Assessment of Self-Care and Education in Patients with Type 2 Diabetes Mellitus

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Abstract

Background and Significance: The annual cost of diagnosed type 2 diabetes mellitus (DM2) in the United States is $327 billion, with individuals with DM2 spending 2.3 times more on health care than individuals without DM2. Education, such as Diabetes Self-Management Education and Support (DSMES) programs, and self-care support, utilizing tools such as the Summary of Diabetes Self-Care Activities (SDSCA) Measure, are the cornerstones of improving care and outcomes for patients with DM2. **Purpose:** The purpose of this quality improvement project was to implement a standardized self-care assessment and educational intervention for a mid-Michigan internal medicine clinic's adult patient population over 18 years of age with DM2 and hemoglobin A1c (HbA1c) greater than 9% and improve patient self-care. **Methods:** The Plan, Do, Act, Study (PDSA) Cycle and the Chronic Care Model were used as a framework to guide the project. Eligible participants were identified by clinic staff and received self-care education. **Evaluation:** The validated SDSCA tool was utilized to assess self-care pre- and post-educational intervention. A two-tailed paired t-test was then performed to compare pre- and post-intervention scores. **Outcomes:** Of 25 eligible patients in the clinic, 13 patients participated in the initial phase with 3 patients lost to follow-up, leaving 10 patients included in data analysis. A statistically significant improvement was seen in DM2 self-care with mean scores increasing from 4.1 days/week to 4.8 days/week ($t = -6.5$, $p < 0.01$). **Implications/Conclusion:** Identification of specific areas of patient educational needs can improve self-care in patients with DM2 and improve their overall health outcomes.

Keywords: type two diabetes mellitus, type 2 diabetes, t2dm, DM2, education, self-care, Summary of Diabetes Self-Care Activities Measure, SDSCA

Assessment of Self-Care and Education in Patients with Type 2 Diabetes Mellitus

Patients with uncontrolled Type 2 Diabetes Mellitus (DM2) are at risk for poor healthcare outcomes (American Diabetes Association [ADA], 2021a), and have significantly higher healthcare costs than individuals without DM2 (ADA, 2021b). Healthy People 2030 (U.S. Department of Health and Human Services [USDHHS], 2020) has a goal of reducing the number of individuals with elevated hemoglobin A1c (HbA1c) as a means to improving patient health and outcomes. Self-care self-efficacy and education are key interventions to create positive change toward achieving this goal. Healthcare providers and practices are the facilitators of direct care and treatment for diabetes, as well as delivery of education and monitoring of patient self-care. The purpose of this project is to develop a workflow pathway to improving education and self-care for adult patients with DM2 and elevated HbA1c in a primary care setting.

Background and Significance

In the United States (U.S.), over 34 million people have diabetes, with approximately 90-95% of those having DM2 (Centers for Disease Control and Prevention [CDC], 2019). In 2016, the diabetes prevalence median in the U.S. was 9.5%, while the diabetes prevalence median in the state of Michigan was 9.8% (Michigan Department of Health and Human Services [MDHSS], 2019). The estimated diabetes prevalence broken down by age in Michigan is 2.9% among adults 18-44 years, 13.5% among adults 45-64 years, and 22.6% among adults 65 years and older (MDHSS, 2019). Data shows males have a higher diabetes prevalence than females (MDHSS, 2019). Additionally, diabetes prevalence is 1.4 times higher in non-Hispanic Black adults than non-Hispanic White adults and two times higher in adults with disability than those without disability (MDHSS, 2019). More specifically, in Ingham County from 2011-2013, diabetes prevalence was 8.24% (Ingham County Health Department, 2018). Rates per 10,000

adults for preventable hospitalizations due to diabetes in 2016 in Michigan were 34.4%, and in

Ingham County were 30.9% (Healthy! Capital Counties, 2018).

According to the American Diabetes Association (2021b), the annual cost of diagnosed

diabetes in the United States is $327 billion, with 30% being spent for hospitalizations, 30%

being spent for diabetic complications and treatments, and 15% on anti-diabetic agents and

supplies (ADA, 2021b). Individuals with diabetes spend 2.3 times more on health care than

individuals without diabetes (ADA, 2021b). Overall, 1 in 7 healthcare dollars is spent to treat

diabetes and diabetic complications (ADA, 2021b). Additionally, indirect costs of diabetes

include increased absenteeism, decreased work productivity, inability to work due to disease-

related disability, and early mortality (ADA, 2021b).

Education and self-care support are the cornerstones of improving care and outcomes for

patients with DM2. Under ideal circumstances, Diabetes Self-Management Education and

Support (DSMES) is utilized, as it is the recommended standard of care across many

professional organizations (Beck et al., 2017; Powers et al., 2020). However, these programs can

be lengthy and intensive and there are often many barriers to patients attending these specialized

programs such as lack of access, financial or transportation limitations, and even lack of

willingness or desire by the patient (K. Richardson-Aubrey, personal communication, June 16,

2021). At the core of this educational program is support for self-care as patients are their own

best advocate and caregiver. Eller, Lev, Yuan, and Watkins (2018) assert that interventions

targeting self-care self-efficacy can grow patients' skills in this area, reduce health care costs,

and improve overall patient outcomes. As such, educational interventions that do not utilize

DSMES certified programs should still focus on evaluating and supporting patient self-care

abilities.

Additionally, when determining the best patient population on which to focus, HbA1c cutoffs can be a useful consideration. HbA1c, an indicator of how well an DM2 is being managed over the course of a three-month period, should be maintained at or below 6.5% (ADA, 2021d). Individuals whose HbA1c is chronically over 6.5% are at risk for DM2 a variety of complications such as diabetic ketoacidosis, neuropathy, kidney disease, cardiovascular disease, hypertension, stroke, and skin, eye, and foot complications (ADA, 2021a). Clinical trials have shown that individuals with a HbA1c of greater than 9% may require more treatment and have an increased risk from complications than individuals whose HbA1c is less than 9% (USDHHS, 2020). As such, Healthy People 2030 has identified the goal of reducing the percentage of adults who have a HbA1c greater than 9% (USDHHS, 2020).

Problem Statement and Clinical Question

A mid-Michigan internal medicine clinic identified a need to improve self-care and education in their adult patient population with DM2 (K. Richardson-Aubrey, personal communication, June 4, 2021). Current educational practices within the clinic are inconsistent across providers, and there is a lack of specific, consistent education provided to patients (K. Richardson-Aubrey, personal communication, June 4, 2021). Clinic staff feel that patients with DM2 would have improved outcomes in areas such as medication adherence, exercise, nutrition, and foot assessment, if specific, consistent education was provided (K. Richardson-Aubrey, personal communication, June 4, 2021). In addition to providing specific, consistent education, utilization of a validated self- care focused self-efficacy tool, such as the Summary of Diabetes Self-Care Activities Measure (SDSCA), would be useful in determining areas in which patients need additional education (Toobert, Hampson, & Glasgow, 2000).

Description of Clinic

The clinic identifies its purpose through their mission "to offer cost effective, quality patient care and other services to the people of the Capital city and the mid-Michigan area" (Capital Internal Medicine Associates [CIMA], n.d.). Their main office is centrally located in Lansing, Michigan, with satellite offices that cover a range of specialties around central Michigan. Their outreach is vast, actively treating a population of almost 40,000 patients across all offices. Approximately 14,000 of those patients are seen at the clinic's main location, which is the planned site of intervention (A. Ryal, personal communication, August 2, 2021). They care for a diverse subset of patients who represent male and female sexes almost equally, with ages ranging across the lifespan. Insurance breakdowns for this group include approximately 1% uninsured, 15% Medicaid, 39% commercial plans, and 45% Medicare (A. Ryal, personal communication, August 2, 2021). More specifically, the identified population of adult patients with DM2 with HbA1c >9% in the past year includes 174 patients (A. Ryal, personal communication, August 2, 2021), which provides a scope of estimated patients who could possibly participate in the proposed intervention depending on the timing of their next appointment. Over the course of the project intervention period, project leads estimate one quarter, or approximately 45, patients will be seen in the clinic for a diabetes follow-up appointment.

