Implementing a Diabetic Foot Care Program in a Virtual Primary Care Clinic

Zahra Naderi Asiabar

Follow this and additional works at: https://repository.usfca.edu/dnp

Part of the Nursing Commons

Recommended Citation
Naderi Asiabar, Zahra, "Implementing a Diabetic Foot Care Program in a Virtual Primary Care Clinic" (2022). Doctor of Nursing Practice (DNP) Projects. 288. https://repository.usfca.edu/dnp/288

This Project is brought to you for free and open access by the Theses, Dissertations, Capstones and Projects at USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. It has been accepted for inclusion in Doctor of Nursing Practice (DNP) Projects by an authorized administrator of USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. For more information, please contact repository@usfca.edu.
Implementing a Diabetic Foot Care Program in a Virtual Primary Care Clinic

Zahra Naderi Asiabar, MSN
School of Nursing and Health Professions
University of San Francisco

Committee Chair: Dr. Jo Ann Loomis
Committee member: Dr. Elena A. Capella

December 2021
## TABLE OF CONTENTS

### Section I: Title and Abstract

<table>
<thead>
<tr>
<th>Title</th>
<th>01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>05</td>
</tr>
</tbody>
</table>

### Section II: Introduction

| Background | 07 |
| Problem Description | 09 |
| Local Problem | 10 |
| Setting | 10 |
| Specific Aim | 10 |
| Available Knowledge | 11 |
| PICOT Question | 11 |
| Search Methodology | 11 |
| Integrated Review of the Literature | 11 |
| Summary/Synthesis of the Evidence | 14 |
| Rationale | 14 |
| Utilization of the model | 16 |

### Section III: Methods

<p>| Context | 16 |
| Description of Intervention | 17 |
| Gap Analysis | 18 |
| Gantt Chart | 19 |</p>
<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix C</td>
<td>Evidence Evaluation Table</td>
<td>44</td>
</tr>
<tr>
<td>Appendix D</td>
<td>Gap Analysis</td>
<td>56</td>
</tr>
<tr>
<td>Appendix E</td>
<td>Gantt Chart</td>
<td>57</td>
</tr>
<tr>
<td>Appendix F</td>
<td>Work Breakdown Structure</td>
<td>58</td>
</tr>
<tr>
<td>Appendix G</td>
<td>Responsibility/Communication Matrix</td>
<td>59</td>
</tr>
<tr>
<td>Appendix H</td>
<td>SWOT Analysis</td>
<td>60</td>
</tr>
<tr>
<td>Appendix I</td>
<td>Proposed Budget</td>
<td>61</td>
</tr>
<tr>
<td>Appendix J</td>
<td>Kurt Lewin’s Change Theory</td>
<td>62</td>
</tr>
<tr>
<td>Appendix J</td>
<td>Kotter’s Change Management Model</td>
<td>55</td>
</tr>
<tr>
<td>Appendix K</td>
<td>Proposed CQI Method and Data Collection Tools</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Pre-Workshop Survey Form</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Post-Workshop Survey Form</td>
<td>64</td>
</tr>
<tr>
<td>Appendix L</td>
<td>Diabetes Foot Screen Form</td>
<td>65</td>
</tr>
<tr>
<td>Appendix M</td>
<td>Foot screening questions</td>
<td>66</td>
</tr>
<tr>
<td>Appendix N</td>
<td>Foot care brochure in English and Spanish</td>
<td>67</td>
</tr>
<tr>
<td>Appendix O</td>
<td>PowerPoint slides for education providers (Initial)</td>
<td>70</td>
</tr>
<tr>
<td>Appendix P</td>
<td>PowerPoint slides for education providers (Modified)</td>
<td>73</td>
</tr>
</tbody>
</table>
Implementing a Diabetic Foot Care Program in a Virtual Primary Care Clinic

Abstract

Background

Healthcare professionals (HCPs) have a key responsibility in delivering preventative and early intervention diabetes foot management within primary care. Diabetic foot ulcers (DFUs) are a major complication of diabetes and can lead to amputations and other wound issues.

Comprehensive care and treatment of diabetes are most effective when patients can access a supportive connection with providers. Before the pandemic, there were many reasons to utilize technology-based distance approach to health care. The coronavirus pandemic in 2019 prompted additional reasons for the transition to distant care.

Problem

The yearly screening of a virtual foot exam on patients with diabetes in the intervention clinic setting had been held since the beginning of the COVID-19 pandemic.

Methods

A pre- and post-assessment surveys and educational module were created and distributed to 11 HCPs of the clinic. Surveys were completed by four HCPs.

Interventions

The HCPs were instructed through an asynchronous educational module. A foot care educational handout was selected and submitted to the clinic to send to the patients. A reminder flag at the electronic chart of diabetic patients were designed to prompt the practitioners when foot screenings were due.
Results
The confidence level of the HCPs to perform virtual screening of DFUs increased from 75% to 93.75%. The rate of practitioners’ willingness to perform online screening of DFUs was the same at pre- and post-instructional survey (93.75%). The rates of passing on the foot care educational pamphlet to diabetic patients and document diabetic foot screening in the EHR were raised from 62.50% to 93.75%.

Conclusions
Continuing diabetic foot care program in an online primary care clinic is possible and can improve the quality of diabetic foot care.

Key words: Diabetic foot ulcer, education, telehealth, assessment, screening, health care provider
Background

Diabetes is increasing globally; about 422 million people worldwide have diabetes (WHO, 2021). It is predicted that by 2045, the universal prevalence of diabetes will grow to roughly 629 million people (International Diabetes Federation, 2017). In the USA, diabetes is the primary cause of non-traumatic amputations (Oliver & Mutluoglu, 2020). Diabetic foot ulcers as a complication continue to be a significant and widespread healthcare concern. The annual rate of foot ulcers is about 3% with the lifetime chance of developing a foot ulcer as high as 25% (Morris, 2019).

