Eight individuals agreed to participate in the study. The DNP student called and emailed the other four individuals; however, the DNP student was not able to make

contact. Of the eight that agreed to participate in the project, on further review, one individual was deemed ineligible for the EBP project as there was no diagnosis of diabetes. Another individual attending the DMSES course and other WHY program classes was suspended from all WHY classes for 30 days due to poor class etiquette and disruptive class behavior. This individual was excluded from further participation in the DSMES course.

Implementation Plan

The DNP student completed CITI training to understand the conduct of research with human subjects. The EBP project was submitted to the University of Toledo's Institutional Review Board (IRB) for expedited review in April of 2020. The original IRB application had to be modified to accommodate an online delivery method for the DSMES course as the WHY committee was mandated to suspend all in-person classes in March of 2020. Classes were not able to be resumed until June of 2020. The EBP project was modified and approved by the IRB in June of 2020. The full project timeline can be found in Appendix E.

Once IRB approval was obtained, the DNP student began contacting potential participants to discuss the project and informed consent. The DNP student was restricted from meeting the potential participants in-person due to COVID-19. Thus, the DNP student spoke with the potential participants by phone and asked permission to mail two copies of the informed consent along with a prepaid postage return envelope. Once the potential participants received the informed consent form in the mail, the participant called the DNP student. At that time the DNP student discussed the EBP project, reviewed informed consent with both the participant and witness, and answered all questions. The participant signed one copy of the informed consent form and mailed it back to the DNP student in the prepaid postage return envelope. Each participant kept the second copy of the informed consent form.

The next step in the EBP project was to have all the participants complete a demographic data sheet (see Appendix F). The DNP student conducted a chart review to obtain medical history data (Appendix G). Participants were asked to complete the DSES (Appendix H) and the SDSCA (Appendix I). The DNP student was restricted from meeting the participants in-person, so demographic data, DSES, and SDSCA were entered into an online survey software through Qualtrics. Links to each individual survey were either emailed or texted (whichever participant specified) to the participant. Each participant was given a unique participant code number, and the survey data was entered into an excel spreadsheet using the unique participant code number. The DNP student reviewed each participant's medical chart at the outpatient psychiatric clinic to complete the medical history data sheet which included the year diagnosed with diabetes, current A1C, comorbidities, psychiatric diagnosis, and current medications. This information was then entered into the excel spreadsheet.

The DSMES course began on July 1, 2020 and ended on August 19, 2020. At the end of the 8-week course, the participants were again reminded via email or text about the Qualtrics link to the DSES and the SDSCA. This data was entered into the excel spreadsheet.

Intervention

The evidenced based intervention in this project was a DSMES course consisting of eight 1-hour classes. The curriculum for the course is based on a standardize curriculum provided by the ADCES. The ADCES published the curriculum in an instructional book, which was used by the DNP student to teach this class. This book is called *Diabetes Education Curriculum* (2016). Each class is based on one of the AADE7 activities: healthy eating, physical activity, taking medication, monitoring, problem solving, healthy coping, and reducing risks. The first class consisted of education on all seven activities, and an introduction to what diabetes is and how it

is diagnosed. See Appendix J for AADE7 class material. Each of the subsequent seven classes focused on one behavior as the topic of that class (Austin et al., 2016). All seven of these self-care activities were featured as the topic and have been shown to reduce diabetes complications in adults with diabetes (Shrivastava et al., 2013).

Class 1: Introduction to Diabetes and Prediabetes

The introduction to diabetes and prediabetes class began with an interactive ice breaker followed by an open discussion of participants' thoughts and feelings towards diabetes. The DNP student provided a review of basic diabetes pathophysiology and the decisions a healthcare practitioner uses to make the diagnosis. A lesson on goal setting was discussed because goal setting is a method to fulfill performance achievement, which is a source of self-efficacy in the self-efficacy model. This class concluded with an introduction to the AADE7 self-care activities and a brief explanation of how the remainder of the course would proceed, followed by discussion and questions (Austin et al., 2016).

Class 2: Healthy Eating

This Healthy Eating class began with the participants discussing their feelings about healthy eating and their thoughts or concerns about their current diet. This was followed by education on basic nutrients: protein, fat, carbohydrates, vitamins, and minerals. The importance of protein, fat, and carbohydrates and their effect on the body was discussed, as well as proper portion of each. Emphasis was placed on carbohydrates, carbohydrate portions, glycemic index, and how all of this affects blood glucose. After a lesson on reading food labels, a carb counting activity, a meal planning activity, and an activity in which class participants chose a healthy meal at their favorite restaurant was conducted to foster engagement and learning. One participant had recently lost 25 pounds. This participant was asked to speak about the methods used to lose

weight. By having one participant speak about successfully losing weight, this had the potential to give the other participants vicarious experience: when they see a successful peer, it makes the task of losing weight and eating healthy more attainable. Vicarious experience is a source of self-efficacy. The participants were taught how to set goals, and each participant set a realistic nutritional goal for the following week. Goal setting is an effective way to assist participants in performance achievement. The class concluded with discussion and questions (Austin et al., 2016).

Class 3: Being Active

The Being Active class began with a review of the nutritional goals from the previous class. During this class, all participants met their goal set the week prior. Each participant spoke about what the goal was and how it was met. The DNP student gave verbal reinforcement and encouraged each participant to continue setting and meeting goals; this exhibited verbal persuasion, and further promoted self-efficacy. To start the main topic of the class, the participants discussed their understanding of and interest in physical activity. This was followed by a discussion of different types of physical activity and the benefits of each: aerobic, resistance, flexibility, and balance. A structural approach to physical activity was reviewed, which consisted of frequency, duration, and intensity of a recommended physical activity. Participants who currently exercised 30 minutes a day were asked to discuss their methods to promote vicarious experience. Hypoglycemia, the importance of timing of physical activity in relationship to hypoglycemia, and snacks to eat in case of hypoglycemia were discussed. Class activities included building a strength circuit that participants could do at home using everyday household objects (such as water bottles and soup cans for weights and using a chair for exercises). The class concluded with written physical activity goals, and a discussion on how

these goals could be met, and the DNP student answered questions. Physical activity logs were emailed to all participants to assist with physical activity goal setting. (Austin et al., 2016).

Class 4: Taking Medication

The Taking Medication class began by reviewing nutritional and physical activity goals from previous classes. Participants who met goals spoke to meeting each goal. All participants were encouraged to continue setting goals and meeting goals. Participants discussed their thoughts, concerns, and barriers towards taking medications. The DNP student discussed the need for medication and described specific oral and injectable medications for diabetes. Each participant shared the type of diabetes medications they were taking. The DNP student reviewed the basic properties, side effects, and special considerations for the medication. Participants shared methods that assisted them in remembering to take their medication. The DNP student discussed the importance and timing of blood glucose monitoring and further discussed signs and symptoms of hypoglycemia. The storage and care of insulin, prepping and taking an injectable, mixing insulin, side effects, and needle disposal were also discussed. The DNP student spoke about psychotropic medications, and how these medications can contribute to weight gain and insulin resistance. The DNP student emphasized that although individuals who take psychotropic medications are at higher risk for developing diabetes, diabetes, can be managed very well by taking medications, eating healthy, and engaging in exercise. Participants discussed three of these activities that were most difficult to do and how to improve this activity. The class concluded with discussion, questions, and goal setting (Austin et al., 2016).

Class 5: Monitoring

The Monitoring class began with a discussion of progress towards goals and, how participants met their goals. The participants discussed their feelings and barriers towards taking

their blood glucose. The DNP student discussed the benefits of monitoring blood glucose and blood glucose targets. General guidelines regarding control testing, storage of supplies, traveling with supplies, hygiene, alternative site testing, disposal of lancets, how to get an adequate sample, and recording results were explained. One participant who attended this class needed to obtain their blood glucose four times a day. The participant was able to identify personal barriers and how the participant was able to overcome these. In addition to monitoring blood glucose, the DNP student reviewed monitoring for diabetic complications that affect the eyes, kidneys, and feet. Class activities included a critical thinking game in which participants responded to scenarios with varying blood glucose levels. Participants reviewed target levels along with their ideas and behaviors in managing those levels. The DNP student reviewed how to take blood glucose using a glucometer. Participants set goals for the following week, and the DNP student answered questions (Austin et al., 2016).

Class 6: Problem Solving

The Problem Solving class began with discussion of progress towards goals and how participants met their goals. The DNP student discussed different problem solving skills by conducting interactive activities with problem scenarios. The DNP student reviewed signs and symptoms of hypoglycemia and hyperglycemia and identified methods to correct these problems. The DNP student reviewed situations where blood glucose must be closely monitored, such as when an individual is sick. Sick-day guidelines, including how blood glucose is affected when sick, how to monitor blood glucose while sick, and what to eat and drink to prevent complications were also discussed. Participants were encouraged to share situations where they faced a problem and how they solved the problem. Participants were asked to share current problems they were experiencing, and the class participants identified ways to assist in solving

their problems. Participants were encouraged to set a goal for the following week, and the DNP student answered questions (Austin et al., 2016).