Within the main clinic office, a wide variety of professionals ensure access to the best care possible. Providers represent a variety of backgrounds including eight doctors of osteopathic medicine, five doctors of human medicine, three physician assistants, and two nurse practitioners (A. Ryal, personal communication, June 16, 2021). Additional office staff include one registered nurse, one licensed practical nurse, two nurse care managers (CMs), twelve medical assistants (MAs), seven receptionists, four schedulers, five quality control specialists, and three referral

specialists (A. Ryal, personal communication, June 16, 2021). Together, these providers and staff

develop and implement processes to achieve high quality, cost-effective care through

competitive pricing, enforcement of high care standards, and close monitoring of performance

metrics and patient outcomes (A. Ryal, personal communication, June 16, 2021). More

specifically, the quality control specialists, led by the Director of Clinical Operations, strive to

streamline processes and monitor patterns of care implementation and outcomes (A. Ryal,

personal communication, June 16, 2021). They meet monthly to discuss goals, progress, and

planning and are looking to standardize point of care diabetes education within their main office

beginning with the development of this new intervention (A. Ryal, personal communication,

June 16, 2021).

Organizational Assessment "Gap Analysis" of Project Site

Utilizing information provided by the community partner and assessment completed

during a clinic site visit, a gap analysis in the form of a fishbone diagram (Appendix A) was

completed to determine where process barriers were occurring within the clinic. A standardized

approach to providing in-clinic assessment of patient self-care in relation to management of

DM2, patient education, and post-interventional clinic initiated patient contact may improve

current barriers.

Strengths, Weaknesses, Opportunities, and Threats

A strengths, weakness, opportunities, and threats (SWOT) assessment was performed to

determine areas within the clinic that may contribute to the success of this project, as well as

areas within the clinic that may cause setbacks to this project. Appendix B provides the SWOT

analysis for this project.

Strengths identified for the clinic include seasoned and knowledgeable clinic staff, adequate staffing, and resources for implementation. Weaknesses identified for the clinic include many practice locations causing inconsistencies across clinic sites, no synchronous process across sites or providers, resistance to change by providers and staff, difficulty in process change roll out due to large staff buy-in, providers wanting control over education given to patients, short provider appointments, and lack of additional staff to help implement and maintain educational process changes.

Opportunities supporting this process change include multiple certified diabetic education programs in area for referral and public transportation available within city. Threats include staff turnover and ongoing COVID-19 pandemic. Slow acceptance and hesitancy to accept change may also be a threat to success.

Purpose of the Project

Support of self-care behaviors through a standardized educational process maximizes patient adherence to a diabetes plan of care, which subsequently improves diabetic health outcomes. Therefore, the purpose of this quality improvement project was to implement a standardized self-care assessment and educational intervention for the clinic's adult patients over 18 years of age with DM2 and HbA1c greater than 9%. This process change also developed consistency across providers of diabetes follow-up visits, as well as a standardized office workflow.

Evidence-Based Practice and Quality Improvement Models

Plan, Do, Study, Act (PDSA) cycle is an evidence based, scientific method for making change (Institute for Healthcare Improvement [IHI], 2020a). PDSA provides a model for making change within a healthcare environment, asking questions such as "what are we trying to accomplish?" (IHI, 2020a) or "what change can we make that will result in improvement?" (IHI,

2020a). The Chronic Care Model exemplifies the PDSA cycle by identifying six fundamental areas that create a system to manage chronic disease (IHI, 2020b). These six fundamental areas are self-management support, delivery system design, decision support, clinical information systems, organization of health care, and community (IHI, 2020b). Additionally, it is important that development of productive interactions occurs between patients with chronic disease and providers assisting these patients through education and support (IHI, 2020b).

Review of the Literature

Several searches were performed using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PubMed of the U.S. National Library of Medicine National Institutes of Health (Appendix C). The first search completed was to determine what self-efficacy tools were available. CINAHL search #1 utilized the Boolean/Phrases self-efficacy AND type 2 diabetes OR type 2 diabetes mellitus OR t2dm AND assessment tools OR assessment method OR assessing with additional limiters of English Language, Research Article, Peer Reviewed, 2016-2021, and All adult, finding 21 total results. PUBMED search #1 used the terms self-efficacy AND type 2 diabetes OR type 2 diabetes mellitus OR t2dm AND assessment tools OR assessment method OR assessing in the query box with additional filters of Last 5 years, English Language, Adults: 19+ years, and Free Full Text, finding 95 total results.

Based on the clinic needs and review of the tools identified in CINAHL search #1 and PUBMED search #1, the Summary of Diabetes Self-Care Activities (Toobert, et al., 2000) tool was identified as a validated, reading level appropriate assessment tool which would provide insight into diabetic indicator areas on which the clinic's patients need additional education.

Following selection of the SDSCA tool, a second search was completed to synthesize the literature on use of this tool and its efficacy in relation to an educational intervention. CINAHL search #2 utilized the Boolean/Phrases Summary of Diabetes Self-Care Activities AND

education with additional limiters of English Language, Research Article, Peer Reviewed, 2016-

2021, and All adult, finding 13 total results. PUBMED search #2 used the search terms Summary

of Diabetes Self-Care Activities AND education in the query box with additional filters of Last 5

years, English Language, Adults: 19+ years, and Free Full Text, finding 13 total results. Articles

included in the literature review were narrowed from 26 articles to 8 articles based on

elimination of duplicate articles between the CINAHL and PUBMED searches, and content in

the abstract, such as focus on type 1 diabetes mellitus, use of a different self-efficacy tool, or lack

of educational intervention. In reviewing the literature found in this search, a few themes

emerged that hold relevancy to this intervention. A literature synthesis table can be found in

Appendix D.

SDSCA Utilization

　　All articles selected for review utilized the SDSCA to varying degrees. Of the eight

articles reviewed, six articles, Bauer et al. (2018), Formosa & Muscat (2016), GB & Premkumar

(2016), Jiang et al. (2019), Marques et al. (2019), and Zheng et al. (2019) used the SDSCA tool

in its entirety to assess patient behaviors with two of those using the subscales individually as

well. Those using the entire SDSCA tool, such as GB & Premkumar (2016) and Marques et al.

(2019), typically utilized the SDSCA as a pre-intervention and post-intervention test to

determine overall changes in self-care. Bauer et al. (2018) and Formosa & Muscat (2016) used

the SDSCA in its entirety to assess patient self-care behaviors then used the subscale scores to

develop appropriate interventions. Only one of the eight articles, Afaya et al. (2020), used the

subscales of the SDSCA to assess patient self-care behaviors, excluding the smoking subscale as

the authors did not feel smoking was a self-care behavior (Afaya et al., 2020). The last of the

eight articles, the systematic review by Nogueira, Otuyama, Rocha, & Pinto (2020), found four

articles (Jahangard-Rafsanjani et al., 2015; Jarab et al., 2012; Korcegez, Sancar, & Demirkan, 2017; Wishah, Al-Khawaldeh, & Albsoul, 2014) that used the SDSCA as a whole to assess patient self-care behaviors at intervals, such as baseline, three months, and 6 months, through their research. Overall, the literature shows the SDSCA is a flexible tool for self-care assessment and can be utilized in its entirety or as subscales to provide a more focused intervention.