Although there have been enhancements in the management of DFUs in recent years, the DFUs continue to be connected with a high risk of amputation and mortality (Armstrong et al., 2007; Morbach et al., 2012) and late referral is a continuing topic that contributes to unfavorable outcomes including ischemia, infection, greater wound depth and size. The rising number of diabetic patients will directly and adversely impact health status and health care costs (Schramm, 2016). Therefore, prevention and care of diabetic foot wounds reduce the burden diabetes causes (IWGDF, 2019).

Preventing DFUs and other complications of diabetes requires effective management by practitioners and patients. Health care providers should provide the first intervention and initiate an early referral to specialist care according to the complexity of individual cases (Meloni et al., 2019). Primary healthcare providers play a critical role in foot screening and risk stratification assessments, foot care instruction to patients with diabetes and heightening care (The Royal Australian College of General Practitioners 2016). Patients with diabetes who did not have a foot screen were shown to have a 6.3-fold increased chance of lower extremities amputation compared with patients who went through foot screening over a two-year span (Ang
et al., 2017). In addition, postponement in referrals from primary care to specialist foot care teams is an obstacle to foot management for patients with diabetes (Mullan et al., 2019). The major diabetes-related lower limb amputation to be inversely associated with foot management service provision, including delays in referrals to multidisciplinary foot settings and podiatry (Paisey et al., 2018).

All healthcare professionals should perform a simple screening test of the neurological, vascular, dermatological, and musculoskeletal systems on patients with diabetes. For all diabetic patients, the performance of a yearly complete foot assessment to detect risk factors predictive of wounds and complications is recommended (American Diabetes Association, 2004). The key to preventing foot ulcers is education. Health care professionals, including nurse practitioners, should educate the patients about appropriate shoe wear and self-foot care. Diabetic nurse educator and providers must work together to inform the patient and family on preventative steps to reduce morbidity and enhance outcomes. The morbidity of a diabetic foot can only be minimized by an interprofessional strategy and collaboration (Oliver & Mutluoglu, 2020).

Health care clinicians face many challenges in providing best practice foot management. Diabetic foot- care requires a multi-disciplinary approach, frequent contact between patient and HCPs, regular clinical examination, and monitoring (Singh et al., 2016). In recent years, telehealth as a new technique of remote patient consultation is broadly utilized (Shin et al., 2020) in both primary and secondary care (Begg, 2020). Telehealth is an advanced method of using telecommunication technology to facilitate treatment, follow-up, and maintaining a high quality of wound management in primary care (Armstrong et al., 2020, Ndip et al., 2010). The significance of telehealth in diabetes treatment became more apparent during the COVID-19 epidemic (Al-Sofiani et al., 2021). Telehealth can be an innovative way to wound care that
addresses issues such as resource utilization and management policy in health care (Chanussot-Deprez & Contreras-Ruiz, 2013). The accessibility of a digital platform in conjunction with visual gadgets and computer-based transmission of high-standard electronic pictures allows for the assessment of wound status (Smith-Strom et al., 2018).

**Problem Description**

The ongoing COVID-19 pandemic has raised significant problems for those caring for individuals with non-communicable diseases. The clinic management of diabetic patients and associated consequences is a major challenge in this climate as regular in-person outpatient settings have been temporarily discontinued. Considering the importance of protective measures for those with diabetes as a high-risk population, social distancing is seen as the best way to minimize exposure to the virus (Shin et al., 2020).

Remote monitoring is recommended as part of the support tools for the safety of patients (Shin et al., 2020). In the current situation of isolation and lack of access due to pandemic restrictions, screening can be implemented using technology such as telehealth to link patients and clinicians while adhering to social distancing measures (Cerqueira et al., 2020). Furthermore, access to diabetic foot specialist groups continues to be a constraint for some geographical populations such as those living in rural areas. As a result, online specialist consultation with digital imaging for diabetic foot ulcer management should be made accessible in distant regions, highlighting the importance of telemedicine use in diabetic foot care (Lazzarini et al., 2010).

The American Podiatric Medical Association lately highlighted the significance of appropriate care of diabetic foot wounds and other problems and hypothesized how these could be treated in various settings, including home, during this epidemic (Rogers et al., 2020). The importance of thoroughly inspecting the feet of diabetic patients is essential. Patients with
diabetic peripheral neuropathy are less probably to seek treatment in the E.R. when required, therefore attention to very high-risk patients is critical in times of less access to care. Clinical experiences during the lockdown period have shown the importance of preserving the art of clinical practice in respect of history taking, thorough examination, and prevent delayed treatment which can lead to the loss of lives and limbs (Shin et al., 2020).

**Local Problem**

For the DNP project, the absence of diabetic foot screening and the low rate of patient’s foot care instruction had been observed at a volunteer-run virtual clinic. Before the COVID-19 pandemic, a diabetes educator at the clinic was screening, performing a foot exam, and completing the documentation on diabetes patients prior to being seen by providers. This process has not been possible since the COVID-19 pandemic started because the telehealth visit replaced the patient’s in-person visit.

**Setting**

For this change of practice quality improvement DNP project, a volunteer-run primary care clinic located in the Central Coast of California was selected. The patient population covered by this clinic included adults, mainly the Hispanic population. Patients were being visited virtually by six MDs, four NPs, and one PA who work in this clinic as a volunteer provider on Wednesday evenings.