Class 7: Healthy Coping

The Healthy Coping class began with discussion of goal progress, and participants shared the goals they meet. The participants discussed their thoughts and feelings of living with diabetes. This was followed by a discussion of different response types to bad news such as, shock/denial, anger/resentment, guilt/self-blame, and sadness/depression and how to cope with these responses. Coping skills for clinical depression and anxiety were reviewed. Participants shared their personal struggles and experiences with anxiety and depression, and they shared successful coping skills. Emotional signs and symptoms of stress were discussed. The DNP student explained physiologic signs and symptoms of stress, such as high blood pressure, weight gain, and others, and how these symptoms can negatively affect health. Participants talked about ways they deal with stress, and the DNP student discussed activities that have been shown to decrease stress. Participants identified new coping skills they could use. Self-evaluation of physiological and emotional states is the final source of self-efficacy. It is difficult to have self-efficacy if one has depression, anxiety, or stress related to the behavior. This class assisted the individuals in recognizing their feelings and identify coping skills to help them feel emotionally ready in managing their diabetes. Participants were led through a five-minute meditation session. The class concluded with discussion, questions, and goal setting (Austin et al., 2016).

Class 8: Reducing Risks

The Reducing Risks class began with discussion of goal progress. The participant shared personal experience with diabetes complications. Several methods to reduce risks in the following areas were discussed: cardiovascular health, kidney health, eye health, nerve health,

sleep health, dental health, and skin health. The DNP student spoke with the participants about current complication management strategies. The DNP student reviewed the current standard of care for health maintenance and promotion of adults with diabetes. The class concluded with reflection of the course and final questions (Austin et al., 2016).

Barriers and Facilitators

There were several barriers that impacted participant recruitment and project implementation. Recruitment for the class was made primarily by the nurse practitioner and the WHY committee. During the Spring, there was a six-week period in which the outpatient psychiatric clinic was completely shut down, and patient appointments were made for telehealth only. This contributed to a poor class sign up rate, both to the DSMES class and other WHY programs. In addition, many patients declined to sign up for the class due to a virtual online format. Once the list of potential class participants was given to the DNP student, it was difficult contacting all potential participants for consent. A total of 12 participants signed up for the class, and only eight could be contacted. The four participants that could not be reached were also absent to the full DSMES course. Of the participants that did attend class, several had poor attendance rates, and each participant attended on average four classes. One participant said “Sometimes I just forgot to come to class because it was online, and usually I have to remember to drive to class to go somewhere. Because I didn’t have to drive anywhere, I just forgot”. There were also several technical disruptions to class that may have been a barrier to information delivery. These technical problems included participants not muting their microphones when not talking, feedback, background noise, and software malfunctions in which participants were “kicked out” of the room.

The WHY committee and private outpatient psychiatric clinic were strong facilitators of this EBP project. The project site provided approval to the DNP student in the form of a letter after meeting with the director of nursing at the clinic (see Appendix K). The primary care nurse practitioner, a member of the WHY committee, assisted with referring patients with diabetes to the DSMES class. Administrative staff of the WHY committee advertised the class to participants in other WHY programs in the form of an email. Additionally, as a facilitator, the outpatient psychiatric clinic provided patients with tablets for telehealth visits and WHY program classes. Four of the six participants in the EBP project used these tablets during the DMSES course. Without these tablets, there may not have been as many participants.

Outcome Measures

Outcome measures were assessed using the Diabetes Self-Efficacy Scale (DSES) and the Summary of Diabetes Self-Care Activities (SDSCA). An A1C was planned as an outcome measure. A pre-intervention A1C was obtained through chart review, however due to restrictions related to COVID-19, reassessment of A1C could not be obtained.

Diabetes Self-Efficacy Scale

The Diabetes Self-Efficacy Scale (DSES) is an eight-item questionnaire that measures self-efficacy. The DSES was originally developed in Spanish and later translated to English. The internal consistency for the English DSES had Cronbach alphas that ranged from .828 to .882 among two groups in three different studies, which showed good reliability. The initial scores of the DSES were associated with baseline behaviors. Improvements in DSES scores were strongly correlated with an improvement in health outcomes and behaviors, which suggested good construct validity. The DSES scale was determined to have good convergent validity based off of high item-scale correlations (Ritter et al., 2016).

The DSES is free to use without additional permission. The participant responded to each item using a rating scale from 1 to 10 with 1 being not confident at all, to 10 being totally confident. The total score ranges from 8 to 80, with the mean score used to interpret the level of self-efficacy. If more than two questions are missed, the scale cannot be scored. The higher the score, the higher the self-efficacy. The mean score is 6.87. For this EBP project, participants who scored lower than 6.87 were determined to have low self-efficacy, and those who score higher than 6.87 were determined to have high self-efficacy (Ritter, Lorig, & Laurent, 2016). Scoring for the DSES was based on the scoring instructions. The final score is obtained by taking the mean score of all 8 items for each participant.

Summary of Diabetes Self-Care Activities

The Summary of Diabetes Self-Care activities (SDSCA) is a self-report questionnaire to measure how frequently individuals with diabetes performs self-care activities. This questionnaire was purchased with permission to use, and can be found in Appendix I. The SDSCA consists of 10 items that ask the respondent how many days in the past week the respondent completed self-care activities. Two additional questions (question 11a and 11b) ask the respondent if he or she smokes, and if yes, request the number of cigarettes smoked per day. The items are divided into the following subscales: general diet (2), specific diet (2), exercise (2), blood sugar testing (2), foot care (2), and smoking (1) (Toobert & Glasgow, 2000). The first 10 items are rated on a Likert scale from 0-7 with “0” meaning the activity was not performed on any day in the past week, and a “7” indicating that activity was performed 7 days in the past week. The questionnaire is scored by adding the responses to each question and then calculating a mean score. Each subscale is individually scored to identify deficits in specific areas of self-

care. See the *Scoring Instructions of the Summary of Diabetes Self-Care Activities* in Appendix I for full scoring instructions (Toobert & Glasgow, 2000).

The SDSCA has good validity and reliability. Each subscale consists of two to three items with average inter-item correlations each of the subscales greater than 0.5. The exercise subscale had the higher inter-item correlation of 0.77. Subjects were tested six months after the initial assessment for test-retest reliability assessment. The test suggested a moderate degree of reliability (Toobert & Glasgow, 2000). Face validity was established with a diverse group of experts using a Delphi procedure. Items that received the highest ratings were medications, blood glucose testing, and diet. The scale was determined to have good face validity (Toobert & Glasgow, 2000).

In this EBP project, the SDSCA score was calculated based on the scoring guidelines. Participants used a number between 0 to 7 to rate how many days in the week an activity was performed. Items within each subscale, General Diet, Specific Diet, Exercise, and Blood Glucose Testing, were averaged to obtain a mean subscale score. Two specific items (11a and 11b) asked respondents about smoking status.

Glycosylated Hemoglobin A1C

A pre intervention A1C laboratory value was obtained from chart review. The most recent A1C was documented on the medical history sheet. Any A1C result documented within the prior 12 months was acceptable as the pre intervention A1C. The post intervention A1C was to be obtained at the final class by point-of-care testing. Due to mandatory restrictions related to COVID-19, the class was not permitted to meet in-person at the private psychiatric clinic. Thus, no post intervention A1C was obtained for comparison.

Project Results

Data Analysis

Demographic data and medical history data were obtained to describe the sample. Demographic data was collected using a self-reported survey. The participants were asked to provide their age, height, weight, gender, race, education level, and current occupation status. Medical history data was obtained through chart review by the DNP student. This data included the year diagnosed with diabetes, current A1C, comorbidities, psychiatric diagnosis, and current medications.

Demographic and medical history data were entered into an excel spreadsheet. Frequencies and means were calculated and entered in data display tables. Participant attendance was recorded for each class and subsequently entered into the excel spreadsheet. The SDSCA and DSES surveys were scored in accordance with the scoring instructions. The pre-intervention scores and post-intervention scores of each of the respective surveys were compared using a one tailed paired t-test. A p-value of < 0.05 was considered significant for this project.

Demographic Data

Demographic data is summarized in Table 1. There were a total six participants ages 39-63 years with a mean age of 50 years. Most of the participants were female (83%). Body Mass Index (BMI) was calculated based on self-reported height and weight. The range for BMI was 24.3 to 46.2, with a mean BMI of 39.7. Five participants were obese (BMI>30) and one participant had a normal BMI (18.5-25). Half of the participants were African American/Black, and half were Caucasian/White. One participant did not finish high school, one finished high school, three participants finished college, and one participant had post college education. Of the six participants, five were unemployed and one reported being retired.

Table 1
Demographic Data

Age (mean)	39-63 (50)
BMI (mean)	24.3-46.2 (39.7)
<hr/>	
Characteristics	<i>n</i>
<hr/>	
Gender	
Female	5
Male	1
Race	
African American	3
White	3
Education	
Less than high school	1
High school	1
College	3
Post College	1
Occupation	
Unemployed	5
Retired	1

Note. BMI = body mass index (kg/mg²)

Medial History Data

Medical history data is summarized in Table 2. Participants were diagnosed with diabetes between 2005 and 2019. All participants had a diagnosis of T2DM, and the average years living with diabetes was 8.6. The youngest participant (age 39) was diagnosed with diabetes one year prior to the start of the DSMES course, and the oldest participant (age 63) had diabetes since 2005. The pre-intervention A1C range was 5.8% and 12%, with a mean A1C of 8.1%. Of the six participants, four participants had uncontrolled diabetes (A1C >7%) and two participants had well controlled diabetes (A1C <7%). Five out of six participants were obese, three had heart disease, and three had chronic kidney disease. All participants were on at least one medication for diabetes, and two participants were taking two or more. Of the diabetic medications, all

participants were prescribed oral diabetic medication. In addition, two participants were prescribed fast acting insulin, and two prescribed long acting insulin.