Educational Interventions

The next theme found in the literature was that a variety of educational interventions can successfully be used to teach patients about diabetes self-care and facilitate changes in outcomes. Individually based interventions were the most common approach across the literature and included a range of tools and methods to target specific weaknesses (Afaya et al., 2020; Bauer et al., 2018; Formosa & Muscat, 2016; GB & Premkumar, 2016; Nogueira et al., 2020; Zheng et al., 2019). Some of these interventions were truly individualized, such as those reviewed by Nogueira et al. (2020) wherein pharmacists provided medication guidance to fit patients' needs. Whereas Bauer et al. (2018), used an individual approach with a universal intervention, as they sent standardized text messages to each patient with ongoing educational guidance.

Alternatively, group-based interventions were also represented in the literature. Group based classes were beneficial in that they incorporated peer support and reached a broader patient base for consistent and universal education (Marques et al., 2019; Zheng et al., 2019). This option also provides flexibility in designing an intervention plan, as it can be used independently or in conjunction with individual education. For example, Marques et al. (2019) implemented a fully group-based educational program for older adults with resultant improvements in diet and foot care scores on the SDSCA. Zheng et al. (2019) utilized a combination of group didactic courses along with individualized exercise programs to improve SDSCA self-care scores.

Another finding within the literature was that successful interventions could be implemented by a variety of healthcare professionals. Some of the research did not overtly specify who the purveyor of education was but indicated a standard of care that appears to be referring to a provider such as a physician (Afaya et al., 2020; Bauer et al., 2018; Formosa & Muscat, 2016; Zheng et al., 2019). Nurses have also demonstrated teaching to successful outcomes, as illustrated by GB & Premkumar (2016), while Marques et al. (2019) even utilized nursing students alongside registered nurses and researchers to improve outcomes in their elderly population. Jiang et al. (2019) benefited from a combination of physicians and nurses to guide patient education. Finally, Nogueira et al. (2020) reviewed various studies that utilized pharmacists as providers of education. In each instance, valuable outcomes, self-care changes, and benefits were realized as various healthcare professionals demonstrated an ability to educate and influence patient knowledge and behaviors.

Education delivery was successful in many forms. The most common format for education delivery was by providers during treatment in healthcare settings (Afaya et al., 2020; Formosa & Muscat, 2016; GB & Premkumar, 2016; Jiang et al., 2019; Zheng et al., 2019). This is often the baseline care and source of education for most patients. Formal and structured education classes were also beneficial for some patients, but typically lasted longer in duration and required greater commitment from the patient to attend and actively participate (Marques et al., 2019; Zheng et al., 2019). In the systematic review by Nogueira et al. (2020), some successful educational delivery methods included providing educational handouts with relevant information to supplement the verbal educational process, as well as follow-up phone calls to answer additional questions and clarify points of confusion. Finally, Bauer et al. (2018) scheduled text messages to reinforce teaching from in-person appointments.

Theory Utilization

The final theme found in the literature highlights the benefits and necessity of grounding any intervention in supportive theory. Of the eight articles reviewed, two were found to support the use of behavior change theory, in addition to the SDSCA tool to make positive behavior changes in patients with DM2. Jiang et al. (2019) utilized the Social Cognitive Theory to support the idea that changes in self-care self-efficacy and behavior require knowledge of DM2 to occur (Jiang et al., 2019). Formosa & Muscat (2016) did not use a behavior change theory in their article, however stated that use of behavior theories while developing education interventions in the primary care setting may translate into "improved care, reducing long-term complications, and better quality of life" (Formosa & Muscat, 2016, p352).

Summary of the Literature

To initiate any self-care self-efficacy change, it is important to determine the best strategies supporting change prior to implementation of any intervention. Research shows that the SDSCA tool can be utilized in its entirety (Bauer et al., 2018; Formosa & Muscat, 2016; GB & Premkumar, 2016; Jiang et al., 2019; Marques et al., 2019; Zheng et al., 2019) to assess a patient's overall self-care self-efficacy behaviors, as well as broken into subscales to provide a specialized intervention (Bauer et al., 2018; Formosa & Muscat, 2016; Afaya et al., 2020). Educational interventions can range from individualized education, group-based education programs, and can be performed by a variety of healthcare professionals, such as providers, nurses, and pharmacists. Additionally, education can take many forms, such as during provider appointments, formal group education, educational flyers, and text messages (Afaya et al., 2020; Bauer et al., 2018; Formosa & Muscat, 2016; GB & Premkumar, 2016; Jiang et al., 2019; Marques et al., 2019; Nogueira et al., 2020; Zheng et al., 2019). Finally, use of a behavior

change theory when developing any intervention can improve the overall outcomes of said

intervention (Jiang et al., 2019; Formosa & Muscat, 2016).

<div align="center">**Methods**</div>

The overall goals of this project were twofold. The first goal was to improve diabetes

knowledge and relevant self-care through evidence-based assessment and education during

diabetic follow-up appointments with the patients' primary care providers (PCPs). This was

achieved by utilizing the Summary of Diabetes Self-Care Activities (SDSCA) tool to assess

educational needs for the highest risk patients with HbA1c greater than 9%, followed by a

standardized educational handout that was reviewed by the provider with the patient. The second

goal was to create a standardized process for educating patients with DM2, as the clinic had

identified that there was no consistent process for identifying or providing DM2 education across

their providers or patients (K. Richardson-Aubrey, personal communication, June 4, 2021). An

implementation timeline (Appendix E) shows a tentative start date for data collection of mid-

September 2021 with completion of data collection in mid-December 2021.

Ethical Considerations and Protection of Human Subjects

Michigan State University Internal Review Board (IRB) approval was obtained prior to

initiating the Doctor of Nursing Practice (DNP) Project. Approval verification can be found in

Appendix F. The following statement was included on the SDSCA tool, providing participants

with informed consent, "By completing this assessment tool, I give my consent to participate in

the 'Assessment of Self-Care and Education in Patients with Type 2 Diabetes Mellitus' project

performed by Michigan State University Doctor of Nursing Practice students." Project leads do

not have access to E-Clinical Works, the EHR system used by the clinic, and all data provided by

the clinic to DNP students was deidentified prior to performance of data synthesis.

Project Site and Population

The clinic's main is located in southeast Lansing, Michigan. The estimated population of Lansing in July 2019 was 118,210, with 48.1% male and 51.9% female (United States Census Bureau [USCB], 2019). The age breakdown estimates 22.6% of the population is under 18 years, 65.5% of the population is 19 to 64 years, and 11.9% of the population is 65+ years (USCB, 2019). Demographic breakdowns show 61% of the population identifies themselves as White alone, 23.3% identifies as Black alone, 12.4% as Hispanic alone, 4.4% as Asian alone, 0.7% as American Indian/Alaskan Native alone, and 8.1% as two or more races (USCB, 2019). The median household income in Lansing from 2015-2019 was $41,674, with 24.6% of the population falling below the poverty line (USCB, 2019).