**Specific Aim**

The aim of this quality improvement project was to create, implement, and evaluate an educational program for diabetic foot ulcer screening in a virtual primary care clinic environment. The objectives included improving the health care provider’s confidence by 25%
and increasing the health care provider’s willingness to restart DFU screening by 25% after providing one-day educational intervention.

**Available Knowledge**

**PICO Question**

The following question guided literature review that supported the project: Among health care providers, will implementing an educational program about a diabetic foot care screening in a virtual primary care clinic, improve health care provider confidence and increase the likelihood of performing DFU screening when compared to the current practices?

**Search Methodology**

A comprehensive database search of CINAHL, Cochrane/ DARE, PubMed, Ovid, and Evidence-Based Journals was conducted. Search terms included diabetic foot ulcer, education, telehealth, assessment, screening, health care provider. Primarily, a total of 357 studies were found. Inclusion criteria were research articles from any country, written in English, focusing on adult patients over the age of 19, and examining the need for and value of a diabetic foot ulcer screening via telehealth for health care practitioners. After a thorough analysis, seven research evidence were selected based on the inclusion requirements. The Johns Hopkins Nursing Research Evidence Appraisal Tool was used to evaluate the research studies (Dang & Dearholt, 2017). The quantitative and qualitative articles reviewed included strength of evidence A, B, and quality levels I and III (Appendix C).

**Integrated Review of the Literature**

**Preventative and early intervention on DFUs in primary care**

Health care professionals have an essential role in helping people with diabetes with their foot health. With podiatrists routinely depending on health care practitioners’ referrals for patient
consultations, it is significant that HCPs follow best practice preventative foot care guidelines. It is necessary to identify and consider the obstacles to promote best practice foot management within primary care. For instance, to perform a foot examination, shoes and socks need to be taken off, and people with diabetes should have a foot screening at least annually (Mullan et al., 2019).

**Telehealth and Diabetic foot care**

Using telehealth method empowers the health care practitioners to approach their patients with diabetic foot wounds with greater awareness, improved wound exam abilities, and increased confidence. Telehealth enhances coordination between the levels of health care providers and helps them see their patients more holistically. While the images are the most important part, written content in an online wound record is essential for a better understanding of the image (Kolltveit et al., 2016). A store-and-forward telehealth system (it is a type of telehealth technology using applications of clinical images) was introduced into diabetic foot care, and it appeared to be a valuable strategy for improving diabetic foot care, specifically, access to specialty services. The findings supported other diabetic foot telehealth research which was significant economical saving with positive effects on clinician, service delivery, and patient outcomes (Lazzarini et al., 2010). Telehealth can be a viable option and complement standard treatment and has been shown to compare favorably with regular outpatient care in regards of wound healing duration, the rate of amputations, deaths, monthly consultations, and patient satisfaction (Smith-Strom et al., 2018). Clinical assessment of digital photographic images is the foundation of telehealth programs to enable patients with diabetic foot wounds in their self-management away from the outpatient setting. However, cell phone pictures may not be as valid or reliable as directly viewing the wound as an independent indicative tool for remote assessment
of diabetic foot ulcers. Providers should obtain as much additional information as feasible when making treatment recommendations based on these pictures (Van Netten et al., 2017).

**Telehealth and COVID-19 pandemic**

*Telehealth Clinic Model*

The significance of telehealth in diabetes management became more noticeable during the COVID-2019 lockdown. Al-Sofiani et al. (2021) developed a Diabetic Telehealth Clinic Model. The results from surveys of both patients and health care clinicians revealed high satisfaction with the telehealth model and willingness to continue using this care model after the COVID-19 situation is passed. They effectively minimized the number of patients, providers, and staff at the in-person clinics without compromising the standard of treatment provided to patients or their satisfaction with the visits. Patients and health care providers agreed that the visits in the Diabetes Telehealth Clinic were more patient-centered than the traditional face-to-face clinic. Patients were involved in the online visits because they had to send their everyday blood glucose records to their providers ahead of time, learn how to transfer the information from their gadgets, and submit virtual inquiries and questions to the outpatient setting. Nonetheless, it is fundamental to maintain high levels of patient safety and take the appropriate measures to protect against the loss of patient privacy.

*COVID-19 impact on the assessment of foot ulcers*

The COVID-19 pandemic has brought about the close of most outpatient facilities and failure to perform most laboratory and imaging studies. These closures have caused a change in the way that diabetic foot ulcers are treated. Shin et al. (2020) exhibited a clinical experience in two centers with a significant interest in the treatment of diabetic foot problems—including online consultations (provider-to-patient and provider-to-home nurse telehealth) and home podiatry
visits during the coronavirus epidemic. The findings show potential for new possibilities in models of management for the diabetic foot. This clinical experience has revealed the importance of maintaining the art of clinical practice with regards to taking a history, observation, and vigilant assessment. The results, however, indicate that we must remain careful with patients and interventions rapidly to avoid high-risk problems.

**Summary/Synthesis of the Evidence**

The research suggests that practitioners’ need to conduct yearly foot screening on all patients with diabetes is essentially notable. By performing diabetic foot examinations and identifying those at risk for complications, the quality of treatment for patients with diabetes will be enhanced, and the maximal level of functioning will be encouraged by preventing foot problems. Telehealth is a well-established method of utilizing advancing telecommunication technology to obtain and disseminate medical information and services. Over the past few years, there has been much interest in the broad integration of telehealth to allow diabetes self-care, patient education, and support. Furthermore, telehealth enables remote contact between health care practitioners in primary and specialized care, therefore eliminating the requirement for patients to visit the hospital.