All participants had a diagnosis of mental illness. Half (three) of the participants had a diagnosis of anxiety, three had a diagnosis of depression, three had a diagnosis of schizophrenia, two had a diagnosis of bipolar 2, one had a diagnosis of schizoaffective disorder, one had a diagnosis of bipolar 1, and one had a diagnosis of personality disorder. All participants had more than one diagnosis of mental illness. All participants were taking psychotropic medications; four participants reported taking two or more psychotropic medications. Of the psychotropic medications, four of the participants were prescribed SNRIs, two were taking atypical antipsychotics, one was taking typical antipsychotics, one was taking SSRIs, one was taking tricyclic antidepressants, one was taking lithium, and one was taking sodium valproate.

Table 2

Medical History Data

Years with T2DM (mean)	1-15 (8.6)
A1C (mean)	5.8-12.2 (8.67)
Medical History	<i>n</i>
Comorbidities	
Obesity	5
Heart Disease	3
Chronic Kidney Disease	2
Diabetes Medications	
Oral	6
Injectable insulin – fast acting	2
Injectable insulin – long acting	2
Psychiatric Diagnoses	
Anxiety	3
Depression	3
Schizophrenia	3
Bipolar 2	2
Schizoaffective disorder	1
Bipolar 1	1
Personality Disorder	1
Psychotropic Medications	
SNRI	4
Atypical antipsychotics	2
Typical antipsychotics	1
SSRI	1
Tricyclic antidepressants	1
Lithium	1
Sodium valproate	1

Note. SNRI = serotonin norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor.

Class Attendance

Class attendance was recorded in an excel spreadsheet. Six participants completed both pre and post questionnaires. Class size ranged from one participant to five participants. None of the participants attended all eight classes. One participant attended seven classes, and two participants attended two classes. On average participants attended four classes.

Diabetes Self efficacy Scale

The Diabetes Self Efficacy Scale (DSES) scoring was calculated using the mean score for each participant. The mean pre-intervention score was 5.15 and the mean post-intervention score was 6.15. A DSES score above 6.87 reflects good self-efficacy. Of the six participants, four had good self-efficacy post intervention. The change in mean scores was statistically significant ($p=0.003$). The mean standardized score is presented in Table 3.

Table 3

Diabetes Self-Efficacy Scale

DSES scores	Pre	Post	<i>p</i> -value
Mean	5.15	6.15	0.003

Note. Standardized scores.

The mean scores improved from pre-intervention to post-intervention on all eight items. The items with mean scores and standard deviations are displayed in Table 4.

Table 4

Diabetes Self Efficacy Scale

Item Number	Pre M (SD)	Post M (SD)
1	4.33 (3.2)	5.5 (2.43)
2	4.3 (2.1)	5.83 (2.4)
3	4.33 (1.97)	5 (2.6)
4	5.5 (2.59)	6.67 (3.01)
5	5.83 (3.06)	5.5 (1.76)
6	5.83 (3.43)	6.5 (2.95)
7	6 (2.75)	7.17 (3.37)
8	5 (1.3)	7 (3)

Note. M= mean. SD= standard deviation.

SDSCA

Results of the SDSCA are depicted in Table 5. The General Diet Subscale mean score, pre-intervention of 3 and post-intervention of 5, was statistically significant ($p= 0.0003$). All other mean subscale scores, specific diet ($p=0.104$), exercise ($p=0.244$), blood glucose testing ($p=0.293$), and Foot Care ($p=0.223$) did not show a statistically significant improvement.

Table 5

Mean Scoring of SDSCA by Subscales

SDSCA Standardized Scores	Pre	Post	<i>p</i> -value
General Diet	3	5	0.0003
Specific Diet	4	4	0.104
Exercise	3	3	0.244
Blood glucose testing	4	4	0.293
Foot Care	3.75	4	0.223

Note. Standardized scores.

Of the ten items of the SDSCA that asked the participant how many days they performed a self-care activity, there was improvement in six items, no change in three items, and one item worsened.

Table 6
Summary of Diabetes Self Care Activities

Subscale and Item Number	Pre M (SD)	Post M (SD)
General Diet		
1	3 (3)	5 (1)
2	3 (2)	5 (1)
Specific Diet		
3	4 (2)	5 (2)
4	4 (2)	4 (2)
Physical Activity		
5	4 (3)	4(2)
6	2 (3)	3(3)
Blood Sugar		
7	5(3)	5 (3)
8	4.3 (2.5)	4 (3)
Foot Care		
9	4.5 (2.81)	5 (3)
10	3 (3.1)	3.7 (2.4)

Note. M= mean. SD= standard deviation.

Glycosylated Hemoglobin A1C

A pre intervention A1C was obtained from chart review, participant results are displayed in Table 1. A post intervention A1C could not be assessed related to COVID-19 restrictions.

Participant-identified barriers

There were several potential participant-identified barriers. Several questions and comments came up during and at the end the following classes: Healthy Eating, Being Active, Taking Medication, Monitoring, and Healthy Coping. Of note, participants did not express any barrier to Problem Solving or Risk Reduction.

Some of the participant comments related to healthy eating were: “I can’t afford healthy food; it is so much cheaper to go to McDonald’s and get a \$1 cheeseburger than a \$5 salad.” Another comment was “It’s hard to cook at all because I don’t like cooking for just myself” and “I just have a hard time eating healthy because I don’t like healthy food.” Another comment was “I have depression and when I get depressed, I eat junk food.”

Comments related to physical activity centered around participant motivation or emotions. A participant stated, “I just don’t have enough time in the day to exercise, I have other things I need to take care of and do.” Another participant stated, “When my mood gets low, exercise is the last thing I want to do.” The third participant had a COVID-19 related barrier “I usually go to the gym and do water aerobics, but they are not having class because of the coronavirus, and I wouldn’t go even if they did because I don’t want to get sick.”

Comments about taking medication and monitoring were related to forgetting to take medication and forgetting to monitor blood glucose. Participant stated, “sometimes I run errands when I need to take my medication, but I forget to bring it with me.” Another participant stated, “I am hungry in the morning, so I eat before I remember to check my blood sugar”.

Comments about barriers to healthy coping were stated during that specific class or during other classes. One participant stated, “sometimes I feel really down, and I just feel unmotivated to exercise or cook dinner.” Another participant stated, “I get anxious sometimes and it’s hard to focus on anything.”

The comments were discussed during the classes. Participants helped each other identify ways to mitigate the barriers and used goal setting as a way to change. Some participants found goal setting to be very helpful; one participant said “By setting just a small goal of walking two times a week for 30 minutes, it helps hold me accountable. I want to be able to come to class and say that I met my goal. I am now up to three days a week walking and I hope to keep improving.” A participant who struggled with emotional barriers such as exercising when feeling depressed, said that goal setting and discussion the barrier in class did not make a difference.

Discussion

The ADA Standards of Care strongly recommends, that all adults with diabetes participate in DMSES. By participating in DSMES, adults can improve self- efficacy and self-care activities which decrease the risk for diabetes complications. The prevalence of T2DM in Lucas county (12%) is higher than the National average (9.4%), so there is a need for diabetes education in this area. In addition, adults with mental illness are at higher risk than the general population for developing complications from diabetes.

This EBP project using a DSMES course demonstrated an improvement in diabetes self-efficacy. The mean self-efficacy score improved from 5.15 pre-intervention to 6.15 post intervention. Four out of six participants had scores that reflected good self-efficacy (> 6.87) post intervention, compared to one participant with good self-efficacy pre-intervention. The increased self-efficacy score correlated with findings by Mcbain (2016). In that study, 52 adults with diabetes and mental illness were assigned to a diabetes management program and were found to have improved self-efficacy and knowledge of diabetes (Mcbain, et. al., 2016). Similarly, Copsey et al. (2014) implemented a one-hour diabetes class to hospital inpatients with diabetes, and 98% of participants reported increased self-efficacy in managing diabetes. Additionally, Reis et al. (2017) found a statistically significant difference in self-efficacy between the intervention group, who attended a self-efficacy model-based diabetes education class, when compared to the control group.

Like the study by Resi et al. (2017), this EBP project utilized the self-efficacy model which incorporates goal setting into the intervention to promote performance achievement. A descriptive correlation study by O'Donnell et al. (2018), evaluated goal setting in a DSMES intervention. About 87% of the 275 participants reported continuing to meet and set goals 3 months after the completion of the DSMES intervention.

In this EBP project there was no significant change in the areas of self-care activities. Only one subscale, General Diet had a statistically significant change. Even though the remaining scales were not statistically significant, individual items did have clinical significance. The mean scores of six items improved, three items remained the same, and one item worsened. Many studies in the review of literature showed a statistically significant improvement in self-care activities. A RCT with a sample of 495 adults with T2DM showed a statistically significant difference in self-care activities between an 18-month diabetes education class and a control group. The duration of the study was much longer than the duration of this EBP project duration. (Ose, et. al., 2019). A future goal would be to lengthen the duration of the class to see if this makes a more significant impact on self-care activities. Additionally, participants could be asked to again complete the surveys at 6, 12, and 18 months after the initial 8-week DSMES course.

In a qualitative study of 428 individuals with diabetes, those with anxiety and depression had lower adherence to self-care activities (Martel, et. al., 2019). In this EBP project four out of six of participants had a diagnosis of either anxiety or depression. This factor may contribute to a lack of improvement in other SDSCA subscales scores. A cross sectional study of 392 adults with diabetes found higher self-efficacy associated with higher performance of self-care activities (Amer, etl. Al., 2018). In this EBP project the mean self-efficacy score improved from 5.15 to 6.15, however 6.15 is not considered high self-efficacy (>6.87).

