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Staff and Provider Education on Diabetic Foot Exams and Foot Care Using the Ophelia Process

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STAFF AND PROVIDER EDUCATION ON DIABETIC FOOT EXAMS AND FOOT CARE USING THE OPHELIA PROCESS

by

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ABSTRACT

Diabetes mellitus continues to grow in global prevalence and consumes an increasing amount of healthcare resources. Persons that live in disadvantaged groups have a higher prevalence due to a lack of understanding and access to care. Diabetes is one of the leading causes of chronic disease and limb loss worldwide. Diabetes foot care is essential, as diabetes can be dangerous to patients' feet.

The purpose of this doctoral project was to increase diabetic foot care education and foot exams for staff and providers in a federally qualified health center (FQHC). Many people in this rural community do not understand the importance of diabetes and foot care. More staff training was therefore deemed necessary to support the dissemination of diabetic foot care information to eligible patients.

Following the Ophelia process as an interventional guide to increasing staff and provider education would include stakeholders like board members, executive staff, clinical staff, and diabetic patients. A pretest of diabetic foot care knowledge was given to staff, a PowerPoint® educational presentation was given to all providers and clinical staff followed by a posttest.

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DEDICATION

A special recognition to my dear Mother, Mary Ellen McCurdy; thanks for staying strong for me along with my son; Daniel Magee, who supported me and did his best to keep me on track.

To my siblings Renee, Joseph, and LaJuan; thank you for all of the love and optimal support. Many thanks to Deneshia Clayton for being a distant supporter who has followed me, encouraged me, and lifted me up throughout this part of my life.

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LIST OF ABBREVIATIONS

ACA	Affordable Care Act
AACN	American Association of Colleges of Nursing
CEO	Chief Executive Officer
CDC	Centers for Disease Control and Prevention
CHRR	County Health Rankings and Roadmaps
CMO	Chief Medical Officer
COO	Chief Operations Officer
DFU	Diabetic Foot Ulcer
DNP	Doctor of Nursing Practice
FQHC	Federally Qualified Rural Health Center
HBM	Health Belief Model
HBM	Health Belief Model
HHS	Department of Health and Human Services
HLQ	Health Literacy Questionnaire
IRB	Institutional Review Board
LCSW	Licensed Clinical Social Worker
LPN	Licensed Practical Nurse
MA	Medical Assistant
MD	Medical Doctor
NP	Nurse Practitioner
PCP	Primary Care Provider

PICO	Patient/Population, Intervention, Comparison and Outcomes
RN	Registered Nurse
T2DM	Type 2 Diabetes Mellitus
USM	The University of Southern Mississippi
WHO	World Health Organization

CHAPTER I – INTRODUCTION

Background and Significance

Despite increased spending on health care, the burden of non-communicable disease continues to grow and socioeconomic gradients in health continue to widen (Beauchamp et al., 2017). Diabetes mellitus continues to grow in global prevalence and consumes an increasing amount of healthcare resources. According to (Hingorani et al., 2016), one of the key areas of morbidity associated with diabetes is the diabetic foot. Diabetes is one of the leading causes of chronic disease and limb loss worldwide, presently affecting 382 million people. Predictions show that by 2035, the number of reported diabetes cases will soar to 592 million (Hingorani et al., 2016).

Diabetes burden is a major long-term challenge for individuals (Debussche, 2021). For persons with type 2 diabetes, health literacy is especially critical when working with disadvantaged groups that lack access to and understanding of health information and health services (Dias et al., 2021). The burden of limited health literacy at the population level is significant and continues to be unequal (Villani & Trivedi, 2020). Due to this fact, the federal government has given substantial attention to advancing our understanding of health literacy (Villani & Trivedi, 2020). Health literacy is regarded as a social determinant of health and improved health literacy is a goal of public health, being one of the key pillars of health promotion (Dias et al., 2021). The Institute of Medicine (IOM) is reported as the largest public funder of medical research, by funding support for health literacy research to improve health outcomes (Villani & Trivedi, 2020).

Equally important are global and national commitments to improving health outcomes and the well-being of all populations, ensuring that no communities are left behind, and calling for effective implementation of evidence-based interventions and comprehensive approaches (Dias et al., 2021). Studies have found considerable success in using the Ophelia process to co-design intervention ideas using the Health Literacy Questionnaire (HLQ) as an assessment tool (Cheng et al., 2020).

The Ophelia approach identifies what our best practitioners and managers do daily and builds upon this experience and knowledge then it considers the different health literacy needs of people across cultures and personal situations (*Optimizing health literacy to improve health equity,* 2013).The approach systematically gathers knowledge and best practice across organizations and co-creates interventions such that they are locally owned, appropriate for the intended settings, and implementable by tailoring health literacy responses for each identified health literacy need (*Optimizing health literacy to improve health equity,* 2013).

The Ophelia approach also includes the development and facilitation of *communities of practice*. The Ophelia process utilizes an interventional mapping and quality improvement process. A needs assessment is a requirement for the DNP project as is the same for the Ophelia Process.

One important factor was having practitioners and clinicians participating in Ophelia and developing skills and insights around understanding and addressing health literacy issues. Policymakers saw how their needs were addressed by providing evidence-based, systems-orientated, and sustainable responses to identified health literacy needs at the individual and organizational levels. Organizations will be able to identify service

gaps, especially those with low health literacy profiles (*Optimizing health literacy to improve health equity,* 2013).

The theoretical underpinnings of the Ophelia approach are described in the protocol for a large multi-centered partnership project conducted in Victoria, Australia (hereafter called Ophelia Victoria). The partnership was co-designed by academic teams from two Universities, three sections within the state government Department of Health and Human Services, and nine health service sites across Victoria (Beauchamp et al., 2017a). Ophelia Victoria is an approach to health system strengthening through a) optimizing the health literacy of individuals and, b) optimizing the health literacy responsiveness of organizations.

Problem Statement

Diabetes self-management education is a clinical practice intended to improve preventive practices and self-care (Rutledge et al., 2017). The health literacy gap is emerging between the abilities of patients and the demands placed by increasingly complex health services (Kaper et al., 2021). The health literacy gap can lead to a range of negative consequences for people with limited knowledge who find it difficult to access and navigate healthcare organizations, communicate with health professionals, understand information, and engage in decision-making and self-management (Kaper et al., 2021). Shared decision-making is a process in which healthcare professionals and patients work together to select tests, treatments, management, or support packages, based on clinical evidence and the values of patients and informed preferences (Muscat et al., 2020

Health literacy and the lack of generalized knowledge of health promotion brought about attention as early as the 1970s (Liu, 2021). Due to the constantly rising costs of health care and non-communicable diseases over the past two decades, health literacy has been suggested as one of the most promising and cost-effective approaches to overcoming non-communicable disease challenges (Liu, 2021). Surprisingly, the World Health Organization (WHO) recommends health literacy as an instrument for achieving several key targets listed in the Sustainable Development Goals (Liu, 2021). "Quality improvement and Patient-Centered Care facilitates continuous improvement and when work is focused on quality, costs decrease over time" (Deming, 1986; Zaccagnini & Pechacek, 2021, p. 59).