**Rationale**

Kurt Lewin’s Change Theory (Butts & Rich, 2015) and Kotter’s Change Management Model (Campbell, 2008) served as the directing frameworks for this project (Appendix J). The Kurt Lewin’s Change theory is a modern organizational theory incorporating the three levels of unfreezing, moving, and refreezing. Lewin’s interest aiming on variables that impact individuals to change. Lewin suggested a three-stage model of change that involves discarding previous
learning and replacing it with new habits to make the transition efficient (Petiprin, 2015).

Unfreezing is the process of moving away from old inefficient habits and lowering resistance to change. This progression is indispensable for previous behaviors to be resigned with the goal that new behaviors can be learned. Once unfreezing happens, plans can be created to coordinate behaviors toward a new path that will lead to minimal resistance to change. Moving is the process of driving the change forward and introducing more acceptable and efficient habits. Moving may include changing beliefs, feelings, or habits. Refreezing is known as accepting the modification and enforcing the new habits to become constant and routine. According to this theory, Lewin outlines the change as a dynamic force within the organization that proceed in an opposite path. Change must be accepted as essential for success and transformation before it can take place (Butts & Rich, 2015).

Kotter’s Change Management Model describes processes and principles for involving individuals and organizations to encourage both willingness and capability, hence increasing the possibility that the virtual DFUs screening would be adopted. There are eight steps in this dynamic model, which can be divided into three stages. The first stage is “creating a climate for change” and includes developing a feeling of urgency, forming a guiding coalition, and formulating a vision and strategy. The second stage is “involving and enabling the organization” and includes articulating the vision, motivating action, and achieving short-term goals. The final stage is “implementing and supporting the change”, which entails consolidating benefits and promoting additional change and embedding new techniques into the culture (Campbell, 2008).
Utilization of the Model

Previously, the practitioners used a routine for foot assessments and a strategy for risk evaluation to identify patients at risk for developing foot problems in the primary care setting used in this project. Since the online clinic began, there had been inconsistencies among providers in conducting foot screening and documenting them in the electronic medical record, unless the patients complained of foot complications. The project aimed to be more proactive in implementing screening and early approaches rather than reacting after foot complications occur. The Change Theories were used to direct this project by improving the foot management practices of the clinicians in the primary care setting. Based on the Kurt Lewin’s Change Theory, those concerned need to recognize that their existing method, which was the basis of the unfreezing phase, and according to Kotter’s Change Management Model, which was a sense of urgency, the need for change. When this was realized, the movement step began by teaching the clinic providers on implementing a foot screening tool at least yearly, as suggested by the ADA (Boulton et al., 2008). A reminder was available in the patients’ electronic charts to alert practitioners when diabetic foot screening was due. The clinicians were taught conduct risk screening virtually on all patients with diabetes to recognize those at risk for foot problems and refer them to a podiatrist on time. Finally, once clinicians were trained and practicing these new habits, the refreezing stage and implementing and sustaining the change phase began.

Methods

Context

An assessment survey was created to explore the baseline data on the existing confidence and willingness to practice diabetic foot wound prevention and management and compare it to after learning the module.
The project involved a range of stakeholders, including patients with or without diabetic foot ulcers, the clinic’s medical director for approval of the project, the nurse practitioner specializing in diabetes as a mentor, medical doctors, nurse practitioners, and a physician assistant in primary care as participants.

**Description of the Intervention(s)**

The original plan was to educate the HCPs of the clinic on a 30-minutes asynchronous educational module (PowerPoint) (Appendix O) and how to screen and assess diabetic foot virtually by using a modified diabetic foot screen form from the original screening form existing in the project’s setting (Appendix L). However, after discussion with the clinic’s Medical Director, due to constrict time of HCPs, the educational module was shortened to 15-minutes (Appendix P) on foot screening questions (Appendix M) (instead of diabetic foot screen form), red flags for referral, management, recommended patient education, and patient chart documentation. Diabetic foot screening and assessment was also substituted with diabetic foot screening. To prepare a patient educational brochure, multiple examples were found and reviewed from sources like John Hopkins Diabetic center, Centers for Disease Control and Prevention, Human Resources and Services Administration (HRSA), Novo Nordisk Inc., Johnson and Johnson company, DNP Scholarship Repository projects, and Diabetes Foot health care instruction sheet which was being used at this DNP project clinic before pandemic. Finally, an instructional handout from a DNP repository project (Bakhshi, 2019) was selected because it contained a comprehensive information for diabetic foot self-assessment by patients with pictures and it was in English and Spanish. It was minimally modified and introduced to the clinic to send to patients describing how to do routine foot care at home, monitor feet daily, and report complications (Appendix N). Additionally, a reminder flag on the electronic health record
(EHR) of all diabetic patients were prompt practitioners to conduct foot screening when they were due. A total of 11 providers were contacted via email to participate in the project. Finally, four HCPs completed an assessment survey prior to the educational program and the final feedback questionnaire afterward.

**Gap Analysis**

The clinic practitioners saw a large number of Hispanic (mainly) and non-Hispanic patients (269 patients from January 2020 till April 2021) as well as a high volume of diabetic patients (140 patients from January 2020 till April 2021). Furthermore, this DNP candidate requested the most recent number of diabetic patients from clinic administrative, but it was not delivered due to the clinic’s work overload. Low education and income are linked to higher levels of noncompliance (Kassahun et al., 2016), and patients need continuing instruction and self-management education to care and sustain their optimum health (Funnell & Anderson, 2004). Research findings showed an improvement in foot treatment awareness and self-management skills in individuals with diabetes as an outcome of engaging in foot treatment educational programs (Bonner et al., 2016; Cousart & Handley, 2017). Consequently, diagnosis, treatment, and follow-up of diabetic foot complications need regular clinical assessment and observation (Singh et al., 2016). The COVID-19 worldwide pandemic has introduced numerous problems in the treatment of people with diabetes. Accordingly, the cancellation of most outpatient clinics has put patients with diabetic foot ulcers at risk (Shin et al., 2020).