In the last 24 months, the clinic has provided primary care to 13,089 patients, 6,332 male and 6,757 female (A. Ryal, personal communication, August 2, 2021). The clinic patient population further breaks down into the following groups: 981 ages 0-18, 1,510 ages 19-29, 1,767 ages 30-39, 1,824 ages 40-49, 2,288 ages 50-59, and 4,107 ages 65+ (A. Ryal, personal communication, August 2, 2021). In the past 12 months, the clinic has seen 2,234 patients with DM2 with 325 having an HbA1c 7.0-7.9, with 157 having an HbA1c 8.0-8.9, with 84 having an HbA1c 9.0-9.9, and with 90 having an HbA1c over 10.0 (A. Ryal, personal communication, August 2, 2021). A total of 147 referrals were made to McLaren DSMES programs in the past year, while only 35 referrals were made to Sparrow DSMES programs (A. Ryal, personal communication, August 2, 2021).

The clinic is affiliated with McLaren Health Care Corporation – Greater Lansing campus, where the clinic providers run the admission and discharge service (A. Ryal, personal communications June 16, 2021). Additionally, the clinic participates with the McLaren High Performance Network's Accountable Care Organizations (ACO) and Physician Group Incentive

Program (PGIP) group (McLaren, 2021), which is comprised of health care providers who voluntarily work together to provide coordinated, high quality patient care (Centers for Medicare and Medicaid Services [CMS], 2021).

The clinic patients participating in this project were comprised of individuals from four willing providers with an HbA1c above 9%, with exclusion criteria based only on the patient's unwillingness to participate. Stakeholders include the clinic, Michigan State University, McLaren Health Care Corporation – Greater Lansing campus, insurance companies, and patients (K. Richardson-Aubrey, personal communication, August 13, 2021).

Setting Facilitators and Barriers

The clinic currently staffs 18 providers, each working with an MA assigned to assist them daily (A. Ryal, personal communication, June 16, 2021). Care Managers and quality specialists work together to ensure patient follow-ups and transitions of care occur based on provider order and/or patient needs. Clinic resources and services are extensive and demonstrate the willingness of the clinic to facilitate best care for their patients. For example, the clinic provides the following services on-site:

- Preventative Care Including Wellness and Physical Exams
- Gynecological Exams and Procedures
- Minor Office Surgical Procedures
- Immunizations
- Family Medicine and Pediatrics
- Well Child Physicals including Newborn
- Pediatric Sports/School physicals
- Pediatric Immunizations
- Wart Removal
- Asthma and Allergy Care
- Vision Screening
- Nutrition and Childhood Obesity
- Minor Wound and Burn Care
- Behavior and Developmental Care
- Conners Scale for Assessing ADHD

- Bone Mineral Density Testing
- X-Ray
- Osteopathic Manipulation Testing (OMT)
- Onsite Ultrasound
- Onsite Laboratory Services by Sparrow Hospital
- Onsite Pharmacy Services by Central Pharmacy
- Aesthetic Services
  (CIMA, n.d.)

A letter of support was obtained from the clinics Director of Clinical Operations, as well as the Incentive Management and Quality Control lead (Appendix G) prior to initiation of the intervention. The support of these clinic members, as well as the support of CMs and quality specialists, helped facilitate this intervention and process change. As stated above, barriers were addressed utilizing the PDSA cycle and included staff buy-in, implementation limitations due to ongoing outbreaks related to the Covid-19 pandemic, and transition of deidentified data from the clinic staff to project leads. Further explanation of the PDSA cycle for this project is described in greater detail within the PDSA cycle section below.

The Intervention and Data Collection Procedure

The intervention and data collection process are outlined in Appendix H. The first step in the process was to provide education on the SDSCA scale and new patient education process to the clinic staff. Education was provided via review of the SDSCA scale and ADA educational tools which patients were to receive. Education on scoring of the SDSCA scale along with how the MA selects the ADA educational handout was provided via zoom calls in August and September 2021.

Following completion of staff education, patients whose HbA1c was greater than 9% were identified and clinic staff determined if they had a diabetes follow-up appointment scheduled during the three-month intervention period. Most of these patients had an appointment already scheduled, as patients with uncontrolled DM2 should see their PCPs every three to six

months until their HbA1c is better controlled (ADA, 2021c). The clinic's quality specialists ran a

report from E-Clinical Work, the electronic health record (EHR) system used by the clinic, and

cross checked the list with the scheduling system. Any patients who were not scheduled within

the intervention period were contacted by the quality specialists to determine if an appointment

could be moved or created to fit within the designated timeframe.

The next step in the process was to facilitate the intervention at patient appointments. The

quality specialists set up an alert within the EHR that signaled the MAs to incoming patients who

met the criteria for the intervention. Upon patient arrival for an appointment, the MA gave the

patient the abbreviated SDSCA assessment tool (Appendix I) with consent statement to

complete, along with several additional questions to assess previous participation in formal

diabetes education or referral to endocrinologist for DM2 education (Appendix J). After the

questionnaire was filled out, the MA calculated the scores and determined which subscale was

the weakest area of knowledge for the patient. The subscales assess self-care in the areas of diet,

exercise, blood glucose testing, foot care, smoking, and medication adherence (Toobert et al.,

2000). After determining the greatest area of need, the MA provided the patient with the

corresponding pre-printed ADA educational handout and alerted the provider to the topic.

Although not originally planned, some patients received education for multiple subscales as

determined by staff. The provider then facilitated education during the appointment in

accordance with these handouts. Following completion of the appointment and the educational

intervention, the provider placed all paperwork collected from the patient in a collective bin,

located in a secure, employee only area, to be scanned and uploaded into the EHR. This practice

was already in place and is consistently used throughout the clinic practice (A. Ryal, personal

communication, August 13, 2021). Project leads did not have access to the bin.

The final step in the intervention process was to complete follow-up phone calls with the patients to assess any change in self-care behaviors. Again, the quality specialists created an alert within the EHR that signaled to the CMs and quality specialists that a phone call was warranted. The CMs and quality specialists rotated responsibility for these calls so that the work was distributed evenly and did not create undue burden on any single group within the clinic practice. This process occurred 7-14 days after the patient's appointment and included a repeat delivery of the full SDSCA tool via phone. Additional questions that were covered during this phone call assessed patient opinion of the new educational process and any suggestions or needs they may have to improve self-care related to their diabetes. These additional questions, developed by the project leads and clinic staff, determined the extent of diabetes education the patient has received in the past and what direction patient education might need to go in the future, as well as patient feedback on the flow of this new education process. After the intervention period was complete, the quality specialists downloaded the deidentified data that was collected and sent it to the project leads for analysis.

PDSA Cycle

The Plan, Do, Study, Act (PDSA) cycle (IHI, 2020a) was utilized in this project as an evidence-based, scientific method for enacting change. The initial Plan and Do stages of this project are described above as the project design process and implementation phases were outlined. During implementation, project leads enacted the Study and Act stages as they monitored for unanticipated problems and developed solutions as needed. The first modifications came as a result of the Covid-19 pandemic as project initiation was delayed and limitations were placed on project leads' ability to be present at the clinic on the first day of project implementation. While the anticipated start date was planned for mid-September, the first patient

to receive the intervention was actually seen on October 21st, 2021 (A. Ryal, personal

communication, October 28, 2021). Throughout the implementation phase, delays continued as

patient appointments were rescheduled due to ongoing illness among the clinic staff and patients.

Upon initiation of the intervention with patients, a few issues arose directly with patients

not completing the full questionnaire. In one instance, the MA gave the patient the full packet of

educational material and in another the patient simply received the smoking cessation education

material (A. Ryal, personal communication, October 28, 2021). Another solution that was

developed included the CMs completing the questionnaire with patients upon the two-week

follow-up call. Additionally, some patients chose not to participate at all and indicated feeling

overwhelmed by having to manage their chronic disease or simply needing more time before

feeling ready to commit to change (A. Ryal, personal communication, November 18, 2021).