Population

Staff and providers of an FQHC were the populations. The participants must be 18 years and older to participate in the study. The participants must be an employee in the medical services department.

Intervention

This intervention increased staff and providers' level of knowledge of diabetic foot exams and diabetic foot care. Patient-understandable education can effectively avoid a wide range of illnesses and foot issues. Foot, toe, or leg amputations is preventable with proper diabetic education and daily foot care. Foot care tools were available for diabetic foot exams and screenings within the clinical setting.

Pre- and post-diabetic educational surveys were available for staff and providers. Once the surveys were complete, a statistical analysis of the staff surveys determined the

internal consistency. The pre-test and post-test results was a source to determine the level of knowledge staff and providers possess on diabetic foot exams and foot care.

Comparison

Implementation of the Ophelia process to gather and study data processes was the intervention source of knowledge comparison for staff and providers. The nursing staff completed questions on diabetic foot care and diabetic foot exams. Those results were reviewed to determine if diabetic foot care education was of benefit.

Outcome

Staff and providers' knowledge of diabetic foot exams and foot care increased because of staff and provider education. Staff learned the importance of performing diabetic foot care screenings and exams. As a result of this education regarding the diabetes screening intervention checklist, staff members screened more diabetic patients, and the results of the education improved.

Available Knowledge

Every three minutes and 30 seconds in the United States, limbs are amputated due to diabetes, according to the American Diabetes Association (ADA). Amputations are on the rise in the United States. Just last year, 154,000 diabetes-related amputations took place. Diabetes is the single greatest factor in amputations. An individual who has had an amputation has an increased chance of five-year survival than someone with coronary artery disease, breast cancer, and colorectal cancer.

The Department of Health and Human Services (HHS) Health Literacy Workgroup was comprised of all operating and most staff divisions under HHS (Healthy People 2030, 2021). The workgroup has built collaborations with other organizations to

improve health literacy. The goals of the workgroup included creating understandable and actionable health information, supporting and engaging health consumers, and lastly, refreshing the health literacy science base regularly (Healthy People 2030, 2021).

The Ophelia Process is a modern, whole-of-system, approach to developing grounded health literacy interventions (*Optimizing health literacy to improve health equity,* 2013). Ophelia uses a co-creation approach where a wide range of patients, practitioners, and policymakers work together to develop health literacy interventions. This pilot tests new health literacy interventions to inform subsequent, larger-scale, implementation (*Optimizing health literacy to improve health equity,* 2013).

Needs Assessment

The Mississippi diabetes action plan discusses the diabetic epidemic. Diabetes was the seventh leading cause of death in the United States. In 2017, the Centers for Disease Control and Prevention (CDC, 2021) estimated 30.3 million Americans, or 0.4% of the population, live with diabetes. Health outcomes according to County Health Rankings and Roadmaps (CHRR, 2019), Jones County ranks in the higher middle of counties in Mississippi which 50%-75% showing how healthy a county is right now. Clinical Care health factors show 17% uninsured persons in Jones County which is 2% more than Mississippi at 15%.

Supporting evidence from the National Library of Medicine and CHRR (2019), prove interventions for diabetes and health literacy in rural populations are available. Consequently, low health literacy is a federal issue and has become a population health issue. For this reason, approaches to addressing limited health literacy are being done by simplifying health education and increasing adherence to treatment (CHRR, 2019). After

reviewing the process of staff engagement and ineffective outcomes, following a guided implementation like the Ophelia process will benefit the staff and patients.

Lack of staff engagement, cultural competence, and patient knowledge deficit are all factors that contribute to this problem. As a result, these patients experience negative health outcomes, such as self-care deficit. Healthcare organizations can reduce these demands and "make it easier for people to navigate, understand, and use information and services to take care of their health" (Kaper et al., 2021, p. 2).

Health literacy is a Social Determinant of Health (Healthy People 2020) that influences improvement in health, patient empowerment, and reduction in inequalities (Fernandez-Gutiérrez et al., 2017). An assessment of the healthcare facility will be the first step to obtaining information on the underserved, uninsured, and undocumented populations. An assessment of staff knowledge and the importance of cultural competence will determine inclusion in the process of screening for health literacy.

Synthesis of Evidence

Gathering of literature to support this project in Google Scholar, Cochran Library, and County Health Rankings and Roadmaps. Diabetic foot care, Health literacy, diabetes, Ophelia and Health literacy, diabetic amputation, diabetic foot care, and barriers to diabetic foot care helped gain data for research. Diabetes is one of the leading complex chronic diseases affecting 425 million worldwide. The mainstay of diabetes treatment is diabetes-related education. Ongoing education aims to reduce the possible complications of the disease for both the individual and the healthcare system (Yuncken et al., 2020). Rural Americans with diabetic foot ulcers face a 50% increased risk of foot amputation

(Sutherland et al., 2020). Rural PCPs report a lack of training in wound care and quickly referred patients with DFUs to local podiatrists or wound care providers.

Proper diabetic foot care is a crucial aspect of diabetes treatment for limb and foot ulceration Healthy People features health literacy as part of its framework. Explicitly, accomplishing health literacy for all is one of Healthy People 2030's five overarching goals (Brach & Harris, 2021). Further, Healthy People 2030 has released an extended definition of health literacy (Brach & Harris, 2021). Healthy People previously identified health literacy exclusively in terms of persons' capacities to understand health information (Brach & Harris, 2021). Now Healthy People's definition comprises a new organizational element that recognizes the important role organizations that provide health-related information and services play in improving health literacy (Brach & Harris, 2021). Physicians, as both clinicians and organizational leaders, have key roles to play in helping their organizations become health literate (Brach & Harris, 2021).

Rationale

Specific Aim of the Project

This project will determine the lack of staff knowledge that may be a major factor in the low success of patient health outcomes in the rural health setting. Sharing information with patients and allowing them the option of making decisions regarding their health will build a basis of foundation and continued positive health outcomes. Optimizing the health literacy of individuals and optimizing the health literacy responsiveness of organizations has led to an approach to health systems strengthening (Beauchamp et al., 2017). The Ophelia Approach (OPtimizing Health LIterAcy and

Access) has been used to generate health service improvements that enhance health outcomes and address the inequity of access to healthcare.