The level of foot management awareness and practice are affected by education, regular monitoring, and instruction about diabetic assessment (Li et al., 2014). Lack of diabetic foot exam and foot management teaching were observed during telehealth visit at the project’s
setting. Therefore, there was a need in this clinic to resume screening of diabetic patients’ feet by HCPs and educate patients to better self-care their foot management (Appendix D).

**Gantt Chart**

The Medical Director approved the clinic project in February 2021 (Appendix B). Literature review was completed in March. The project leader created an educational module, a pre- and post-test, and selected a foot care brochure in April and May 2021. The educational module was emailed to the Medical Director and the N.P. specializing in diabetes for their feedback in the month of June, and then to all providers (n=11) to study at their convenience in the month of July 2021. The pre- and post-learning surveys were completed by four participants in July 2021. The Gantt chart is presented in Appendix E.

**Work Breakdown Structure**

The following work breakdown structure (Appendix F) was developed to manage the design and monitoring plan. The deliverables included contacting the management and clinical group at the project setting, performing gap analysis, reviewing literatures, creating PowerPoint slides to educate clinicians (self-study) on the significance of implementing a foot screening via telehealth, online encountering with the informational technology group, searching and selecting best teaching material for diabetic patients in Word format, and obtaining questionnaires from participants before and after the learning module.

**Responsibility/Communication Matrix**

This DNP candidate was in charge of the project, developing the learning module, and questionnaires. The progress and implementation of the project was reported directly to Dr. Jo Ann Loomis, the University of San Francisco advisory leader. The member of DNP committee was Dr. Elena A. Capella. The clinic setting’s advisory members were the Medical Director and
mentor (NP specializing in diabetes). The participants were health care providers (MDs, NPs, PA) at the Clinic (Appendix G).

**SWOT Analysis**

A SWOT analysis was explained and shown in Appendix H.

**Strength.** An educational material on diabetes for Spanish and English-speaking patients was already available in the clinic that needed to be updated for self-foot care and screening. Additionally, there was an existing screening diabetic foot form in the clinic for the English-speaking providers that was adjusted for implementation in a virtual clinic. However, it was more practical for providers to ask diabetic foot screening questions rather than completing a form in a virtual visit. The patient population was primarily Spanish-speaking, and a few practitioners were fluent in speaking the Spanish language. Otherwise, a translator was available for non-Spanish-speaking providers. As a result, patients perceived a positive environment and had confidence in the medical decisions. The management team were collaborative with the project leader and opened to change.

**Weaknesses.** During telehealth visit, patients were receiving limited education on foot care if there was a concern. Besides, patients were not receiving any material on diabetic foot care. The patients were underserved with low socioeconomic status.

**Opportunities.** Foot care education could assist patients to develop a greater awareness of diabetes and enhance their self-care abilities, leading to better health outcomes. Diabetic foot screening could reduce the rate of emergency room visits and hospitalizations (Bakhshi, 2019).

**Threats.** HCP’s eagerness to implement online foot screening, referral, and education were a challenge. Providers’ scheduled time for each patient was constricted, and foot screening and
education were time-consuming. In addition, patients could be reluctant to have their feet screened because of poor foot hygiene and wearing shoes (Bakhshi, 2019).

**Budget and Financial Analysis**

The project cost included the DNP candidate’s time. It was estimated that the 10 hours designing instructional material, 10 hours pre/post assessment, and 10 hours data collection and analysis would cost $2400 ($80/hour). Additional costs included costs for participating providers’ time ($110/hour for MDs, $80/hour for NPs based on google search, one hour for each four participants-three MDs and one NP) and educational handout for patients as a potential cost for clinic ($10/each patient). From January 2020 till April 2021, the number of diabetic patients seen by HCPs was 140 patients (approximately 9 patients/month). The expected number of diabetic patients seen by HCPs at the end of 2021 would be 108 diabetic patients (9 patients x 12 months). The cost of printing educational handout for patients would be $1080 per year. The total cost of the project would be around $3890 (Appendix I).

**Return on Investment**

Low-cost interventions for DFU primary prevention, such as self-awareness of risk factors (like the touch test) and printed pamphlet, result in small reductions in DFU incidence and are cost-effective. These interventions would reduce DFU incidence by at least 10% in people with diabetes who are at moderate or high risk for DFUs, at a cost of less than $150 per individual per year. In addition, the cost-savings for patient with diabetes in general would be a 25% reduction in DFU incidence at a prevention cost of <$50 per person per year (Barshes et al., 2017). It was anticipated the number of patients with diabetes seen by HCPs at the end of 2021 would be 108 diabetic patients. If the HCPs would avoid one foot complication, this project would help to save approximately $50 per patient or a total of at least $5400 (108 patients x $50)
annually. On the other hand, routine screening of diabetic foot and teaching the patients on foot management in primary care settings is expected to reduce the number of patients visiting ER or admitting in the hospital which is cost-effective to the patients and health care system.