Another reason that the results of this EBP project do not correlate with other studies is because of the poor DSMES class attendance. Due to COVID-19, all WHY class were switched from in-person to online classes, and attendance to all WHY classes decreased. The mean number of classes attended by each participant was four classes out of eight classes. Two

participants only attended two classes. Because of poor participant attendance, individuals may have missed information to improve self-care activities.

It is important to address the impact of a mental illness diagnosis on results of this EBP project. Studies have shown that adults with T2DM and mental illness perform fewer self-care activities than those with T2DM alone (Chen, Chien, Kang, Jeng, & Chang, 2014; Mulligan et al., 2018). Thus, the findings from this study correlate with the low improvement in self-care activities in this EBP project. Within this EBP population, all participants had at least two mental illness diagnoses, and five participants had a diagnosis consistent with SMI. The complex relationship between SMI and diabetes can impact diabetes self-management, and these mental illnesses could have had an effect on results. For example, a participant with depression was having difficulty meeting the goals set in class. The participant did not meet the goal of walking three times weekly and stated “I’ve eaten a lot of junk food this week because I have been depressed.” A participant with bipolar disorder had poor organization skills and would often forget what goal was set the previous week. The participant stated “my attention is just everywhere and it’s sometimes hard to focus in class. I have so many things on my mind and so many things I have to do in a week” and “I didn’t come to class last week because I just forgot!”

In this EBP population, three participants had schizophrenia. Individuals with schizophrenia have symptoms of impairment of memory, attention and cognition; all of these can affect the reception and retention of class information (Fischer & Buchanan, 2020). Another prevalent SMI diagnosis in this EBP population was bipolar; two participants had a diagnosis of bipolar 1, and one participant had a diagnosis of bipolar 2. Adults with bipolar have cyclical mood changes that vary in severity among individuals, but in general have transitions between periods of major depression, mania (bipolar 1), and hypomania (bipolar 2). These individuals can

suffer from changes in mood, behavior, energy, memory, concentration, and cognition (Suppes, 2019). Again, the symptoms of this mental illness can affect the reception of class information which can impact self-care activity performance. Additionally, five participants had more than one mental illness diagnosis. The compounding effects of more than one mental illness with varying symptoms may have made it difficult to grasp DSMES information and affect a behavior change.

One individual who initially agreed to participate in the EBP project that was subsequently suspended from all WHY activities for inappropriate class behavior. The individual interrupted others had arguments with someone in the household during class time without turning off the microphone and made rude comments towards the class mediator and other students. This participant exhibited impulsive behavior and social impairment consistent with SMI symptoms which created a barrier to learning. In future studies it may be beneficial to further identify and adopt tailor made educational methods to teach adults with these specific types of mental illnesses about diabetes management.

Economic Impact

The direct economic and financial outcomes of this EBP project are difficult to assess due to the small sample size. Diabetes places a huge financial burden on the United States health care system. DSMES has the potential to ease this burden in individuals with T2DM by improving their self-efficacy and increasing their self-care activities, both of which has been shown to reduce diabetes-related healthcare costs (*Return on Investment*, 2018). If the WHY committee decides to continue to teach this class in the future, it has the potential to have a positive economic impact.

Sustainability of Implementation and Future Recommendations

It is highly likely that this EBP project will be maintained despite the small number of participants and lack of significant results. The WHY committee planned to resume the DSMES class for Fall of 2020 and use the DNP student created classes, PowerPoints, and class format. The WHY committee is hopeful that more individuals with mental health diagnoses will be agreeable to online delivery of classes since all classes were maintained in that format.

Strengths and Limitations

A strength of this EBP project was the support from the WHY committee. Additionally, the primary care nurse practitioner and administrative staff were extremely supportive of the project. They referred patients, blocked off a class time, and assisted the DNP student in transitioning to an online platform via video conference platform, Vido. A strength of this project was the implementation of an evidenced based intervention. Also, there was a statistically significant improvement in self-efficacy, and an improvement in some self-care activity item scores.

There are several limitations to this EBP project, primarily related to the challenges and issues associated with COVID-19. Due to the pandemic, the WHY committee, had to convert to an online delivery format for all classes. Since this mandatory switch, class attendance was decreased for all WHY classes, including the DSMES class taught for this EBP project. This may be an important factor in determining the best method to deliver education to individuals with dual diagnoses of diabetes and mental illness. In this EBP project, there was a very low number of participants recruited for the class (12), compared to pre COVID-19 onsite WHY classes that have an average initial sign up list of 20 participants. A larger sample size may have led to more diversity among participants, as with the small sample size, only five of the six participants were female. Pre and post surveys were self-reported, so there is a potential for bias,

including the self-reported height and weight. Another limitation was class attendance. None of the participants had perfect attendance, and two participants attended only two classes. This contributed to incomplete delivery of class content, which could have influenced post survey results. In addition, one preplanned outcome of obtaining pre and post A1C, could not be evaluated due to the virtual format. Repeat assessment of A1C was unable to be performed as contact with participants was restricted due to COVID-19.

Conclusion

Diabetes affects 10% of the population and is projected to steadily increase. Adults with mental illness are two to three times more likely to develop diabetes than the general population ("A Practical Approach to Mental Health for the Diabetes Educator," 2018). This is associated with poor self-efficacy and a low performance of self-care activities (Chen et al., 2014; Mulligan et al., 2018). Participation in DSMES is recommended by the ADA (2020) to increase self-efficacy, increase self-care behaviors, and improve quality of life. Adults with diabetes spend up to three times more on healthcare annually related to diabetes complications. Participation in DSMES can potentially reduce the risk for diabetes related complications and decrease overall healthcare cost contributing to a strong economic impact.

In this EBP project the delivery of a DSMES class to adults with diabetes and mental illness showed a statistically significant improvement in self-efficacy, and an improvement in SDSCA in the mean scores of five items. Although this intervention had severe limitations related to number of participants and class attendance, the DSMES course has the potential to positively impact the self-efficacy and performance of self-care activities. Future studies to more fully support individuals with diabetes and mental illness should be conducted.

DNP Essentials

The Doctor of Nursing Practice Essentials are the foundational outcome competencies of a DNP graduate. Developed by the American Association of Colleges of Nursing (ANCC) in 2006, the essentials assist as a guiding framework for advanced nursing practice. This evidence-based practice project was implementing using these essentials.

Essential 1: Scientific Underpinnings for Practice DNP

This essential reflects scientific underpinnings in the terminal academic preparation for nursing practice (ANCC, 2006). The DNP student shows competence in this essential by translating knowledge into practice to benefit patients. This essential is utilized in the design and implementation of an evidenced based intervention. It is recommended by the ADA that patients diagnosed with diabetes should participate in DSMES, and study findings support this evidence.

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

The DNP graduate exhibits this essential by creating healthcare goals to promote patient safety and a high level of practice (ANCC, 2006). The DNP student worked with administrative staff to implement an evidenced based intervention that was not previously been implemented. Because of the success of the class, the clinic plans to renew this class in the upcoming year. By implementing an evidence-based change in practice, this project exhibits organizational leadership by the implementation and sustainability of this intervention.

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

This essential prepares the DNP graduate to use analytical methods to critically appraise evidence and identify the best way to implement this evidence (ANCC, 2006). In this project, the DNP student exhibited this essential by conducting an extensive literature review, critiquing the evidence, and synthesizing the evidence to identify and implement best practice.

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

DNP graduates are able to use information technology to provide the best practice for patients. The DNP graduate should be able to use technology to apply new knowledge and manage information, and adapt as the technology changes (ANCC, 2006). This essential was met through utilization of the electronic medical chart to review medical history for participant and using technology to organize and synthesize project literature review and findings. In the current situation with COVID-19, healthcare technology is rapidly transforming and becoming more central to patient care. This project adapted to incorporate a virtual delivery using current technology.

Essential V: Health Care Policy for Advocacy in Health Care

This essential creates a framework to facilitate the ability of the DNP graduate to engage in advocacy for healthcare policy change. It prepares the DNP graduate to examine policy at local, state and national levels (ANCC, 2006). This intervention describes the need for self-management education to all diabetic patients, as it reduces healthcare complications and overall healthcare cost. In addition, the project highlights how diabetes disproportionately effects individuals with mental illness.

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

Healthcare today is complex, and good patient care requires the contributions of multiple professions. The DNP graduate has advanced preparation in that allows them to facilitate interprofessional collaboration (ANCC, 2006). This essential was met during the planning and implementation process of the intervention. The DNP student facilitated multiple

interprofessional meetings prior to implementing the intervention with different members of the WHY program, as well as the research committee members at the outpatient psychiatric clinic. The DNP student worked with a nurse practitioner, social worker, director of nursing, and administrative support staff to successfully plan and implement this intervention.

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

The DNP graduate is able to implement clinical prevention and population health activities (ANCC, 2006). The goal of the project was to improve self-efficacy of diabetes management and performance of self-care activities. Evidence supports that by improving self-efficacy and self-care, it can prevent complications of diabetes. This is a good, evidenced based service for patients with diabetes, and as more and more patients with diabetes receive these services, it has a great impact on population health.

Essential VIII: Advanced Nursing Practice

This essential reflects the increased knowledge of the advanced nurse and the growth of specialization in nursing. An advanced nurse is prepared to master a specialty that requires expertise and advanced knowledge (ANCC, 2006). The DNP student hopes to specialize in family practice, and this project falls within the scope of this specialty. The DNP student worked in an advanced practice role by identifying a problem and an evidenced based solution, working with members of an interdisciplinary team, and implementing an evidenced based practice project.