Further assessment determined that language barriers did not play a role in any of the

uncompleted questionnaires.

Aside from these instances, the intervention went smoothly, and patient data was

collected as expected. Workflow unfolded as anticipated, with staff indicating that the

intervention fit smoothly within processes they already had in place (A. Ryal, personal

communication, November 18, 2021). An unanticipated benefit of this new process was an

increase in referrals to endocrinology specialists and formal diabetes education programs

resulting from the guided discussions occurring between patients and providers (A. Ryal,

personal communication, November 18, 2021). This news was encouraging and determined no

loss or detriment to project integrity was incurred by virtue of project leads being limited in

ability to be onsite during outbreaks of illness among clinic staff.

Measurement Instruments and Tools

The SDSCA assesses elements of self-care related to DM2 including diet, exercise, blood glucose testing, foot care, medication adherence, and smoking (Toobert et al., 2000). The extended tool offers 25 questions for gathering data; however, the authors support the utilization of subscales separately to support the needs of the project (Oregon Research Institute, n.d.; Toobert et al., 2000). Individualized use of the desired subscales for intervention development is evident within the literature as well, as described in the literature synthesis above (Bauer et al., 2018; Formosa & Muscat, 2016). Toobert et al. (2000) summarizes test and subscale validity and reliability across seven studies that utilized progressive versions of the SDSCA across a variety of settings and participants. Of note, the final version of the SDSCA tool was developed to maximize outcomes found across the seven studies including internal consistency, variability across subscales, stability of scales over time, predictive validity, sensitivity to behavior change, scoring simplicity, and utility for investigators and clinicians (Toobert et al., 2000). For the purposes of this project, 10 questions covering six subscales were utilized to assess educational needs. These subscales were chosen by project leads and clinic staff, as the clinic tracks these metrics on all patients with DM2 in their clinic. Permission to use the SDSCA assessment was obtained (Appendix K).

The educational tools correlated with the area of need found by the SDSCA assessment. The ADA offers free patient education handouts (Appendix L) to help guide conversations between providers and patients and can be utilized as an ongoing reference for the patient. Separate handouts were chosen from the ADA website to correlate with each subscale of the SDSCA such that a low score on diet would necessitate use of the diet related handout and facilitate discussion on diet education, needs, and plans moving forward. Additional questions

were determined by the project leads and the clinic to gauge possible educational needs in the future.

Cost-Benefit Analysis and Budget

Minimal cost was incurred for the clinic in relation to this project. The Incentive Management and Quality Control lead created a notification process within the EHR based on HbA1c >9% and a template utilized by the CMs and other quality specialists during follow-up phone calls. Following approval from the IRB, project leads provided education to staff involved in the intervention over zoom. No additional cost related to staff wages were incurred for this activity as it was incorporated into preplanned work hours. Approximately 1 hour of education was provided by the project leads. Although both are registered nurses, no additional cost was charged for this time as it is attributed to course project hours as graduate students. The SDSCA and educational materials provided to patients occurred during an already scheduled DM2 follow-up appointment. The SDSCA is free to use for educational purposes, incurring no additional cost to this project. Printing of the SDSCA tool and educational materials, which are free online from the ADA, occurred in the clinic at a cost of approximately $0.04 per color page (A. Ryal, personal communication, August 13, 2021).

Evaluation and Outcome Measures

The success of this project was evaluated by comparing the initial and follow-up SDSCA overall scores. Improvement in the scores indicate that the education that occurred was successful in improving patient diabetes related self-care. Additionally, the process change was assessed by determining if there was an increase in the percentage of the clinic's patients with DM2 that are receiving a standardized educational process. The additional questions after the

SDSCA as asked by CMs or quality specialists were designed to help the clinic determine future directions on types of education they may want to provide.

Data Analysis

Deidentified data was collected from the clinic in bulk at the end of the implementation phase. Although initial plans were to collect data on a biweekly basis, this was not feasible due to the manpower burdens placed on the clinic related to the Covid-19 pandemic, as described in our PDSA cycle above. There was a slight modification to the goal regarding comparison of subscale scores. Initial plans considered an increase in subscale scores across 15% of patients to indicate success of the intervention. However, fewer patients participated than expected, and there was more overlap in education across subscales than anticipated. As such, comparison of means across the pre- and post-intervention groups by use of a two-tailed paired t-test was deemed to be a more appropriate analysis. Regarding the desired outcome of increasing diabetic education via workflow changes, determination of success remained at a goal of 50% of patient interactions utilizing of the new procedure to increase in patient education compared to no intervention or consistent education procedure.

Data showed that 25 patients were eligible to participate during the designated timeframe, while only 13 patients chose to participate in the initial phase of the intervention. As such, 52% of eligible patients participated in the new procedure, just exceeding the 50% target. Three of the participants were then lost to follow-up upon post-intervention phone call by CMs, resulting in n=10 for final pre- and post-intervention score analyses. The group pre-intervention mean was 4.1 days per week, while post-intervention was 4.8 days per week. Data indicated a statistically significant improvement in days per week that patients engaged in self-care behavior ($t = -6.5$, $p < 0.01$). These results met the two primary goals of the project, indicating a successful outcome

of the overall plan and intervention. Additionally, the supplementary questions developed to

ascertain patient experience and readiness for formal diabetes education showed that only two of

the 13 (15%) participants had previously attended a DSMES program. Subsequently,

involvement in this intervention led to six patient referrals total, five to DSMES and one to an

endocrinology specialist. This finding, although not a predetermined goal, was certainly

considered a positive outcome of the intervention.

Sustainability Plan

This intervention provided the clinic with information regarding the self-care behaviors

of their patients with DM2 and standardized a DM2 educational process among participating

providers at the clinic. This information can readily be utilized to continue with the changes

standardized within this project and by expanding the process to the remaining providers at the

clinic and its satellite offices. At this time, however, the clinic providers as a group do not wish

to sustain this intervention due to provider preferences and limitations on staff and physical

resources. Alternatively, the case managers have expressed appreciation for the utility of the

SDSCA tool and do wish to continue using it within their role in patient care. As such, transfer of

permission to use the SDSCA tool from the project leads to the clinic Incentive Management and

Quality Control lead is underway.

Discussion and Implications for Nursing

This project focused on standardizing a self-care assessment and educational procedure

for patients with DM2 within the clinic. Identification of specific areas of patient educational

needs can improve self-care in patients with DM2 and improve their overall health outcomes

(Afaya et al., 2020; Bauer et al., 2018; GB & Premkum, 2016; Jiang et al., 2019; Nogueria et al.,

2020; Zheng et al., 2019). The information collected in the additional questions asked in the

initial and follow-up assessments provided the clinic with valuable information upon which they

could enhance the in-clinic diabetic educational program or develop a plan for increasing

referrals to outside formal diabetes education programs. The success of this program offers the

clinic a standardized diabetes education process, which can be expanded to providers across the

clinic network and patients with HbA1c below 9% to be used universally across the population

of patients with DM2. Additionally, patients who benefited from this intervention demonstrated

an improvement in self-care behaviors which will ultimately improve diabetes related outcomes

and reduce subsequent complications.