**Study of the Interventions**

**Implementation**

Once written permission was obtained from the project clinic, the DNP candidate began reviewing existing diabetic foot screening form and patient foot-care instruction sheet at the clinic. The DNP student understood there was a gap in performing foot screening of patients with diabetes and providing foot-care education by HCPs during remote-visit. After searching various resources, an evidence-based educational handout (in English and Spanish) for patients was selected and introduced to the clinic outlining regular foot management to perform at home, how to inspect feet on a daily basis, and foot problems to report. The actual diabetic screening form was modified and submitted to the Medical Director of the clinic for review. It was concluded that it would not be practical to utilize the form online since it was a hardcopy and time-consuming to fill it out by the providers. Instead, asking diabetic foot screening questions verbally and including the patient responses in EHR was more feasible. In addition, a 30-minutes asynchronous learning PowerPoint was created to educate the providers on virtual evaluation and frequency of diabetic foot screening, recommended patient teaching, referral to wound care clinic/podiatrist if patient meets the red flags, and patient chart documentation. The learning module after discussion with the Medical Director was minimized to 15-minutes due to constrict time of HCPs. The implementation of the project started by coordinating with the Medical Director and sending the module to the participants via email. A pre- and post-questionnaire were used to evaluate the project goals. The questionnaire was created based on a 5-point Likert scale to assess providers
confidence and likelihood of performing diabetic foot screening, passing on educational brochure to patients with diabetes, and documenting foot screening in EHR before and after learning module.

**Outcome Measures**

Proposed outcome measures were as followed:

- To increase the health care practitioner’s confidence level by 25%.
- To improve HCPs eagerness to implement diabetic foot ulcer screening by 25%.

Anticipated outcomes:

- Practitioners and administration supported the implementation of the project (Bakhshi, 2019)
- Practitioners were interested to learn educational module and complete surveys
- Clinicians restarted practicing diabetic foot care program

**Proposed CQI Method and Data Collection Tools**

To measure outcomes, a pre- and post-survey (Appendix K) were developed based on ranking options. The pre-survey and post-survey questions were chosen after reviewing questionnaires utilized by various DNP projects (Bakhshi, 2019; Richardson, 2017; Torres, 2020). The surveys were not validated due to lack of time. The survey was composed of questions using a 5-point Likert scale, with responses ranging from 0 to 4, with 0 indicating strong disagreement and 4 indicating strong agreement. Data collected from the surveys compiled into a Microsoft Excel spreadsheet for analysis. Word Document utilized to develop teaching materials and pre- and post-tests. PowerPoint software used for creating the learning module.

**Analysis**
The implementation of an asynchronous learning module allowed HCPs to resume virtual diabetic foot screening and teaching patients according to best practice. The educational module and pre- and post-test were implemented online. The data collected from surveys were transferred to Excel for statistical analysis.

**Ethical considerations**

The DNP project approval by the USF Institutional Review Board (IRB) for the Protection of Human Subjects was not required because this quality improvement project was deemed non-research and the patients were not involved in the project directly. Therefore, the project approval form, including a Statement of Determination (Appendix A), was completed by the student, and were authorized by the DNP chair and committee.

This project also addressed USF values, as a Jesuit Catholic college, to commit, involve, and promote public health by advancing social justice and improving the health of a vulnerable and underserved population in the area located in the Central Coast of California.

Based on the American Nurses Association’s Code of Ethics for Nurses, the nurse upgrades and support the patient’s rights, health, and safety. This provision reflects nursing professional advocate high-standard care for all patients and population. This DNP project emphasized on educating providers on virtual diabetic foot screening in order to provide greater quality of care to patients and enhance their health consequences.

The purpose of the project was explained to the participants via email. They were given an opportunity to withdraw from the project without giving a reason, they were assured that anonymity and confidentiality of information were protected. In addition, there was no potential conflict of interest by implementing this project.
Results

The project plan was changed prior to implementation. The original plan was to instruct the providers on a 30-minutes asynchronous comprehensive learning module. Virtual diabetic foot screening and assessment form, frequency of diabetic foot exam, DFUs management, recommended patient teaching, referral to wound care clinic/podiatrist if patient meets the red flags, follow up, and EHR documentation were all covered in the content. After discussion with the Medical Director due to restricted time of health care providers, the learning module was reduced to 15-minutes, and diabetic foot screening and assessment form was changed to four essential diabetic foot screening questions. The modified PowerPoint included diabetic foot screening questions, red flags for referral, and DFUs management (including requesting a foot image if necessary, giving patients a foot care brochure, referring/following up, and documentation).

The project objectives focused on increasing the HCPs confidence level by 25% and improving HCPs eagerness to implement diabetic foot ulcer screening by 25%. The educational module was sent to 11 HCPs (six MDs, four NPs, one PA). The DNP student conducted a survey before and after completing the educational module by participants. A total of four practitioners (36.4%) completed and returned the pre- and post-surveys. The data was collected on data collection worksheet and exported into a Microsoft Excel spreadsheet for analysis.

The discovered pre- and post-survey results were significant. The outcome showed the confidence level of the HCPs to perform screening of diabetic foot ulcers on the remote visits raised from 75% before to 93.75% after participating in educational program. The rate of providers willing to perform screening of diabetic foot ulcers on the telehealth was same at pre- and post-learning program (93.75%). The project leader noted a great increase in participants
responses to two questions: whether they distribute the foot management educational material to diabetic patients and whether they document diabetic foot screening in the athenaNet during distant visit. Both revealed a grow from 62.50% prior to participating the educational workshop to 93.75% thereafter.