PICO

Among staff and providers of patients 18 to 45 years with Diabetes in a Rural Health population without recent foot exams, Will the implementation of the Ophelia Process improve the knowledge of staff and Providers concerning health literacy of Diabetic patients ages 18 to 45?

Theoretical Framework

According to Mavrogenis et al. (2018), the lifetime risk for diabetic patients to develop a diabetic foot ulcer is 25%. Optimal management of patients with DFU; must include clinical awareness, adequate blood glucose control, periodic foot inspection, and custom therapeutic footwear. A diabetic foot ulcer is a localized injury to the skin. The occurrence of foot problems increases the risk of amputation. According to Mavrogenis et al. (2018), this is a summary of current knowledge for the diagnosis and management of patients with DFUs; and increasing the awareness of the treating physicians for their prevention, early diagnosis, and prompt treatment.

One of the most popular models in health promotion initiatives to use when attempting to explain why someone might or might not take preventive health measures is the health belief model (Luquis & Kensinger, 2018). The HBM claims that the categories of perceived seriousness, susceptibility, benefits, barriers, cue to action, and self-efficacy can be used to explain whether someone takes action to avoid, detect, or better unhealthy behaviors (Luquis & Kensinger, 2018).

The Patient Protection and Affordable Care Act (ACA) encourages health promotion and disease prevention by making preventive care more accessible and affordable for many Americans (Luquis & Kensinger, 2018). Chronic illness and disability are still on the rise as a result of poor lifestyle decisions. Diabetes patients must continuously manage and make self-care decisions to reduce the short- and long-term effects of the illness. The purpose of this research was to evaluate how the health belief model was used to characterize self-care behaviors among diabetes patients (Melkamu et al., 2021).

Doctor of Nursing Practice Essentials

Essential I: Scientific Underpinnings for Practice

The scientific foundations of this education consider the complexity of doctoral practice and the rich history that forms the philosophical basis of nursing (AACN, 2006). Additionally, nursing science has expanded the scientific foundations of the field and produced a sizable amount of knowledge to direct nursing practice (AACN, 2006).

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

For DNP graduates to enhance patient and health care outcomes, organizational and systems leadership are essential (AACN, 2006). The objectives of nursing and health care to end health disparities, promote patient safety, and succeed in practice are consistent with doctoral-level knowledge and skills in these fields (AACN, 2006). Practice for DNP graduates involves not only direct patient care but also attention to a panel of patients, a target population, a group of populations, or a large community (AACN, 2006). Providers must be able to assess the impact of practice policies and

procedures on meeting the health needs of the patient populations with whom they practice (AACN, 2006). DNP graduates can organize care to address emerging practice problems and the ethical dilemmas that emerge as new diagnostic and therapeutic technologies evolve (AACN, 2006).

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

To promote safe, prompt, efficient, effective, equitable, and patient-centered care, it is important to design, implement, and assess quality improvement methods. To improve health care outcomes, the DNP's job also entails disseminating research and practice findings based on the best available evidence (AACN, 2006).

Essential V: Health Care Policy for Advocacy in Healthcare

The DNP-prepared nurse is to inform others about nursing, health policy, and the results of patient treatment, including decision-makers at all levels of government (AACN, 2006). Promote the nursing field among those who work in health care and policy and promote social fairness, equity, and moral principles across the board in the health care industry (AACN, 2006). Health disparities, cultural sensitivity, ethics, the internationalization of health care issues, access to care, quality of care, health care financing, and issues of equity and social justice in the delivery of health care are just a few of the many care delivery issues that are influenced by health policy (AACN, 2006).

Essential VIII: Advanced Nursing Practice

DNP-prepared nurses are to develop, design, implement, and evaluate therapeutic interventions based on nursing science and other sciences and specify the foundational practice competencies that cut across specialties and are seen as requisite for DNP practice (AACN, 2006).

Summary

To prevent more foot and/or limb amputations, it is essential to establish diabetic foot exams and foot care education in the local rural health environment. Having diabetes and never having had a foot exam or received any instruction regarding foot care is not shocking in the environment that most people live in. Staff education on diabetic foot care and foot exams is the beginning of analyzing the need for clinic staff and patient education.

CHAPTER II – METHODOLOGY

Context

Patients diagnosed with type 2 diabetes at Family Health Center, Inc. who are between the ages of 18 and 45 comprise the population of concern. Employees and health care professionals that had given their consent to participate in the study screened the patients. This rural health facility staffs seven family medicine providers. The number of patients seen by four providers in one week was 147 in total 54 patients had a diagnosis of T2DM.

The participant population will consist of medical assistants, LPNs, RNs, NPs, and MDs, in the FQHC facility. The number of potential participants is 30 staff and providers. The criteria for selection were staff that was over the age of 18, able to read and write English, with direct patient care contact responsibilities related to the diabetic foot exam.

Instrument

A pre-test survey of staff knowledge was conducted. A review of the test results proved the lack of knowledge among staff and providers. Understanding the minimal requirements of diabetic foot care could make a difference in future outcomes. Results also showed that only one staff understood the importance of diabetic patients wearing shoes and not socks or slippers to prevent possible accidental injury to toes or feet.

The post-test survey of staff knowledge showed improved self-care knowledge for diabetic patients. Staff understood that diabetic patients should be fitted for appropriate orthotics. Staff exhibited confidence in teaching diabetic foot care and foot exams to patients.

Before the implementation of this intervention, all clinic nurses were required to attend a discussion on the purpose of the study as it relates to the education currently provided during routine clinic visits. Responses from staff suggested that no staff education was done in the past. Additionally, the nurses were given instructions on what to anticipate from the study. Each nurse was asked to provide recommendations for the development of methods of delivery of basic foot care education.

During the clinic visit, diabetes patients were confidentially approached to participate in a diabetic foot care screening. Clinic appointments were not staggered or altered as the original appointment schedule was convenient for the clinic staff and the patients.

Reviewing schedules and confirming the patient's diagnosis required about two days. Once the patient was checked-in, the medical assistant placed the diabetic foot assessment form on the patient encounter. After the patient was placed in the exam room, the nurse informed the patient of a new diabetic foot screening that was available to make sure diabetic patients understood the importance of foot care and exams. on.

The instruments that were chosen for this DNP project were acceptable for staff and provider education. The importance of diabetic pre and post-test had not been evaluated by any staff or providers before this survey. The results of the post-test supported that diabetic education was also effective.