Conclusion

While DSMES education remains the gold standard for DM2 education in the U.S. (Beck

et al., 2017; Powers et al., 2020), it is not always feasible for patients with DM2 to participate in

this type of education. Self-care support is at the core of DSMES education (Beck et al., 2017;

Powers et al., 2020) and interventions that focus on improving self-care self-efficacy can

improve patient outcomes (Eller et al., 2018). Healthy People 2030 has an identified goal of

reducing the percentage of adults who have a HbA1c greater than 9% (USDHHS, 2020),

however it is important to focus on the self-care self-efficacy of all patients with DM2. By

focusing on assessing self-care self-efficacy and providing standardized education to patients

with DM2, we can reduce further complications for these patients (ADA, 2021a) and improve

their control of chronic disease.

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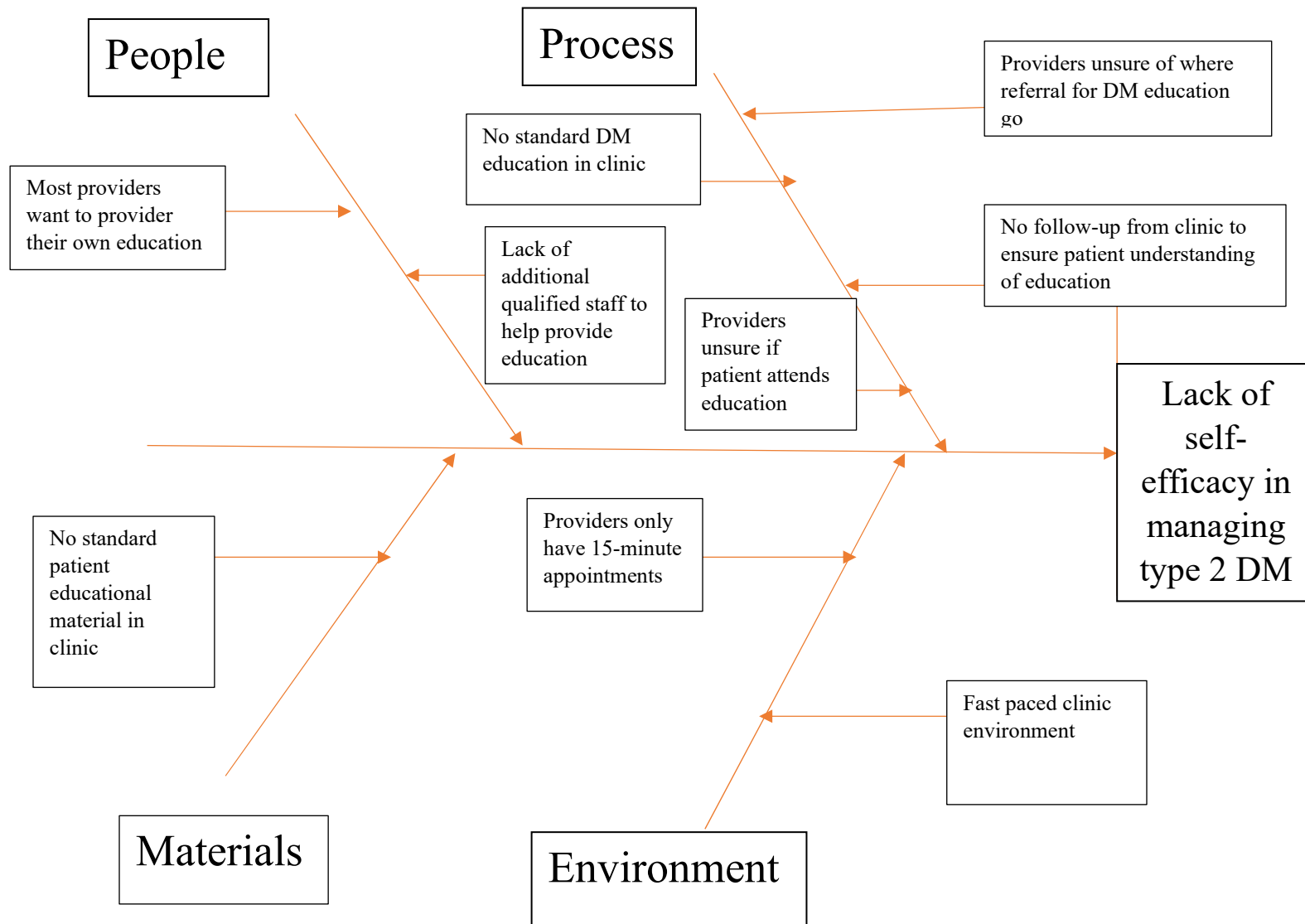https://www.census.gov/quickfacts/lansingcitymichigan

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Appendix A

Gap Analysis: Fishbone Diagram

People

Most providers want to provider their own education

No standard patient educational material in clinic

Materials

Process

No standard DM education in clinic

Lack of additional qualified staff to help provide education

Providers unsure if patient attends education

Providers only have 15-minute appointments

Environment

Providers unsure of where referral for DM education go

No follow-up from clinic to ensure patient understanding of education

Lack of self-efficacy in managing type 2 DM

Fast paced clinic environment

Appendix B

Gap Analysis: SWOT

Strengths (Internal Factors) What are you good at? What do you do better than anyone else? What is your team good at? What will help you get there?	Weaknesses (Internal Factors) What areas do you struggle with? What areas have fewer resources?
Seasoned and knowledgeable staff Good staffing and resources for implementation	Many practice locations leads to inconsistencies across sites. No synchronous process across sites or providers Resistance to change Difficulty in process roll due to large staff needing buy-in Providers want control over education given to patients Short provider appointments Lack of additional staff to help implement and maintain educational processes
Opportunities (External Factors) What areas can you take advantage of? What are places you can grow? Where are things you can do to accomplish the task? Where are opportunities for growth?	Threats (External Factors) What are areas you should be wary of? What could derail your project? What could negatively affect your project?
Multiple certified diabetic education programs in area for referral Public transportation available within city	Staff turnover Ongoing COVID-19 pandemic

Appendix C

Literary Search Methods

Database Searched	Keywords	Limitations	Number of Results
CINAHL #1	self-efficacy AND type 2 diabetes or type 2 diabetes mellitus or t2dm AND assessment tools or assessment method or assessing	English Language Research Article Peer Reviewed 2016-2021 All adult	21
PUBMED #1	self-efficacy AND type 2 diabetes or type 2 diabetes mellitus or t2dm AND assessment tools or assessment method or assessing	Last 5 years English Language Adults: 19+ years Free Full Text	95
CINAHL #2	Summary of Diabetes Self-Care Activities AND education	English Language Research Article Peer Reviewed 2016-2021 All adult	13
PUBMED #2	Summary of Diabetes Self-Care Activities AND education	Last 5 years English Language Adults: 19+ years Free Full Text	13

Appendix D

Literature Synthesis Table

Author/ Title	Level of Evidence	Purpose of the project/research	Frame work	Results	How does this relate to your project?	Implications for Practice
Afaya et al. (2020)	Analytical Descriptive Cross-Sectional	Evaluate DM2 patients for diabetes related medication adherence, self-care behaviors, and knowledge	None	Higher age and education increased medication adherence. Increased knowledge equated to increased self-management.	Utilization of SDSCA helps providers identify areas of weakness for patients and intervene with strategies that promote adherence.	Identifying targeted educational needs can improve patient education, thereby improving self-care and outcomes
Bauer et al. (2018)	RCT	Determine impact of education text messages on diabetes self-management activities and outcomes in patients with painful diabetic peripheral neuropathy	None	Neuropathy pain was not reduced. Scores improved for all SDSCA subscales and health beliefs. HbA1c declined but not significantly.	Utilization of an educational intervention via text messaging that was relevant to SDSCA subscales improved scores.	Educational activities that correlate to SDSCA content can improve self-care behaviors and scale scores.
Formosa et al. (2016)	Non-Experimental Prospective Study	Assess for correlation between knowledge and self-care behaviors in patients with DM2	None	No correlation between overall diabetes knowledge and SDSCA. Significant correlation between knowledge and diet subscale.	There are limitations to correlating knowledge with self-care behaviors. Utilizing behavior change theories to enhance self-care may help.	Supporting behavioral change to enhance self-care through education should incorporate behavior change theories/models.
GB et al. (2016)	True Experimental Study	Evaluate the effectiveness of a behavioral intervention on self-efficacy, self-care behavior and HbA1c values among patients with type 2 diabetes mellitus.	None	The experimental group, who received both routine clinic treatment, and an educational intervention, saw enhanced confidence in self-management of the DM2, which in turn improves their self-care behavior and HbA1c values, over the control group who only received routine clinic treatment.	The SDSCA was utilized as a pre- and post-test with both the control and the experimental groups.	Providing a structured educational intervention improves self-care behavior and HbA1c values.