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Appendix A

Evidence Synthesis Table

Author	Year	Study Type	Population	Method	Results	LOE
Amer, Mohamed, Elbur, Abdelaziz, Elrayah	2018	Cross sectional study	n= 392 adults with T2DM	DMSES and SDSCA to evaluate relationship between self-efficacy and self-care activities	Higher self-efficacy score was significantly associated with adherence to self-care activities	IV
Chen, Chien, Kang, Jeng, Change	2014	Descriptive Comparative Study	105 adults with schizophrenia and T2D, 106 adults with T2D	DMSES and SDSCA to measure self-efficacy and self-care management	Adults with schizophrenia and T2DM had lower self-efficacy scores, and performed fewer self-care activities than those with T2D alone	VI
Chrvala, Sherr, Lipman	2016	Systematic review	118 studies	Literature review of effect of DSMES intervention on A1C	Overall mean reduction in A1C was 0.74 and 0.17 for intervention and control groups, respectively;	I
Cospey Abate, Zucconi	2014	Quasi experimental study	Diabetic patients currently admitted to the hospital	1 hour self-care class to admitted hospital patients	No patients readmitted within 30 days. Significant decrease of 23%. 98% subjects reported feeling better prepared to manage their diabetes.	III

Felix, Narcisse, Long, English, Hggard-Duff, Purvis, McElfish	2019	RCT	211 adults with T2DM	Standard DSMES vs Family members included in DSMES	No significant difference between groups. But significant increase in both groups in self-care activities.	II
Gurmu, Gela, Aga	2018	Cross sectional	257 patients with diabetes	SDSCA used to evaluate predictors of self-care activities,	Higher diabetes knowledge, self-efficacy, social, secondary school education, and longer duration of diabetes were important predictors of good diabetes self-care practice. Programs should use strategies that enhance patients' diabetes knowledge, self-efficacy, and social support	IV
He, Li, Wang, Yao, Li, Song, Shi, Zhang	2017	Meta-analysis	42 RCTs containing 13,017 participants	RCT comparing DSMES to usual care	Diabetes self-management education can reduce all-cause mortality risk in T2DM patients.	I
Hildebrand, Billimek, Lee, Sorkin, Olshansky, Clancy, Evangelista	2019	Systematic review and meta-analysis	18 studies, Latinos with T2D	Literature review to identify effect of DSMES on A1C	Greater A1C reductions in studies with intervention duration less than 6 months, initial A1C baseline values >8.0 and team-based approach.	I
Author	Year	Study Type	Population	Method	Results	LOE
Hwee, Cauch-Dudek, Victor, Shah	2014	Population based cohort study	77,824 adult diabetic patients in Ontario	Group vs individual counseling	Participants in group classes were less likely to have ER visits for hospital admissions for hypo/hyperglycemia More likely to have adequate HbA1c testing and lipid testing, and were more likely to receive statins	IV
Martel, Fernandez, Cuadrado, Vigray, Carrillo, Bornat,	2019	qualitative	428 patients with type 1 diabetes	Complete a questionnaire to	Motivation, training in diabetes management, beliefs regarding the disease,	VI

Montedeoca, Wagner				identify barriers to self-care	and self-efficacy were the main contributors to adherence to self-care activities. Anxiety and depression were highly prevalent and associated with lower adherence.	
McBain, Mulligan, Haddad, Flood, Jones, Simpson	2016	Systematic Review	64 Adults with 2TDM & mental illness	Multiple searches – included 1 study with 3 trial reports. This study used a 6-week DART program	Diabetes knowledge, self-efficacy, total activity minutes increased after DART intervention	I
McElfish Long, C. R., Bursac, Z., Scott, A. J., Felix, H. C., Schulz, T. K., . . . Rowland	2019	RCT	221 Marshallese adults with T2DM	Randomized into standard DSMES (community class) and In-home DSMES	Greater than 10 exposure hours led to significant reduction in A1C.	II
Mulligan, McBain, Lamotagne-Godwin, Cahpman, Flood, Haddad, Jones, Simpson	2018	Cross sectional survey	77 adults with T2DM and mental illness	Anonymous survey using SDSCA; CORE-10 of psychological distress;	Self-care is poor among those with T2DM and mental illness. There is a need to improve diabetes self-management support for those with mental illness and T2DM by implementing diabetes action plans and education into care	IV
O’donnel, Horne, Carey, Davies, Dinneen	2018	Descriptive correlation study	275 persons with diabetes	Participation in group DSMES (3 months) with pre and post survey describing individual action plan with goal setting	87% of participants reported meeting goals set in their action plan after DSMES class. Goal setting in a group DSMES class can improve behavior change	VI

Ose, Kiel, Freund, Besier, Mayer, Krisam, Wensing, Salize, Szecseny	2019	RCT	495 patients between	18-month long DSMES intervention vs care as usual.	Significant increase in performance of self-care activities in the intervention group as evidenced by SDSCA	II
Pillay, Armstrong, Butalia, Donovan, Sigal, Vadermeer, Chordiya, Hartling, Nupal, Featherstone, Dryden	2015	Systematic review	132 RCTs comparing DSMES behavioral programs with care as usual	Literature review	DSMES leads to improvements in glycemic control and reduction in BMI with more than 11 contact hours.	I
Reis M., Javadzede, H., Sharifirad, G., Mostafavi, F., Tavassoli, E., & Imanzad, M	2017	RCT	80 patients with T2DM	Control group vs intervention group. Self-efficacy theory-based intervention included 5 group sessions and 1 individual counseling session.	Statistically significant difference between groups regarding self-efficacy, outcome expectations and adherence to self-care activities in the 3 and 6-month follow-up measurement, and the A1C in the 6 month follow up period.	II
Ricci-Cabello, Ruiz-Perez, Rojas-García, Pastor, Rodríguez-Barranco, Goncalves	2014	Meta-analysis	24 studies	Literature review of groups with T2DM receiving diabetes intervention	Half of interventions were group based. Average length of class was 13 sessions Programs improved diabetes knowledge, self-management activities, and clinical outcomes.	I
Rygg, Rise, Gronning, Steinsbekk	2012	RCT	146 patients with T2DM	Group education vs control group	No change in A1C between groups at 12 months, but control group got worse by 0.3%. Diabetes knowledge and self-management skills improved significantly in the intervention group	II
Shrader, Martin, & Cogdill	2013	RCT	60 patients with T2DM	Group education vs control group	1.1% decrease in A1C – not found to be statistically significant (p=0.05).	I

Tharek, Ramli, Whitford, Ismail, Zulkifli, Sharoni, Jayaraman,	2018	Cross sectional study	350 patients with T2DM	Given DMSES and SDSCA questionnaires	Positive relationship between self-efficacy and self-care behavior ($r = 0.538$, $P < 0.001$). Higher self-efficacy score correlated with lower HbA1c ($r = -0.41$, $P < 0.001$). higher self-efficacy scores, shorter duration of diabetes significantly associated with good glycemic control.	VI
Venkataraman, Kannan, Kalra, Gambhir, Sharma, Sundaram, & Mohan,	2012	Cross sectional study	507 patients T2DM	Detailed interview used to identify predictors of glycemic control	Self-efficacy was the single most important factor of glycemic control ($A1C < 7$)	VI

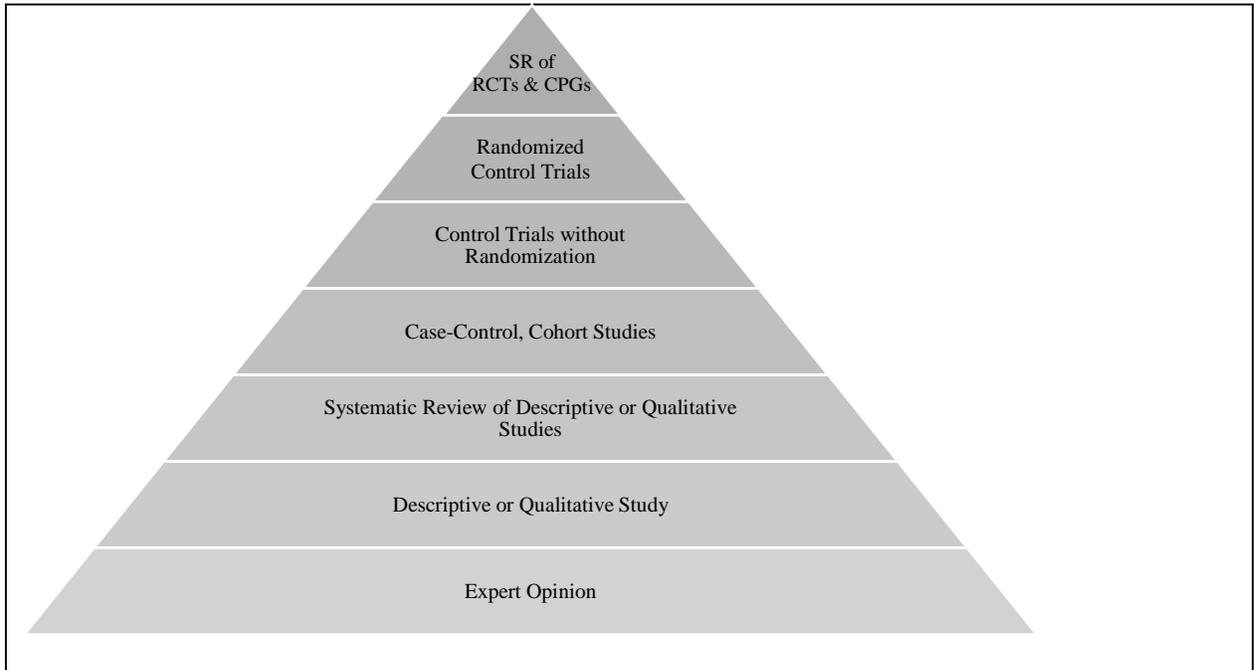
Note. LOE=level of evidence, T2DM=type II diabetes mellitus, RCT= randomized control trial, DSMES=diabetes self-management education services, DMSES=diabetes management self-efficacy scale, SDSCA: summary of diabetes self-care activities measure