A diabetic foot assessment questionnaire was created by the Western Cape Government. This questionnaire includes two categories. Bone and joint abnormalities should be checked for hammer toes, hallux valgus, and bony prominences. The skin of

the diabetic patient should be checked for corns, calluses, cracks, and interdigital maceration. Lastly, the person should be checked for appropriate footwear.

The second group examines sensation as well as any ulcers, vascular problems, pulses in the pedals, and rest pain. Usually, if a person has had at least one amputation; another is sure to follow. If any person answers yes to just one question, the foot is at risk for ulceration or amputation. The foot then must be assessed at every visit (the Pre-Test and Post-Test can be found in Appendix A).

Interventions

The doctoral project included the use of the Ophelia Process. This strategy was presented to the CEO, CMO, COO, and board of directors for an adequate understanding of practicing locally, in accordance with the current settings, and highlighting the need for health literacy interventions related to diabetic foot exams and foot care. A letter of approval was received from the Family Health Center, Inc, Chief Medical Officer. Once the letter of consent to conduct the research by using the Ophelia Process was obtained, submission to The University of Southern Mississippi Institutional Review Board (IRB Protocol #22-1513).

The Ophelia Process

The Ophelia approach was used as a guide to identify local strengths and needs within the facility. Several phases of this process were utilized for this research. Phase 1 included identifying local strengths, needs, and issues. The stakeholders reviewed the information once the data was submitted. Effective local approaches and creative fixes were found. Phase 2 included intervention designs to improve information and service access. Local stakeholders decided upon priorities for action. Planning and designing

interventions with the ability to address regional health literacy needs or enhance information and service accessibility. Phase 3 was the implementation and evaluation of an ongoing improvement strategy. Health literacy interventions were used as part of quality improvement cycles where companies conduct studies and work to increase the intervention's efficacy and sustainability (Beauchamp et al., 2017). Participants were employees in the primary healthcare setting. A Pre-test, an educational power-point presentation, and A post-test were given on diabetic foot care. The leader of this project proceeded to create an official email invitation to staff explaining the nature of this project. The email was sent to 12 healthcare workers, including 8 nurses and 8 medical assistants.

Education of Staff

The research investigator administered a pre-test on diabetic foot care to staff. This pre-test was to gather a baseline on the knowledge of staff and providers and to compare the post-test answers after staff education. The PowerPoint® presentation was given during the monthly provider meeting, with a paper version available to the staff. The post-test was given to staff along with a diabetic foot care checklist and a diabetic foot assessment questionnaire to use.

Collection of Data

A pre- and post-survey were conducted among staff and providers. The survey was given to assess the knowledge of providers and staff on diabetic foot care and diabetic foot exams. Pre- and post-survey data was compiled to share with participating staff. With the Paired Samples t Test, the researcher can compare the means of two measurements made on the same subject, item, or related units. Post-test survey data was

also gathered to determine whether the staff and provider education was of benefit. The choice to describe all the data was to use descriptive data analysis to summarize the information provided. Descriptive statistics are used to submit pre and post-test results and data. Using descriptive statistics, the mean findings were used to determine central tendency.

Ethical Considerations

According to the Institutional Review Board, these variables were taken into consideration to uphold appropriate ethical standards (IRB). After the IRB was approved, (IRB Protocol #22-1513). All participants received information on the research and were given informed consent to assist in diabetic foot education and foot care. Participants were kept confidential and anonymous. No identities were mentioned during staff education, the post-test, or the pre-test. Participants were told to create a number that they could use as an identifier.

Summary

The Ophelia approach was used as a guide to identify local strengths and needs. A pre- and post-test were given to determine the educational needs of staff. Additionally, all potential ethical restrictions to privacy-related issues were covered in this part as the project progressed.

The context of Chapter II included the education of staff, the intervention of the Ophelia Process, and educational guidelines for effective diabetic foot exams and foot care. As we continue to discuss the importance of staff education and diabetic foot prevention, an important fact remains that was included in the pre and post-test.

Noticeably, the lack of rural health literacy and the implementation of foot exams in the primary care setting will increase health outcomes for diabetic patients.

CHAPTER III – RESULTS

A descriptive analysis was performed on all relevant findings. In Laurel, Mississippi, a rural health clinic with federal approval oversaw the doctoral project's study. A seven-question pre-test was administered to staff and providers testing the knowledge of diabetic foot care and foot exams. The survey consisted of two medical doctors, one NP, and seven clinical nurses and participated in the survey.

The following graph exhibits the actual number of patients that were seen in the clinic. 147 patients were checked –in to be seen. Of those 147 patients, fifty-four of the patients were diabetic. Thirty-four patients out of 54 patients had no diabetic education. Twenty patients said they had diabetic education in the past. Of the 147 patients; 56 were male and 91 were female, and no one claimed any other type of gender. The staff was able to share the insurance status of the patients. 36% of the patients were insured and 14% were uninsured.

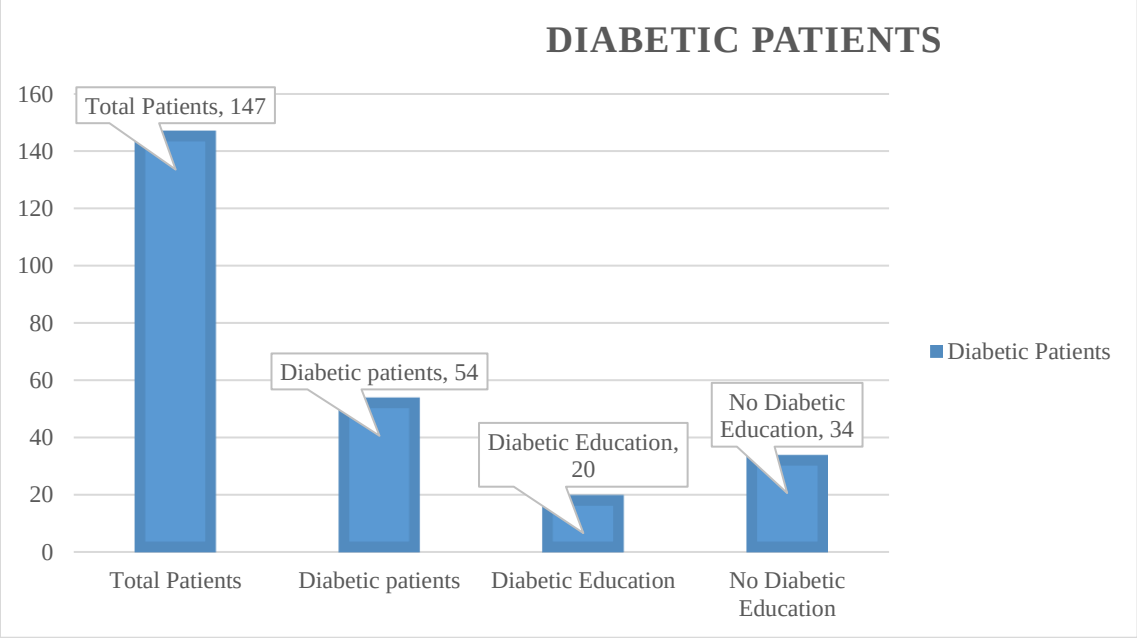


Figure 1. Total Patients Including Diabetic Patients.