Jiang et al. (2019)	Cross-Sectional	Test a model of self-efficacy, diabetes distress, knowledge, and education level and diabetes self-management (DSM) behaviors.	Social Cognitive Theory	Self-efficacy had the strongest direct effect on DSM behaviors and mediated the effects of the other variables as well. Knowledge had a direct effect on DSM behaviors.	Knowledge based interventions can affect self-care but should be enhanced by theories that support self-efficacy.	Focusing on self-efficacy can enhance diabetes education efforts being done in the office.
Marques et al. (2019)	Quasi-Experimental Study	Implement group education for older adults focusing on diabetic self-care.	None	SDSCA scores demonstrated that self-care increased in the areas of diet and foot care.	The SDSCA can be effectively used to measure elements of self-care for pre- and post- education intervention.	Group educational interventions are useful for improving diabetes self-care.
Nogueira, et al. (2020)	Systematic review and meta-analysis of randomized clinical trials	Investigate the impact of pharmaceutical care and educational interventions on DM2.	None	Pharmaceutical care and educational interventions have significant positive impact on type 2 diabetes mellitus. The tools SDSCA and the Morisky Medication Adherence Scale may be useful to monitor patients.	Utilization of the SDSCA scores in RCT analyzed in this review showed improvement in key areas of diabetic education such as HbA1c and fasting blood glucose.	Educational interventions and the use of the SDSCA improve outcomes for patient with diabetes.
Zheng et al. (2019)	RCT	Develop an outpatient interactive educational program and evaluate its effects utilizing the SDSCA prior to the education program and after the educational program. An outpatient diabetes self-management education was subsequently conducted to guide these subjects in an appropriate, targeted, self-management manner and to improve the self-management level.	None	Compared with the control group, scores of the SDSCA measure and problem areas in the diabetes scale, fasting blood glucose, postprandial 2-hour blood glucose, and HbA1c were significantly improved in the intervention group after the intervention ($P < 0.01$).	SDSCA scores in the group that received the standardized educational intervention were higher than those that did not receive the standardized educational intervention.	Standardized educational interventions improve the level of self-reported self-management, psychological distress, and glycemic control in patients with type 2 diabetes mellitus.

Appendix E

DNP Project Timeline: GANTT Chart

Task	Task Description	6/21	7/21	8/21	9/21	10/21	11/21	12/21	1/22	2/22	3/22	4/22	5/22
1	Faculty advisor meetings	x	x	x									
2	Community partner meetings	x	x	x									
3	Literature Review	x	x	x									
4	Completed proposal presentation	x	x	x									
5	Committee review and approval			x									
6	Development of in clinic process implementation	x	x	x									
7	Implementation of intervention				x	x	x	x					
8	Collection of outcome data				x	x	x	x					
9	Evaluation of outcome data				x	x	x	x	x	x	x		
10	Completion of final report								x	x	x	x	x

Appendix F

IRB Approval

MICHIGAN STATE
U N I V E R S I T Y

DETERMINED NOT "RESEARCH"
Revised Common Rule

September 2, 2021

To: Adrianne Wilkerson

Re: **MSU Study ID:** STUDY00006600
Principal Investigator: Adrianne Wilkerson
Determination Date: 9/2/2021

Title: DNP Project: Assessment of Self-Care and Education in Patients with Type 2 Diabetes Mellitus

The activity described in this submission was determined not to be "research" as defined by the Common Rule as codified in the U.S. Department of Health and Human Services (DHHS) regulations for the protection of human research subjects.

Definition of Research
For DHHS, "*Research* means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research:

Office of Regulatory Affairs
Human Research Protection Program

4000 Collins Road
Suite 136
Lansing, MI 48910

517-355-2180
Fax: 517-432-4503
Email: irb@msu.edu
www.hrpp.msu.edu

(1) Scholarly and journalistic activities (e.g., oral history, journalism, biography, literary criticism, legal research, and historical scholarship), including the collection and use of information, that focus directly on the specific individuals about whom the information is collected.

(2) Public health surveillance activities, including the collection and testing of information or biospecimens, conducted, supported, requested, ordered, required, or authorized by a public health authority. Such activities are limited to those necessary to allow a public health authority to identify, monitor, assess, or investigate potential public health signals, onsets of disease outbreaks, or conditions of public health importance (including trends, signals, risk factors, patterns in diseases, or increases in injuries from using consumer products). Such activities include those associated with providing timely situational awareness and priority setting during the course of an event or crisis that threatens public health (including natural or man-made disasters).

(3) Collection and analysis of information, biospecimens, or records by or for a criminal justice agency for activities authorized by law or court order solely for criminal justice or criminal investigative purposes.

(4) Authorized operational activities (as determined by each agency) in support of intelligence, homeland security, defense, or other national security missions." [45 CFR 46.102(l)]

Determination
Add explanation
Support of self-care behaviors through a standardized educational process maximizes patient adherence to a diabetes plan of care, which subsequently improves diabetic health outcomes. Therefore, the purpose of this quality improvement project is to implement a standardized self-care assessment and educational intervention for CIMA's adult patients over 18 years of age with DM2 and HbA1c greater than 9%. This process change will also provide consistency across providers of diabetes follow-up visits, as well as in office workflow.

This is not a research study but a QI project designed to meet the needs of one specific primary care office. You are not creating new information but utilizing existing information to make a practice change for one group.

Hence, the activity does not involve research.

Therefore, the federal regulations for the protection of human subjects would not apply to this activity and Michigan State University (MSU) Institutional Review Board (IRB) approval is not needed to proceed. However, please note that while MSU IRB approval is not required, other federal, state, or local regulations or requirements or ethical or professional standards may still be applicable based on the activity.

Modifications: If any of the activities described in this submission change, please contact the IRB office as the activity may involve human subject research and require IRB approval. For example, this determination is not applicable to activities that may be regulated by U.S. Food & Drug Administration (FDA), such as those involving drugs, medical devices, human food additives, color additives, electronic products, or any other test articles regulated by the FDA.

Modifications to Funding: Changes in funding may alter this determination. For example, MSU IRB review and approval is required if MSU receives an award through a grant, contract, or cooperative agreement directly from a federal agency, even where all non-exempt research involving human subjects are carried out by employees or agents of another institution. In addition, the new funding source may have additional or different requirements.

For More Information: See HRPP Manual Section 4-3, Determination of Human Subject Research (available at hrpp.msu.edu).

Contact Information: If we can be of further assistance or if you have questions, please contact us at 517-355-2180 or via email at IRB@msu.edu. Please visit hrpp.msu.edu to access the HRPP Manual, templates, etc.