Appendix B

1. Are the results of the study valid?			
a.) Were the subjects randomly assigned to the experimental and control groups?	Yes	No	Unknown
b.) Was random assignment concealed from the individuals who were first enrolling subjects into the study?	Yes	No	Unknown
c.) Were the subjects and providers blind to the study group?	Yes	No	Unknown
d.) Were reasons given to explain why subjects did not complete the study?	Yes	No	Unknown
e.) Were the follow-up assessments conducted long enough to fully study the effects of the intervention?	Yes	No	Unknown
f.) Were the subjects analyzed in the group to which they were randomly assigned?	Yes	No	Unknown
g.) Was the control group appropriate?	Yes	No	Unknown
h.) Were the instruments used to measure the outcomes valid and reliable?	Yes	No	Unknown
i.) Were the subjects in each of the groups similar on demographic and baseline clinical variables?	Yes	No	Unknown
2. What are the results?			
a.) How large is the intervention or treatment effect (NNT, NNH, effect size, level of significance)?	_____		

b.) How precise is the intervention or treatment (CI)?	_____		
3. Will the results help me in caring for my patients?			
a.) Were all clinically important outcomes measured?	Yes	No	Unknown
b.) What are the risks and benefits of the treatment?	_____		
c.) Is the treatment feasible in my clinical setting?	Yes	No	Unknown
d.) What are my patients/family’s values and expectations for the outcome that is trying to be prevented and the treatment itself?	_____		

Rapid Critical Appraisal Checklist for a Randomized Clinical Trial (RCT). Adapted from Melnyk, B.M., & Fineout-Overholt, E. (2015). *Evidence-Based Practice in Nursing and Healthcare: A Guide to Best Practice*. (3rd ed.) Philadelphia, PA: Lippincott Williams & Wilkins.

Appendix C

. Hierarchy of Evidence. SR = Systematic Review, CPG = Clinical Practice Guideline, RCT = Randomized Control Trial. Adapted from Melnyk, B.M., & Fineout-Overholt, E. (2015). *Evidence-Based Practice in Nursing and Healthcare: A Guide to Best Practice*. (3rd ed.) Philadelphia, PA: Lippincott Williams & Wilkins.

Appendix D

Symbol	Quality	Interpretation
⊕⊕⊕⊕	High	We are very confident that the true effect lies close to that of the estimate of the effect.
⊕⊕⊕○	Moderate	We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
⊕⊕○○	Low	Our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect.
⊕○○○	Very low	We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect.

Table used for determining quality of evidenced based on GRADE ratings and their interpretation. Adapted from Ryan, R. & Hill, S. (2016). How to GRADE the quality of evidence. *Cochrane consumers and communication group*.

Appendix E

<i>Planning for Implementation Timeline</i>	
Planning for Implementation	Timeline
1. Identify Problem: poor self-efficacy, self-care activities, and glycemic control among adults with diabetes and mental illness.	08/2019
Current Standard of Care: no DSMES class NW Ohio psychiatric clinic	
Recommended Standard of Care: adults with diabetes should participate in DSMES	09/2019
2. Form a Team	
Harbor Behavioral Health WHY committee	09/2010
University of Toledo Committee Members	
· Chair: Dr. Walsh	09/2018
· Committee Member: Dr. Laskia	10/2018 – 6/20/2020
· Committee Member: Schmitt	8/1/2020
· Committee Member: Dr. Topp	02/2019
3. Evidence Retrieval	
P) Among adults ages 18 and older with a diagnosis of type 2 diabetes mellitus and any mental illness, I) how does participation in a group DSMES class, C) compared to no DSMES class, O) improve self-efficacy, increase performance of self-care activities, and improve A1C?	10/2019
Literature Review	10/2019 – 1/2020
4. Grading the Evidence	
Critical Appraisal of Literature	11/2019
Literature Synthesis	11/2019; 12/2019
Assess Practicability, Benefits and Risks of Project in Practice	10/ 2019
5. Develop an EBP standard	
Design Evidence-Based Practice (EBP) Project	10/2019; 11/2019
Defend Proposed EBP Project	02/2020
Submit IRB application	3/2020
Rewrite IRB application to accommodate online delivery DSMES course	4/2020
Submit new IRB application	5/2020
Obtain IRB Approval of EBP Project	6/4/2020
6. Implement the EBP standard	
Implement EBP Project	7/1/2020 – 8/19/2020
7. Evaluation	
Evaluate project outcomes	8/20/2020
Defend EBP Project Results	9/2020

Appendix F**Impact of Diabetes Self-Management Education on Adults with Diabetes and Mental
Illness
Demographic Data Sheet**

Please complete the following items

Participant Code Number_____

1) Age_____

2) Weight_____ **Height**_____

3) Gender

- Male
- Female

4) Race

- Black/ African American
- White/ Caucasian
- Asian
- Hispanic/Latino
- Other

5) Education level

- Less than high school
- High school
- College
- Post college

6) Which best describes your occupation?

- Employed
- Unemployed
- Retired

8) How long have you been a patient this Northwest Ohio psychiatric clinic?_____

Appendix G

**Impact of Diabetes Self-Management Education on Adults with Diabetes and Mental Illness
Medical History Data Collection Sheet**

Participant Code Number _____

1. Year diagnosed with Diabetes _____

2. Current A1C _____

3. Comorbidities

- | | | |
|---|--|-------|
| <input type="checkbox"/> Diabetic Retinopathy | <input type="checkbox"/> Lower Leg amputations | _____ |
| <input type="checkbox"/> Heart Disease | <input type="checkbox"/> Obesity | _____ |
| <input type="checkbox"/> Chronic Kidney Disease | <input type="checkbox"/> Other _____ | _____ |
| <input type="checkbox"/> Stroke | | _____ |

4. Psychiatric diagnoses

- Anxiety other _____
- Depression
- Schizophrenia
- Schizoaffective disorder
- Bipolar 1
- Bipolar 2
- Borderline personality disorder

5. Medications

- | | | |
|--|---|--|
| <input type="checkbox"/> typical antipsychotics | <input type="checkbox"/> Lithium | <input type="checkbox"/> fast acting insulin |
| <input type="checkbox"/> atypical antipsychotics | <input type="checkbox"/> sodium valproate | <input type="checkbox"/> long acting insulin |
| <input type="checkbox"/> SSRIs | <input type="checkbox"/> oral diabetic medication | <input type="checkbox"/> Other |
| <input type="checkbox"/> SNRIs | <input type="checkbox"/> non-insulin injectable | _____ |
| <input type="checkbox"/> Tricyclic antidepressants | | _____ |

Appendix H



Self-Efficacy for Diabetes

We would like to know how confident you are in doing certain activities. For each of the following questions, please choose the number that corresponds to your confidence that you can do the tasks regularly at the present time.

1. How confident do you feel that you can eat your meals every 4 to 5 hours every day, including breakfast every day?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

2. How confident do you feel that you can follow your diet when you have to prepare or share food with other people who do not have diabetes?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

3. How confident do you feel that you can choose the appropriate foods to eat when you are hungry (for example, snacks)?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

4. How confident do you feel that you can exercise 15 to 30 minutes, 4 to 5 times a week?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

5. How confident do you feel that you can do something to prevent your blood sugar level from dropping when you exercise?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

6. How confident do you feel that you know what to do when your blood sugar level goes higher or lower than it should be?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

7. How confident do you feel that you can judge when the changes in your illness mean you should visit the doctor?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

8. How confident do you feel that you can control your diabetes so that it does not interfere with the things you want to do?

not at all	1	2	3	4	5	6	7	8	9	10	totally confident
------------	---	---	---	---	---	---	---	---	---	----	-------------------

Scoring

The score for each item is the number circled. If two consecutive numbers are circled, code the lower number (less self-efficacy). If the numbers are not consecutive, do not score the item. The score for the scale is the mean of the eight items. If more than two items are missing, do not score the scale. Higher number indicates higher self-efficacy.

Characteristics

Tested on 186 subjects with diabetes.

No. of items	Observed Range	Mean	Standard Deviation	Internal Consistency Reliability	Test-Retest Reliability
8	1-10	6.87	1.76	.828	NA

Source of Psychometric Data

Stanford English Diabetes Self-Management study. Study reported in Lorig K, Ritter PL, Villa FJ, Armas J. Community-Based Peer-Led Diabetes Self-Management: A Randomized Trial. *The Diabetes Educator* 2009; Jul-Aug;35(4):641-51.

Comments

This 8-item scale was originally developed and tested in Spanish for the Diabetes Self-Management study. For internet studies, we add radio buttons below each number. There is another way that we use to format these items, which takes up less space on a questionnaire, shown also in the PDF document. This scale is available in Spanish.