Demographics included if the patient was male, female, insured, or uninsured. 34% of the sample population was female, 19% of the population was male, 36% of the population was insured and 14% of the population was uninsured. Medicare carried a majority of the insurance due to the age of the patients.

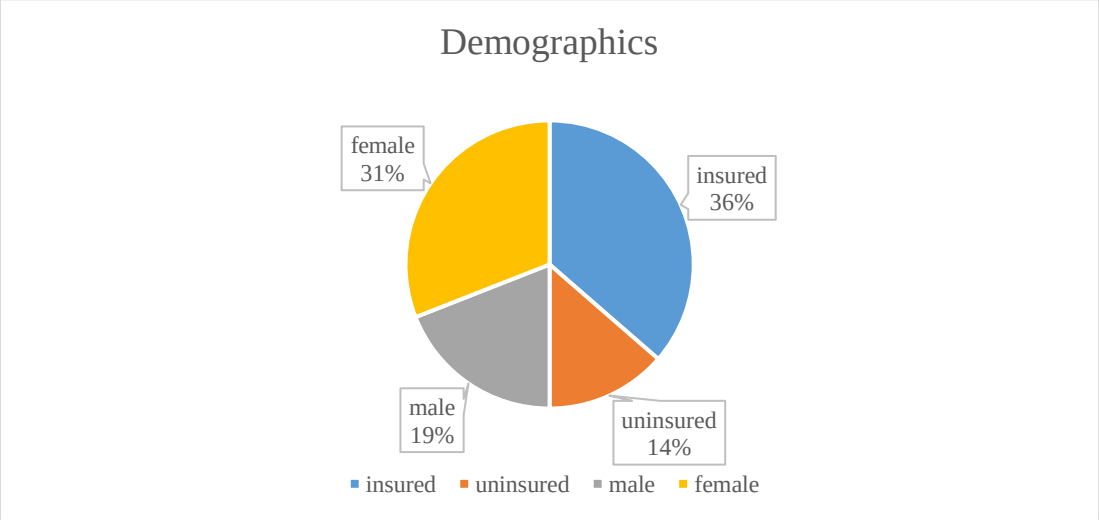


Figure 2. Patient Demographics.

Pre- and Post-Survey Diabetic Foot Care

Ten staff completed the pre and post-test. Based on the results, staff and provider knowledge increased after intervention and education. The pretest scores ranged from 14 to 71, with an average of 43. The posttest scores were from 85-100 with an average of 97. The standard deviation was 20.1 on the pre-test and 6.23 on the post-test.

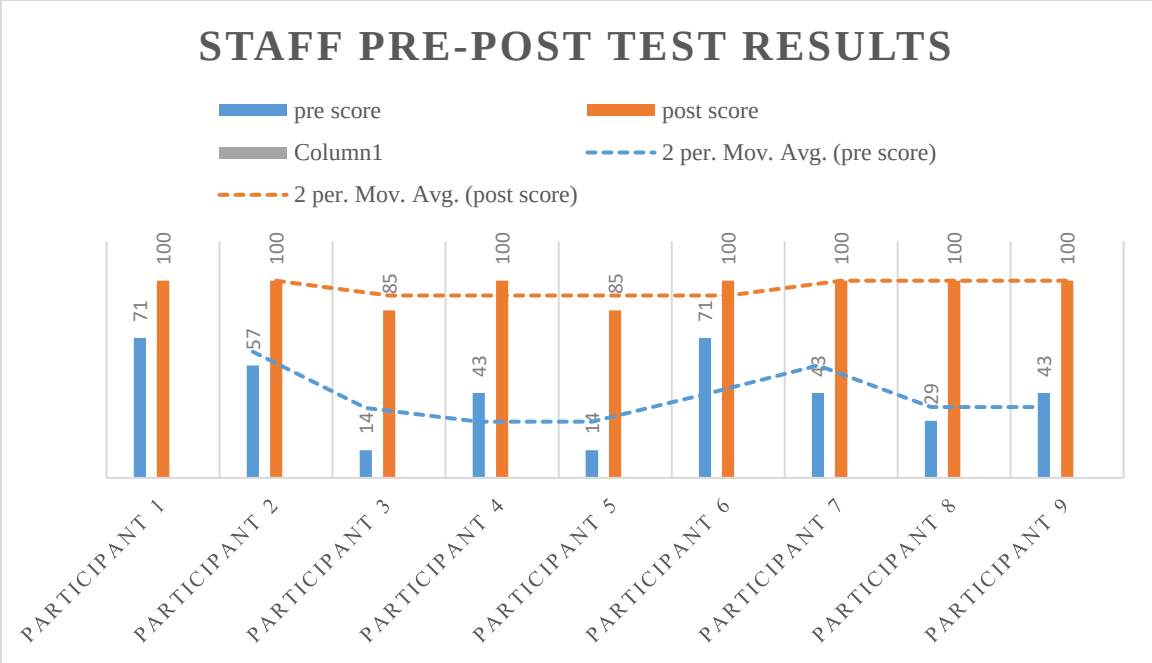


Figure 3. Staff Pre-Post Test Results.

Summary

The total number of diabetic patients seen were 54. Staff was able to screen 34 diabetic patients and educate on the importance of diabetic foot care and exams. Chapter III revealed a statistically significant increase in staff and provider diabetic foot care and foot exams. Demographic data only included insurance status and sexual orientation. Staff engagement increased and staff knowledge of diabetic foot care and exams increased.

CHAPTER IV – DISCUSSION

Staff and providers' knowledge of diabetic foot exams and foot care increased because of staff and provider education. A policy for diabetic foot care education is not yet in effect at the facility. The only time, according to nursing staff, that a diabetic patient was screened is due to a complaint of foot problems from the patient.

Interpretation

The staff and providers' knowledge increased of the importance of diabetic foot examinations based on pre and post-test scores. The diabetic foot checklist and the diabetic foot assessment questionnaire prove to be of benefit to this rural health clinic. After performing diabetic foot screenings and finding problems with diabetic feet, the Providers and staff stated the importance of diabetic foot exams as well. Implementation of the diabetic foot assessment questionnaire will help to overcome some patient barriers to getting proper foot care and exams. Patient education and interaction with patients improved.