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Appendix G

CIMA Letter of Support

CAPITAL INTERNAL MEDICINE ASSOCIATES, P.C.

CIMA
cimamed.com

Date: 8/15/2021

To the Michigan State University College of Nursing:

I am familiar with the quality improvement project being conducted by Kristen Monroe and Adrianne Wilkerson entitled "Improving Self-Efficacy in Patients with Type 2 Diabetes Mellitus." I understand that the involvement of Capital Internal Medicine Associates, P.C. will include mentoring the above-named students and will require us to allow them to review our current processes and/or practices, policies and procedures, records, protocols, benchmarks, and performance data as related to the project. We will also allow their participation in improvement team meetings and staff education.

I have read the project's proposal and am comfortable with the project as described being conducted at our institution. I understand that this project will be carried out following sound, ethical principles. Capital Internal Medicine Associates, P.C. gives permission for the students to disseminate deidentified project data and outcomes at Michigan State University College of Nursing for the purpose of academic course completion. Therefore, as a representative of Capital Internal Medicine Associates, P.C., I agree that Kristen Monroe and Adrianne Wilkerson's evidence-based project may be conducted at our institution.

Sincerely,

KRichardson-Aubrey NPC

Dr. Kristal Richardson-Aubrey, DNP, RN, FNP-BC

Appendix H

Intervention and Data Collection Process
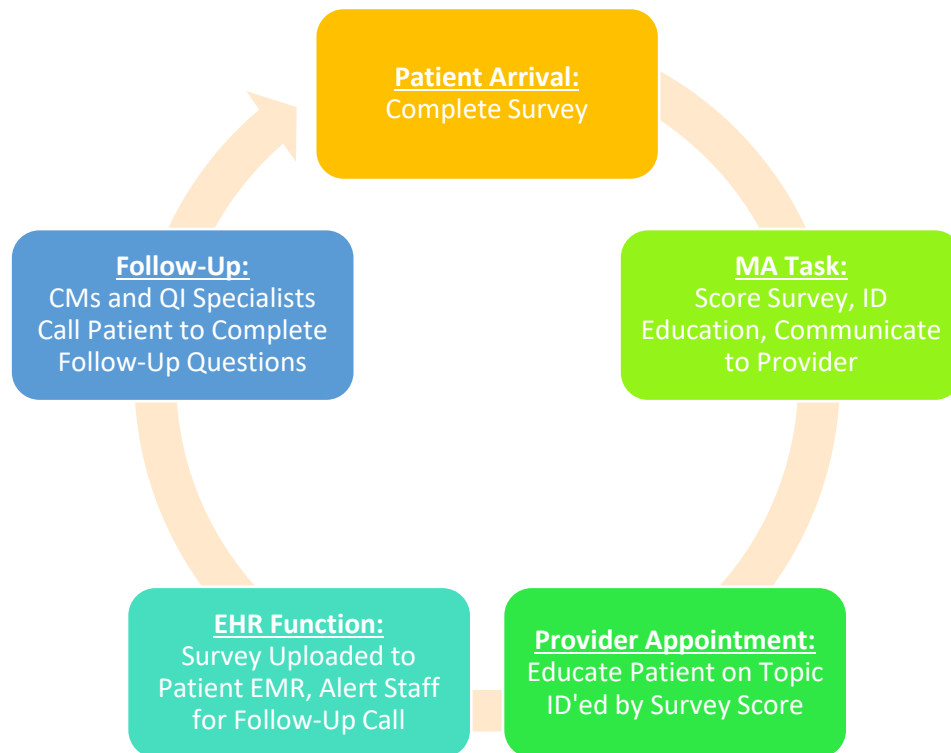
Appendix I

Abbreviated SDSCA Scale

Statement of Consent:

By completing this assessment tool, I give my consent to participate in the "Assessment of Self-Care and Education in Patients with Type 2 Diabetes Mellitus" project performed by Michigan State University Doctor of Nursing Practice students.

Summary of Diabetes Self-Care Activities Questionnaire (SDSCA)©(Toobert, et al., 2000)

> 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

Physical Activity

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

4. 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 Sugar Testing (skip this section if your provider has not instructed you to test your blood sugar)

5. On how many of the last SEVEN DAYS did you test your blood sugar?   · 0 · 1 · 2 · 3 · 4 · 5 · 6 · 7

6. 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

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

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

Medications

9.   On how many of the last SEVEN
        DAYS, did you take your
        recommended diabetes
        medication?   0   1   2   3   4   5   6   7

Smoking

10. Have you smoked a cigarette,
    even a puff, in the past SEVEN
    DAYS?   0 No   1 Yes

10a. If yes, how many
     cigarettes did you
     smoke on an average day?   Number of cigarettes: _____

Scoring Instructions for the Summary of Diabetes Self-Care Activities (SDSCA)[©]

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.

Exercise = Mean number of days for items 3 and 4.

Blood-Glucose Testing = Mean number of days for items 5 and 6.

Foot Care = Mean number of days for items 7 and 8.

Medications = Use total number of days for item 9.

Smoking Status = Item 10 (0 = nonsmoker, 1 = smoker) and item 10a number of cigarettes smoked per day.

Appendix J

Additional Questions

Initial Additional Questions:

1. Have you ever talked to your provider about any of these topics (circle all that apply): diet, exercise, blood sugar testing, foot care, medication adherence, smoking

2. Have you ever participated in a formal diabetes education program? Yes   No

3. Are you interested in participating in a formal diabetes education program? Yes   No

4. If you are interested in participating in formal diabetes education, where would you prefer to attend (circle all that apply): Sparrow, McLaren, or in the CIMA clinic

5. Have you seen an endocrinologist for your DM in the past or are you currently seeing one? Yes   No   If yes, who was/is the endocrinologist?

Post Intervention Follow-Up Questions:

1. Repeat the questions from the subscale that required education.

2. Do you feel you learned something from your appointment with your provider?   Yes   No

3. Did you find the educational handout useful? Yes   No

4. Do you feel you've made improvements in self-care in the area of education you covered? Yes   No

5. What else would help you improve your self-care or support your DM care?

Appendix K

SDSCA Tool Authorization

ePROVIDE™: Your User Agreement - Summary of Diabetes Self-Care Activities - 40359

ET   eprovide@mapi-trust.org
To ● Wilkerson, Adrianne

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Appendix L

ADA Educational Handouts

Standards of Care

https://professional.diabetes.org/sites/professional.diabetes.org/files/media/Standards_of_Care.pdf

Diet:

https://professional.diabetes.org/sites/professional.diabetes.org/files/pel/source/wcie_2019_portion_control_flyer_en_8_5x11_draft03_lowres.pdf

Physical Activity:

https://professional.diabetes.org/sites/professional.diabetes.org/files/media/15_advisor_physical-activity_eng_med-res.pdf

Blood Glucose Testing:

https://professional.diabetes.org/sites/professional.diabetes.org/files/pel/source/sci-advisor_2018_blood_glucose-newb-final_v2.pdf

https://professional.diabetes.org/sites/professional.diabetes.org/files/pel/source/sci-advisor_2018_blood_glucose_log.pdf

Foot Care:

https://professional.diabetes.org/sites/professional.diabetes.org/files/pel/source/sci-advisor_2018_taking_care_of_your_feet-newa_0.pdf

Smoking:

https://professional.diabetes.org/sites/professional.diabetes.org/files/pel/source/sci-advisor_2018_all_about_quitting_smoking_v3.pdf

Medications:

https://professional.diabetes.org/sites/professional.diabetes.org/files/pel/source/medications.pdf

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