Appendix I

Summary of Diabetes Self-Care Activities Questionnaire

The questions below ask you about your diabetes self-care activities during the past 7 days. If you were sick during the past 7 days, please think back to the last 7 days that you were not sick.

Diet

Number of Days

1. How many of the last SEVEN DAYS have you followed a healthful eating plan? 0 1 2 3 4 5 6 7

2. On average, over the past month, how many DAYS PER WEEK have you followed your eating plan? 0 1 2 3 4 5 6 7

3. On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables? 0 1 2 3 4 5 6 7

4. On how many of the last SEVEN DAYS did you eat high-fat foods, such as red meat or full-fat dairy products? 0 1 2 3 4 5 6 7

Physical Activity

5. On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity? 0 1 2 3 4 5 6 7
(Total minutes of continuous activity, including walking).

6. On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work? 0 1 2 3 4 5 6 7

Blood 2 Testing

7. On how many of the last SEVEN DAYS did you test your blood sugar? Number of Days
- 0 1 2 3 4 5 6 7
8. On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health-care provider?
- 0 1 2 3 4 5 6 7

Foot Care

9. On how many of the last SEVEN DAYS did you check your feet? 0 1 2 3 4 5 6 7
10. On how many of the last SEVEN DAYS did you inspect the inside of your shoes? 0 1 2 3 4 5 6 7

Smoking

11. Have you smoked a cigarette, even a puff, in the past SEVEN DAYS? 0 No 1 Yes ≡
- 11a. How many cigarettes did you smoke on an average day?
- Number of cigarettes:
- _____

Scoring Instructions for the Summary of Diabetes Self-Care Activities

Scores are calculated for each of the five regimen areas assessed by the SDSCA: Diet, Exercise, Blood-Glucose Testing, Foot Care, and Smoking Status.

Step 1

For items 1–10, use the number of days per week on a scale of 0–7. Note that this response scale will not allow for direct comparison with the percentages provided in Table 1.

Step 2: Scoring Scales

General Diet = Mean number of days for items 1 and 2.

Specific Diet = Mean number of days for items 3 and 4, reversing item 4 (0=7, 1=6, 2=5, 3=4, 4=3, 5=2, 6=1, 7=0). Given the low inter-item correlations for this scale, using the individual items is recommended.

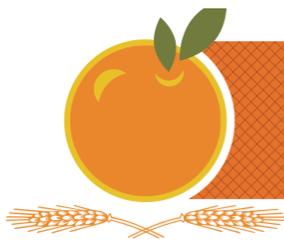
Exercise = Mean number of days for items 5 and 6.

Blood-Glucose Testing = Mean number of days for items 7 and 8.

Foot Care = Mean number of days for items 9 and 10.

Smoking Status = Item 11 (0 = nonsmoker, 1 = smoker) and number of cigarettes smoked per day.

Appendix J



AADE7 SELF-CARE BEHAVIORS®

HEALTHY EATING

If you’ve just learned that you have diabetes or prediabetes, you probably have a lot of questions about what you can or can’t eat. Do you wonder if you can ever have your favorite food again? What happens when you are eating at a restaurant or a friend’s house? Do you have to change your whole diet just because you have diabetes?

The answer is **NO**. There is nothing that you can’t eat. You don’t have to give up your favorite foods or stop eating at restaurants.

But, it is important to know that everything you eat has an effect on your blood glucose (sugar). Learning to manage portion size and making healthy food choices can help you live better with diabetes and prevent other health problems.

Some skills are more complex, but your diabetes educator or dietitian can help you learn about:

- » Counting carbohydrates
- » Reading food labels
- » Measuring the amount of a serving
- » Developing a practical meal plan
- » Preventing high or low blood glucose
- » Setting goals for healthy eating

Pick one or two of these skills and discuss them with your healthcare provider.

DID YOU KNOW?

There are only 3 main types of nutrients in food: carbohydrates, proteins, and fats. A healthy meal will include all three types.

TRUE OR FALSE:

People with diabetes can’t have sugar.

FALSE: Sugar is just another carbohydrate and can fit into a meal plan. Sugary foods, however, do not have the same nutrition as grains or vegetables, and can often be high in fat and calories. It’s best to limit sugar-containing foods to small portions, and be sure to count the carbohydrates toward the total recommended in your meal plan.

curriculum

Word Wall

CARBOHYDRATE (AKA “CARBS”):

One of the three main types of nutrients found in food. Bread, pasta, rice, fruits, vegetables (especially starchy vegetables such as potatoes, corn, peas, dried beans), milk, and sweets are all carbs. Don’t forget that carbohydrates can be found in beverages, too.

PORTION:

How much of a food you eat

MEAL PLAN:

A guide for healthy eating developed with your healthcare provider

HYPOGLYCEMIA:

Low blood glucose

HYPERGLYCEMIA:

High blood glucose



Eat breakfast every day. Breakfast helps begin the calorie-burning process that provides you with energy. Include small snacks between meals as part of your daily intake to help keep your body going.

Space your meals throughout the day. Going too long without eating may result in excessive hunger, which can lead to overeating later on. Try to eat every 4 to 5 hours during waking hours.



AADE7™ SELF-CARE BEHAVIORS
BEING ACTIVE

Being active is not just about losing weight. It has many health benefits like lowering cholesterol, improving blood pressure, lowering stress and anxiety, and improving your mood. If you have diabetes, physical activity can also help keep your blood sugar levels closer to normal and help you keep your diabetes in control.

It can be difficult to find the time or the motivation to start an exercise program. Everyone's physical abilities and schedules are different; choose the best ways to fit physical activity into your daily life—whether it's walking to work, doing chair exercises or working out at the gym.

The important thing to remember is to choose activities that you enjoy doing and to set goals that are realistic.

Your healthcare provider can help you design an activity plan that works for you.

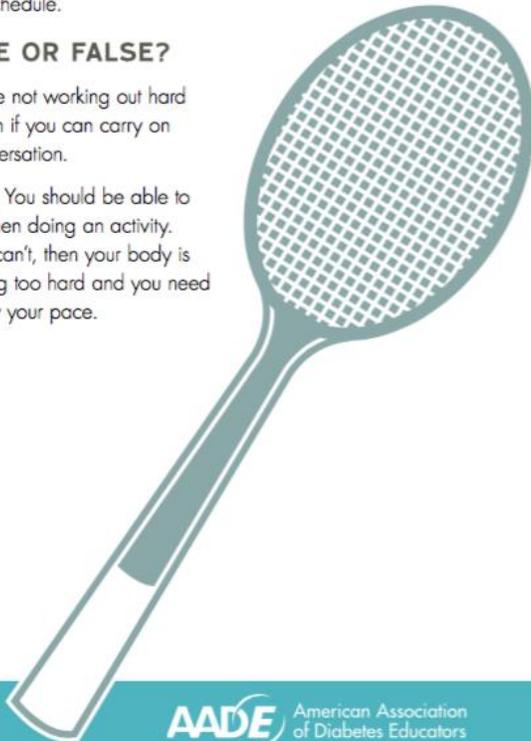
DID YOU KNOW?

Breaking activity into three 10 minute sessions throughout the day is as good as one 30 minute session. This can help you fit exercise into your schedule.

TRUE OR FALSE?

You are not working out hard enough if you can carry on a conversation.

FALSE. You should be able to talk when doing an activity. If you can't, then your body is working too hard and you need to slow your pace.



 **Word Wall**

EXERCISE (OR PHYSICAL ACTIVITY):

Activities that get your body moving and help you stay healthy

CARDIO:

Exercise that raises your heart rate

RESISTANCE TRAINING:

Activities that help you build muscle and strength



 **QUICK TIPS**

Any amount of physical activity is better than none at all. Making physical activity part of your daily lifestyle burns calories even if it's not part of a structured plan.

Even if you are inactive and out of shape now, you can improve your health by moving just a little more. Take small steps to add more movement into your daily lifestyle. In time, you will find that you are stronger and will be able to move even more!

Check your glucose before and after physical activity to learn how your body responds.



AADE7™ SELF-CARE BEHAVIORS MONITORING

Checking your blood sugar levels regularly gives you vital information about your diabetes control. Monitoring helps you know when your blood sugar levels are on target. It helps you make food and activity adjustments so that your body can perform at its best. It takes some time and experience to figure out how your daily activities and actions affect your blood sugar.

Your diabetes educator can help you learn:

- » How to use a blood sugar (glucose) meter.
- » When to check your blood sugar and what the numbers mean.
- » What to do when your numbers are out of your target range.
- » How to record your blood sugar results.

Checking your blood sugar is an important part of diabetes self-care, but monitoring your overall health includes a lot of other things too, especially when you have diabetes. You and your healthcare team will also need to monitor you:

- » Long-term blood sugar control—A1C, eAG
- » Cardiovascular health—blood pressure, weight, cholesterol levels
- » Kidney health—urine and blood testing
- » Eye health—dilated eye exams
- » Foot health—foot exams and sensory testing

DID YOU KNOW?

The American Diabetes Association recommends an A1C target below 7% (an eAG of 154 mg/dl); the American Association of Clinical Endocrinologists recommends less than 6.5% (an eAG of 140 mg/dl).

TRUE OR FALSE?

If you want to see how your body responds to your meal, wait 2 hours after eating to check your blood sugar levels.

TRUE. Your blood sugar rises in response to what you've eaten. It takes about 2 hours for the numbers to reflect the full rise.