The Ophelia process is outcomes-oriented and based on refining interventions. The goal of Ophelia is to provide proof-of-concept for the viability of tailored responses to local health literacy requirements that can enhance service accessibility, health behavior, and health outcomes (Debussche, 2021). Health literacy has been identified as a major barrier to self-care in people with diabetes. Health literacy is crucial to the self-management demands of diabetes (Chen et al., 2019). Health literacy influences the abilities of individuals to engage and interact with healthcare providers and their level of knowledge about health conditions (Chen et al., 2019).

Implications for Practice

This study demonstrates how educational interventions can improve staff and providers' expertise in primary care. Participants in the weekly provider meeting were involved. Providers were made aware of the importance of diabetic foot exams and treatment through a PowerPoint® presentation. Future practice implications would make use of the Ophelia method as an ongoing approach for quality development for chronic illness, immunizations, increasing patient compliance, dental screenings, and improving health and equity outcomes. Monthly staff in-service would be very helpful in improving patient outcomes for diabetic foot treatment.

Limitations

Limitations to the study were time constraints, lack of interest in evidence-based research in the rural health setting, and continuous staff support. Due to no monthly professional development, the staff is not kept up to date on the latest education or changes in care. The facility meets monthly to discuss quality improvements; however, staff have not been educated on the possible complications of diabetic patients.

Conclusion

The DNP student intends to continue this project for future study because the staff was not completely engaged. Diabetic foot care and diabetic foot exams should be a part of every diabetic patient’s visit. With regular foot exams, the increase in diabetic foot problems will decrease. A tool that can be implemented in the electronic health record would also save time and can be used as a tracking tool to extract data on diabetic foot care.

Summary

To prevent complications from the disease, health professionals should encourage people to integrate diabetes self-care techniques into their education (Yuncken et al., 2020). Diabetes is a struggle of its own, and uncontrolled diabetes is associated with many serious complications. Diabetes is the most common reason for non-traumatic amputation in the United States, resulting in nearly 100,000 amputations every year. One in six patients with a DFU requires an amputation (Boulton et al., 2018). As current stakeholders show an interest in improving diabetic foot care and education, more emphasis must be given to performing diabetic foot care and exams.

APPENDIX A – Pre-Test and Post-Test Survey

Pre-Test and Post-Test Survey

1. True or False – A preventative self-care behavior for the diabetic patient would be walking in socks and slippers only if it is for a short period of time.

2. True or False – Diabetic orthotics are prescribed for the specific individual, If a shoe is labeled a "Diabetic Shoe" it will be safe and appropriate for a diabetic person to wear.

3. Diabetic patients should be taught that self-inspection of the diabetic feet should be performed

a. Once a day
b. 3-4 times a week
c. At regular intervals throughout the day; and anytime you remove your shoes.

4. True or False – To avoid injury to the diabetic toe, sharp scissors are recommended for trimming toenails.

5. True or False – During shoe fitting, foot care specialists should always check diabetic footwear before the patient wears it for the first time to make sure it fits properly.

6. As a nurse caring for a diabetic patient, which answer is appropriate to warm their feet if they are cold?

a. Heating pad
b. Hot water bottle
c. Electric blanket
d. None of the above

7. True or False – Corn and callus removers are safe to use on the diabetic foot without provider approval

Answers: Foot Care Quiz Answers

1. False 4. False 7. False
2. False 5. True
3. C 6. D

APPENDIX B – Foot Care Checklist

Foot Care Checklist

See how well you take care of your feet. Check the box that describes your habits. The more "yes" boxes you check, the safer your feet will be.

Foot Care Habits	Yes	No
I check my feet each day for cuts, cracks, splinters, blisters, calluses and redness.		
I call my doctor if a foot problem does not heal in one week or if redness spreads.		
I take off my shoes and socks each time I have a checkup so my feet can be examined.		
I wash my feet each day in warm (NOT HOT) water with mild soap. I dry them well.		
My toenails are trimmed straight across and the edges are smoothed with an emery board.		
I rub lotion or oil on the tops and bottoms of my feet but not between the toes.		
I wear soft, dry socks and shoes or sandals with good support that fit well.		
I check the inside of my shoes for unwanted objects before I put them on.		
I prop up my feet while sitting and move my toes and ankles every few minutes. I cross my legs at my ankles, not at my knees.		
I keep my blood sugar under control with proper eating, activity, and medicine if needed.		
I shop for shoes in the afternoon or evening.		
I never go barefoot even at home.		

For more information visit: "Take Care of Your Feet for a Lifetime"
http://www.ndep.nih.gov/campaigns/Feet/Feet_overview.htm

Handout

Self Testing Instructions

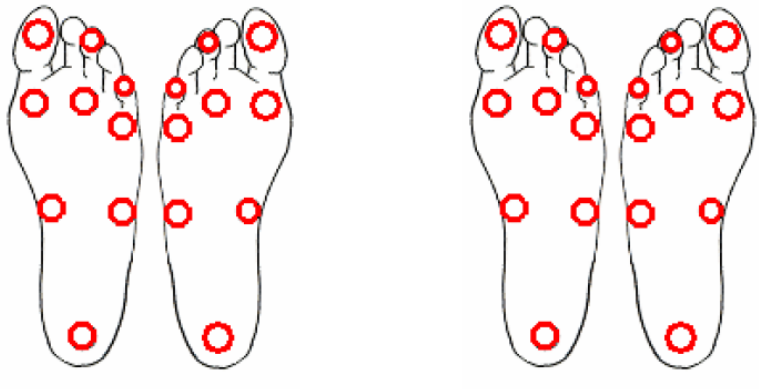
(You may screen your own feet or ask a relative, friend, or neighbor to do it for you)

Step 1 **Step 2**

1. Hold the red filament by the paper handle, as shown in Step1.
2. Use a smooth motion to touch the filament to the skin on your foot. Touch the filament along the side of and NOT directly on an ulcer, callous, or scar. Touch the filament to your skin for 1-2 seconds. Push hard enough to make the filament bend as shown in step 2.
3. Touch the filament to both of your feet in the sites circled on the drawing below.
4. Place a (+) in the circle if you can feel the filament at that site and a (-) if you cannot feel the filament at that site.
5. The filament is reusable. After use, wipe with an alcohol swab.

Diabetic Foot Screen Test Sites

If you have a (-) in any circle, take this form to your health care provider as soon as possible.