**Discussion**

**Summary**

The COVID-19 outbreak caused a sudden change in the delivery of medical services to outpatient settings. During the pandemic, telephone/video outpatient consultation have been utilized for chronic disease management including diabetes. Singh et al (2016) noted diagnosis, treatment, and follow-up of diabetic foot complications require regular clinical examination and monitoring. Poorly management of foot ulcer is the main cause of limb amputation and prolonged hospitalization. Their study findings showed telehealth diabetes foot-management was certainly valued by both health practitioners and patients. A clinical experience during COVID-19 lockdown in Manchester and Los Angeles showed a significant rise in the utilization of telehealth consultations for diabetic foot at both centers, with noticeable reductions for face-to-face visits (Shin et al, 2020).

This project’s clinic had been using the telehealth since pandemic lockdown began. The aim of this quality improvement project was to examine health care practitioners’ confidence and readiness to resume diabetic foot screening and patient instruction on distant visit. The pre- and post-survey findings revealed that the providers confidence increased by %18.75, but their willingness was high (%93.75) and did not alter between before and after engaging in learning module. However, the willingness of HCPs to present diabetic patients
with a foot-care educational leaflet and to document diabetic foot screening in the EHR during an online visit grew by %31.25.

The project outcomes supported Kurt Lewin’s Change Theory and Kotter’s Change Management Model. The finding demonstrated lack of diabetic foot screening in telehealth visit constituted the clinic gap. The educational module was a moving phase and created a climate for change. It engaged the participants and raised the practitioners’ awareness to resume diabetic foot-care program. The Medical Director reminding email to all clinic’s providers and restarting remote DFUs screening (after post-survey) by the clinicians demonstrated refreezing step of Kurt Lewin’s Change Theory, as well as implementing and maintaining the change phase of Kotter’s Change Management Model.

Interpretation

At the project’s clinic, volunteer health care providers visit the vulnerable patients once per week for 3-4 hours. The patient population is quite large. The project’s results presented that the instructional module improved practitioners’ confidence, willingness to educate patients, and document foot screening in athenaNet. An unexpected finding of project was clinicians’ likelihood to perform diabetic foot screening during visiting patients online. The outcomes showed it was high prior to educational workshop and remained the same afterwards. As a result, the main reasons for the cessation of diabetic foot screening at this clinic since the telehealth visit began could be the large number of patients, the shortage of practitioners (all HCPs were volunteers), and limited time available to HCPs.

This DNP project was a matter of motivating and enhancing the quality of care at this primary care setting. The Medical Director support, administrative assistance,
and clinicians’ willingness to restart the DFUs screening were the strengths of this project. After post-survey, the DNP candidate noticed a policy change in the clinic as the Medical Director began encouraging HCPs to perform diabetic foot screening, patient education, and sending patients a self-foot care teaching brochure, as well as electronic documentation of the foot screening results. He included it in his weekly email to all HCPs as a reminder. Furthermore, the DNP student observed primary care clinicians started conducting online foot screenings on their diabetes patients.

**Limitations**

The obstacles to implementing foot screening during a telehealth visit at the clinic included the lack of clinicians (all HCPs were volunteers) and time constraints. Time constraints were alleviated by educating providers on only asking key diabetic foot screening questions instead of completing the foot screening form. Increased education and experience may address the resistance of health care practitioners to change professional roles and expand their scope of practice (Mullan et al., 2019). Additionally, the brochures and sending them to patients for foot self-assessment and self-care would help providers in managing their time to screen and educate patients. Since majority of patients only spoke Spanish, leaflets were issued in English and Spanish to overcome the language barrier. Patients’ apprehension about having their feet inspected as a result of poor foot cleanliness and wearing shoes was alleviated by including instructions in their self-care pamphlets that their feet would be evaluated during their appointment (Bakhshi, 2019).

Furthermore, using of a hard copy foot screening template required manual completion and scanning into the patient record in order to track foot exam performance. This workaround may reduce the likelihood of diabetic foot screening while also increasing staff and clinician workload.
(Trevino, 2020). After consulting with the clinic’s Medical Director, the issue was improved by only asking a few foot-screening questions during telehealth visit and documenting it on patient’s Review of System section.

**Implications**

Improving current practice by encouraging clinicians to perform virtual foot screening on a regular basis, record the outcomes in the electronic chart, provide foot health instruction to diabetic patients, and refer DFUs with red flags to a primary care organization could improve health consequences of patients with diabetes. This project highlights the significance of foot management for diabetic patients in virtual primary care and can serve as a model for other telehealth primary care settings.

**Recommendations**

One recommendation for future projects is to replicate this quality improvement project in a different virtual primary care setting and for a longer period of time. Implementing this project at other primary care practices with the same area for improvement could benefit larger number of patients with diabetes and implementing the project for a longer time could enlist participation of a larger number of clinicians.

Another recommendation is to study this project over the course of a longer time. Because of lack of time, the DNP student was unable to follow up and evaluate the results of using four key questions as an effective diabetic foot screening tool, as well as validate pre- and post-surveys. Future projects could use a verified pre- and post-questionnaire and investigate the outcomes of the current DNP project. Extending the study’s timeline would allow researchers to determine if the foot care program lowered the occurrence or severity of problems like wounds or amputations.
A final recommendation is that future projects incorporate a chart review as a screening tool. A chart review would provide a more accurate diabetic foot screening while also improving the quality of results.