Word Wall

METER:

A small device that is used to check blood sugar levels

LANCET:

A small needle used to get a blood sample

A1C:

A test that measures your average blood sugar levels during the past 2-3 months

ESTIMATED AVERAGE GLUCOSE (eAG):

The number of the A1C test changed into mg/dl like the blood sugar levels shown on your glucose meter

QUICK TIPS

Wash your hands with soap and water and dry them thoroughly before checking your blood sugar. Substances on your skin (like dirt, food, or lotion) can cause inaccurate results.

When traveling, keep your supplies with you. Advise security personnel that you are carrying diabetes supplies.

If you have trouble affording the test strips, call the toll-free number on the back of your meter to see if coupons are available, or ask your diabetes educator about other resources.



AADE7 SELF-CARE BEHAVIORS®

TAKING MEDICATION

There are several types of medications that are often recommended for people with diabetes. Insulin, GLP-1 and pills that lower your blood glucose, aspirin, blood pressure medication, cholesterol-lowering medication, or a number of others may work together to help you lower your blood glucose levels, reduce your risk of complications and help you feel better.

Your medications come with specific instructions for use—and they can affect your body differently depending on when and how you take them. It may take a while to figure out which medicines work best with your body. So it's important for you to pay attention to how you feel and how your body reacts to each new medicine or treatment. It's up to you to tell your pharmacist, doctor, nurse practitioner, or diabetes educator if you've noticed any side effects.

It's important to know the names, doses and instructions for the medications you're taking, as well as the reasons they are recommended for you.

REMEMBER TO:

- » **Ask your doctor, nurse practitioner or pharmacist** why this medication was recommended for you.
- » **Ask your diabetes educator** to help you fit your medication routine into your daily schedule. Be sure to bring all medications or labels with you when you go to health appointments.
- » **Ask a family member** to go with you to an appointment and take notes about any medication instructions. Or, ask someone to remind you to take your medications if you have difficulty remembering to take them.

DID YOU KNOW?

Some over-the-counter products, supplements, or natural remedies can interfere with the effectiveness of your prescribed medicines. Tell your diabetes educator about ANY supplements you are taking so that he/she can make the best recommendations for your care.

TRUE OR FALSE?

When you inject insulin, you need to rotate your injection sites.

TRUE. If you inject insulin or other injectable medications in the same spot every time, your tissue can become damaged and won't absorb insulin as well. Be sure to rotate your injection sites between the fattier parts of your upper arm, outer thighs, buttocks, or abdomen.

Word Wall

INSULIN:

A hormone that helps the body use glucose (sugar) for energy

GLP-1: Glucagon-like peptide-1

A naturally occurring hormone made in the intestines responsible for stimulating insulin secretion in response to a meal

SIDE EFFECT:

An effect that a drug has on your body that it is not intended (e.g. diarrhea, nausea, headache)



QUICK TIPS

If you often forget to take your medication, try to remind yourself by linking it to a specific activity—like watching the news every night or brushing your teeth—or by setting an alarm on your watch or cell phone.

Take a pen and some paper with you to your healthcare visit and take notes when your provider tells you about your medicine.



AADE7 SELF-CARE BEHAVIORS®

PROBLEM SOLVING

What do you do when you have a problem like low blood glucose (sugar), also called hypoglycemia? Do you know what caused it? How can you help reduce the risk of it happening in the future?

Everyone encounters problems when managing their diabetes; you can't plan for every situation you may face. However, there are some problem-solving skills that can help you prepare for the unexpected—and make a plan for dealing with similar problems in the future.

Some of the most important problem-solving skills for diabetes self-care are learning how to recognize and react to high and low blood glucose levels and learning how to manage on days when you are sick.

Your diabetes educator can help you develop the skills to identify situations that could make diabetes management more difficult.

DID YOU KNOW?

Skipping meals and snacks, taking too much diabetes medication, engaging in physical activity and drinking too much alcohol can all cause you to experience low blood glucose problems.

TRUE OR FALSE?

Nobody has perfect diabetes management.

TRUE. You are not perfect—no one is. There **WILL** be problems and challenges. The important thing is to learn from each situation—what caused your blood glucose to go above or below target, and what you can do to improve your diabetes self-care.



Word Wall

HYPOGLYCEMIA:

Low blood glucose

HYPERGLYCEMIA:

High blood glucose

GOAL SETTING:

Choosing a specific task or activity that you want to achieve and making a plan to get there



QUICK TIPS

Do not go more than 5 hours without eating during your waking hours.

Limit your alcohol consumption. Learn how it interacts with your medications and how it affects your blood glucose. When you do drink alcoholic beverages, don't drink on an empty stomach.

When you do have a problem managing your diabetes, don't beat yourself up over it—solve it and learn from it! Talk to your healthcare provider—they can help you come up with solutions.



AADE7™ SELF-CARE BEHAVIORS

HEALTHY COPING

Diabetes can affect you physically and emotionally. Living with it every day can make you feel discouraged, stressed or even depressed. It is natural to have mixed feelings about your diabetes management and experience highs and lows. The important thing is to recognize these emotions as normal. Take steps to reduce the negative impact they could have on your self-care.

The way you deal with your emotional lows is called “coping.” There are lots of ways to cope with the upsets in your life—and not all of them are good for your health (smoking, overeating, not finding time for activity, or avoiding people and social situations).

However, there are healthy coping methods that you can use to get you through tough times (faith-based activities, exercise, meditation, enjoyable hobbies, joining a support group).

Having a support network is key to healthy coping. Be sure to develop and nurture partnerships in your personal life with your spouse, loved ones and friends. Go to group educational sessions where you can meet and relate to other people going through the same experiences. Build healthy relationships—and remember that you’re not alone.

Sometimes, emotional lows can be lengthy and have a more serious impact on your life, health, and relationships. This can be a sign of depression. Tell your diabetes educator if you:

- » Don't have interest or find pleasure in your activities.
- » Avoid discussing your diabetes with family and friends.
- » Sleep most of the day.
- » Don't see the benefit in taking care of yourself.
- » Feel like diabetes is conquering you.
- » Feel like you can't take care of yourself.



Did You Know?

Physical activity can influence your mood. If you are sad, anxious, stressed or upset, go for a walk, stand up and stretch, or take a bicycle ride. Exercise actually increases the chemicals in your brain that help make you feel good!

TRUE OR FALSE?

Nobody wants to hear about your problems. When you are feeling down, you should keep it to yourself.

FALSE. You need to talk about your emotions with friends, family, or your healthcare provider. Sometimes just talking about a problem will help you solve it...and loved ones can help you gain perspective.

QUICK TIPS

Recognize the power of positive thinking. When you are feeling down, think about your successes and feel good about the progress you've made toward a goal—even if it's just a little bit.

Find time to do something pleasurable every day.



AADE7 SELF-CARE BEHAVIORS®
REDUCING RISKS

Having diabetes puts you at a higher risk for developing other health problems. However, if you understand the risks, you can take steps now to lower your chance of diabetes-related complications.

Talk to your diabetes educator and healthcare provider about potential health issues such as kidney damage, nerve damage and vision loss. They can explain why complications happen and how they can be avoided.

But don't rely on your healthcare team to identify areas of concern—you need to play an active role in reducing your risk. Make an effort to learn about complications and consistently track your overall health. You can reduce your risks for several complications by taking these precautions:

- » Don't smoke.
- » Schedule regular medical checkups and medical tests.
- » See an ophthalmologist (eye doctor) at least once a year.
- » Keep your feet dry and clean. Look out for redness or sores, and report these to your healthcare team as soon as you find them. If you have trouble seeing the bottom of your feet, ask a family member or friend to help you.
- » Be sensitive to your body—recognize when you aren't feeling well, and contact your care team if you need help identifying the problem.

DID YOU KNOW?

Lowering your cholesterol can decrease your risk for stroke, heart attack or other circulation problems.

TRUE OR FALSE?

Controlling your diabetes can help reduce your risk for heart disease.

TRUE. If your blood glucose (sugar) or blood pressure levels are too high for too long, your blood vessels can become sticky. This makes it easier for blood clots to form...which can lead to a heart attack or stroke.

 **Word Wall**

BLOOD PRESSURE:

The amount of pressure that is applied to your arteries when blood is pumped through your body

CHOLESTEROL:

A waxy substance that is in your blood that exists in two types: LDL ("bad") and HDL ("good")

COMPLICATION:

Another health problem that can happen when you have diabetes

HYPERTENSION:

When your blood pressure is higher than 140/90



Keep a Personal Care Record or a wallet card that lists all of the tests you should be regularly getting and the targets for each.

Sleep apnea affects more than half of people with diabetes and most don't know it. If you snore loudly or feel sluggish and tired during the day, ask your diabetes educator to screen you for sleep apnea.

Appendix K

The Harbor logo features the word "Harbor" in a blue serif font. To the right of the text is a solid blue rectangular bar. Below the logo and bar is a thin orange horizontal line.

Harbor

March 6, 2020

University of Toledo
Institutional Review Board
Toledo, OH 43606

To Whom It May Concern:

The Research Committee at Harbor has reviewed the research proposal for Brooke Tullis's study entitled, *Impact of Diabetes Self-Management Education on Adults with Diabetes and Mental Illness* and have approved her project.

Harbor is pleased to support this worthwhile research and looks forward to the benefits of the information that will be provided. If I can be of any further assistance please feel free to contact me at 567-455-5343.

Sincerely,

Valerie Moyer, Ph.D.
Vice President, Quality Improvement, Grant Development, and SUD
Harbor