Date _____ **Date _____**

Place Filament Here

APPENDIX D – Diabetic Foot Assessment Questionnaire

Western Cape Government
Health

Diabetic Foot Assessment Questionnaire

Name: ----------
Folder No: ----------
Date: ----------

CATEGORY A

Bone or Join Abnormality

Deformity (claw toes, hammer toes, hallux valgus)	yes	no
Bony prominences, areas of abnormal pressure	yes	no
Loss of joint mobility (hallux, rigidus)	yes	no

Skin

Callus, corns, cracks, Interdigital maceration	yes	no
Inappropriate footwear	yes	no

CATEGORY B

Protective Sensation

Monofilament sensation abnormal at any spot on 2 attempts	yes	no

Ulcer

Past history of ulcer	yes	no
Past history of Amputation	yes	no

Vascular

Claudication or rest pain	yes	no
Absent pedal pulses	yes	no

If any one answer is **YES** the foot is at risk for **ULCERATION or AMPULATION**. The foot must then be **ASSESSED at EVERY VISIT**

INTERVENE and REFER Appropriately

INTERVENE

- Patient foot education
- Quit smoking
- Optimise glycaemic control
- Optimise BP control
- Optimise lipid profile

REFER

- Category A Refer to centre with access to prodiatrist
- Category B Refer to speciallist care

APPENDIX E – Recruitment Email

DNP Project Recruitment Email

Dear ____ employee,

My name is, Shasta Pickens, BSN, RN; and I am a doctoral student in the School of Leadership and Advanced Nursing Practice at The University of Southern Mississippi. I am conducting a research study as part of my DNP degree in Educating Staff and Providers on Diabetic Foot Exams and Foot care. I want to invite you to participate in my research. Your participation would be greatly appreciated.

This Evidence-based quality improvement project is aimed at increasing the level of knowledge Providers and staff possess an understanding of the importance of performing diabetic foot exams and assessing diabetic patients' knowledge of performing diabetic foot exams and care.

Many diseases and foot problems can be prevented through education on a level that the patient understands. The burden of non-communicable diseases continues to grow and socioeconomic gradients in health continue to widen.

If you decide to participate in this research, you will be asked to complete a survey before and after the presentation. These surveys should take less than 10 minutes to complete. Participation in this survey is voluntary. If you feel uncomfortable with any other information provided, you can stop at any time.

However, your participation in this study will remain anonymous. Names, email addresses, or other personal information will not be collected.

This study has been approved by The University of Southern Mississippi's Institutional Review Board. Protocol number 22-1513.

Thank you for taking the time to read this email. Again, your participation is greatly appreciated.

Sincerely,

Shasta Pickens, BSN, RN
University of Southern Mississippi Doctoral Student
shasta.pickens@usm.edu
(601)[redacted]

ORI | Office of Research Integrity

INSTITUTIONAL REVIEW BOARD
STANDARD (SIGNED) INFORMED CONSENT

STANDARD (SIGNED) INFORMED CONSENT PROCEDURES
• ***Use of this template is optional.*** However, by federal regulations (45 **CFR** 46.116), all consent documentation must address each of the required elements listed below (purpose, procedures, duration, benefits, risks, alternative procedures, confidentiality, whom to contact in case of injury, and a statement that participation is voluntary). • Signed copies of the consent form should be provided to all participants. Last Edited May 18th, 2022

Today's date:11/09/2022		
PROJECT INFORMATION		
Project Title: Implementation of Ophelia Process in the rural setting by educating Providers and staff on the importance of diabetic foot exams		
Protocol Number: 22-1513		
Principal Investigator: Shasta Pickens	Phone: 601-670-0389	Email: shasta.pickens@usm.edu
College: Nursing and Health Professionals	School and Program: School of Leadership and Advanced Nursing Practice, BSN to DNP-FNP Program	
RESEARCH DESCRIPTION		
1. **Purpose**: The purpose of the DNP project is decrease mortality, injuries, and amputations in diabetic patients by adopting strategies and implementing staff and provider education on diabetic foot exams. 2. **Description of Study:** This study will begin with a staff and provider survey on diabetic foot exams then education on participants of the clinic. This study		

will be 2-4 weeks. The participant time out will be atleast an hour. The minimal number of participants will be 50. No restrictions on normal activities or invasive procedures will be done in this study

3. **Benefits:**
   [The benefits begin with staff being required to screen and educate all diabetic patients in the prevention of diabtic foot storm. By following the Ophelia Process approach to co-design an intervention that can be implemented into clinic policy. Also to possible create an EHR template to document findings of a Diabetic foot exam.

4. **Risks:**
   [Potential risks include delay of check-out time. May be time consuming for both the patient and staff. Creating a warm hand-off from the receptionist to the clinical staff can help prevent a lengthy clinic visit.

5. **Confidentiality:**
   [The E H R is password sensitive. All staff is required to lock the comuters whenever away from the desk. Clinic security surveillance is also monitoring the office of the clinical staff. All patient information is also barcoded for each individual patient. Administration has also made it official that all participant data will stay locked in health information office.

6. **Alternative Procedures:**
   None

7. **Participant's Assurance:**
   This project and this consent form have been reviewed by USM's Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5125, Hattiesburg, MS 39406-0001, 601-266-5997.

   Any questions about this research project should be directed to the Principal Investigator using the contact information provided above.

CONSENT TO PARTICIPATE IN RESEARCH

Participant's Name: _____

I hereby consent to participate in this research project. All research procedures and their purpose were explained to me, and I had the opportunity to ask questions about both the procedures and their purpose. I received information about all expected benefits, risks, inconveniences, or discomforts, and I had the opportunity to ask questions about them. I understand my participation in the project is completely voluntary and that I may withdraw from the project at any time without penalty, prejudice, or loss of benefits. I understand the extent to which my personal information will be kept confidential. As the research proceeds, I understand that any new information that emerges and that might be relevant to my willingness to continue my participation will be provided to me.

(Include the following information only if applicable. Otherwise delete this entire paragraph before submitting for IRB approval:) The University of Southern Mississippi has no mechanism to provide compensation for participants who may incur injuries as a result of participation in research projects. However, efforts will be made to make available the facilities and professional skills at the University. Participants may incur charges as a result of treatment related to research injuries. Information regarding treatment or the absence of treatment has been given above.

_____

_____

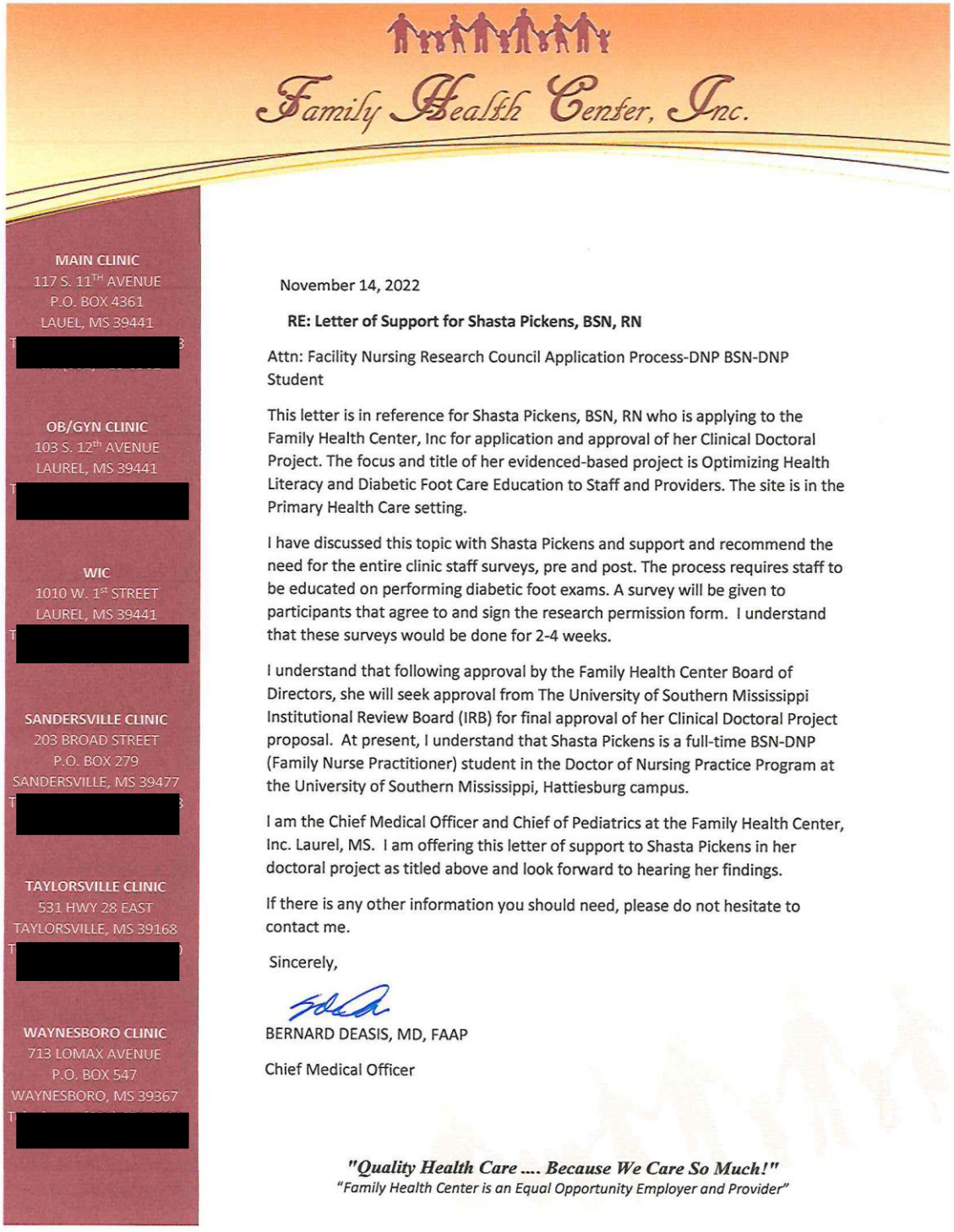
Research Participant
Person Explaining the Study

_____

_____

Date
Date

APPENDIX G – Letter of Support



Family Health Center, Inc.

MAIN CLINIC
117 S. 11TH AVENUE
P.O. BOX 4361
LAUEL, MS 39441
T [redacted]

OB/GYN CLINIC
103 S. 12th AVENUE
LAUREL, MS 39441
T [redacted]

WIC
1010 W. 1st STREET
LAUREL, MS 39441
T [redacted]

SANDERSVILLE CLINIC
203 BROAD STREET
P.O. BOX 279
SANDERSVILLE, MS 39477
T [redacted]

TAYLORSVILLE CLINIC
531 HWY 28 EAST
TAYLORSVILLE, MS 39168
T [redacted]

WAYNESBORO CLINIC
713 LOMAX AVENUE
P.O. BOX 547
WAYNESBORO, MS 39367
T [redacted]

November 14, 2022

RE: Letter of Support for Shasta Pickens, BSN, RN

Attn: Facility Nursing Research Council Application Process-DNP BSN-DNP Student

This letter is in reference for Shasta Pickens, BSN, RN who is applying to the Family Health Center, Inc for application and approval of her Clinical Doctoral Project. The focus and title of her evidenced-based project is Optimizing Health Literacy and Diabetic Foot Care Education to Staff and Providers. The site is in the Primary Health Care setting.

I have discussed this topic with Shasta Pickens and support and recommend the need for the entire clinic staff surveys, pre and post. The process requires staff to be educated on performing diabetic foot exams. A survey will be given to participants that agree to and sign the research permission form. I understand that these surveys would be done for 2-4 weeks.

I understand that following approval by the Family Health Center Board of Directors, she will seek approval from The University of Southern Mississippi Institutional Review Board (IRB) for final approval of her Clinical Doctoral Project proposal. At present, I understand that Shasta Pickens is a full-time BSN-DNP (Family Nurse Practitioner) student in the Doctor of Nursing Practice Program at the University of Southern Mississippi, Hattiesburg campus.

I am the Chief Medical Officer and Chief of Pediatrics at the Family Health Center, Inc. Laurel, MS. I am offering this letter of support to Shasta Pickens in her doctoral project as titled above and look forward to hearing her findings.

If there is any other information you should need, please do not hesitate to contact me.

Sincerely,

BERNARD DEASIS, MD, FAAP

Chief Medical Officer

"Quality Health Care .... Because We Care So Much!"
"Family Health Center is an Equal Opportunity Employer and Provider"

APPENDIX H – IRB Approval Letter

Office *of*
Research Integrity

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

118 COLLEGE DRIVE #5116 • HATTIESBURG, MS | 601.266.6756 | WWW.USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER:	22-1513
PROJECT TITLE:	Staff and Provider Education of Diabetic Foot Exams and Foot Care using the Ophelia Process
SCHOOL/PROGRAM	Leadership & Advanced Nursing
RESEARCHERS:	PI: Shasta Pickens Investigators: Pickens, Shasta~Baskin, LaWanda~
IRB COMMITTEE ACTION:	Approved
CATEGORY:	Expedited Category
PERIOD OF APPROVAL:	25-Jan-2023 to 24-Jan-2024

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

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