**Conclusions**

Foot ulcers are one of the most prevalent and preventable consequences of diabetes mellitus, which result in 20 percent of amputations (Armstrong et al., 2017). Clinicians can make a great impact on the quality of a diabetic patient's life. Evidence-based interventions identified by the health care team to promote foot health and diabetes management at the primary care level include regular foot screenings, foot health instruction for diabetics during patient contacts, accurate recording, and referral to a specialist. This DNP project aimed to evaluate health care professionals’ confidence and willingness to perform diabetic foot screening via telehealth, educate patients, and refer complicated cases to wound care clinics/specialists. Based on the findings of this project, the DNP student concluded that continuing foot management program in a virtual primary care setting is feasible and can improve the quality of diabetic foot care interventions among health care professionals, as well as patient’s quality of life.

**Funding**

The DNP student received no financial support for research, authorship, and implementation of this project.
References


Bakhshi, M. (2019). Implementing Foot Care Program in a Rural Clinic. Doctor of Nursing Practice Project, University of San Francisco. University of San Francisco Scholarship Repository.


https://www.cornerstones4care.com/content/dam/c4c

https://doi.org/10.1016/j.nurpra.2016.11.009

Culeghais3. (2014). Change-law of nature: Are the leaders prepared to tackle this law?


Johns Hopkins Medicine. (N.D.). Diabetes Education: Foot Care for People with Diabetes.

https://www.hopkinsmedicine.org/gim/core_resources/Patient%20Handouts/Handouts_May_2012/Foot%20Care%20for%20People%20with%20Diabetes.pdf


https://doi.org/10.1186/s12902-016-0114-x


Richardson, J. (2017). Implementing a diabetic foot care program in a primary care clinic. Doctor of Nursing Practice Project, College of Nursing and Speech Language Pathology Mississippi University for Women. Mississippi University for Women Scholarship Repository.


guidelines/view-all-racgp-guidelines/management-of-type-2-diabetes/introduction/introduction

Torres, Z. (2020). Wound Care Education for Primary Care Providers at a Regional Medical Center. Doctor of Nursing Practice Project, University of San Francisco. University of San Francisco Scholarship Repository.


Appendices

Appendix A: IRB and/or Non-Research Approval Documents (Statement of Determination)

Doctor of Nursing Practice

Statement of Non-Research Determination (SOD) Form

The SOD should be completed in NURS 7005 and NURS 791E/P or NURS 749A/E

General Information

<table>
<thead>
<tr>
<th>Last Name:</th>
<th>Naderi Asiabar</th>
<th>First Name:</th>
<th>Zahra</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWID Number:</td>
<td>20524926</td>
<td>Semester/Year:</td>
<td>Spring/2021</td>
</tr>
<tr>
<td>Course Name &amp; Number:</td>
<td>NURS 749B Qualifying Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chairperson Name:</td>
<td>Dr Jo Ann Loomis</td>
<td>Advisor Name:</td>
<td>Dr Jo Ann Loomis</td>
</tr>
</tbody>
</table>

Project Description

1. Title of Project

   Implementing a Diabetic Foot Care Program in a Virtual Primary Care Clinic

2. Brief Description of Project

   Clearly state the purpose of the project and the problem statement in 250 words or less.

   Diabetic foot ulcers (DFUs) as a complication continue to be a significant and widespread healthcare concern. The annual rate of foot ulcers is about 3% with the lifetime chance of developing a foot ulcer as high as 25% (Morris, 2019). Preventing DFUs and other complications of diabetes requires effective management by practitioners and patients. Primary care providers should provide the first intervention and initiate early referral to specialist care according to the complexity of individual cases (Meloni et al., 2019).

   The value of telehealth in diabetes treatment became more obvious during the COVID-19 pandemic (Al-Sofiani et al., 2021). Telehealth can minimize the quantity of consultations in specialty health care by moving therapy and follow-up to primary health care while maintaining high quality of wound management (Armstrong et al., 2020, Ndip et al., 2010). The purpose of this project is to promote the primary healthcare practitioners’ (HCPs) confidence level and improve their willingness level to implement online DFUs screening and assessment, referrals, documentation, and patient education after one-day self-study of an educational module.
References


AIM Statement: What are you trying to accomplish?

- What do you hope to accomplish with this project? Aims should be SMART, specific, clear, well-defined, and at a minimum describe the target population, the desired improvement, and the targeted time frame.
- To improve (your process) from (baseline)% to (target)%, by (timeframe), among (your specific population)

*Complete this statement:*

For the DNP project, RotaCare clinic in Monterey is selected. Before the COVID-19 pandemic, a diabetes educator at clinic was screening and performing a foot exam on diabetes patients prior to being seen by providers and a foot screen form was completed by the educator or the provider. This process has been stopped since the COVID-19 pandemic started because the patient in-person visit is replaced by the telehealth visit. The eligible participants for the project will be M.D.s, N.P.s, and P.A.s who work in this clinic as a volunteer.

The overall goal is to improve the healthcare professional’s confidence level and improve their likelihood level to implement online DFUs screening and assessment, referrals, documentation, and patient education after one-day self-study of an educational module. A pre- and post-survey assessment will be developed and existing patients’ educational material and screening and assessment form (in English and Spanish language) will be adjusted.

4 Brief Description of Intervention (150 words).

The clinic’s providers will self-study an instructional module about foot screening questions, frequency of diabetic foot assessment, recommended patient instruction, and patient chart documentation. An educational handout (in English and Spanish language) will be sent to patients describing regular foot management to perform at home, how to monitor feet daily, and problems to report. Additionally, a reminder flag on the electronic chart of all patients with diabetes will prompt clinicians to conduct foot assessment when they are due. A demographic questionnaire and an assessment survey will be completed by participants prior to educational program, and the final feedback questionnaire will be required afterward via email.

4a. How will this intervention be implemented?

- Where will you implement the project?
- Attach a letter from the agency with approval of your project.
- Who is the focus of the intervention?
- How will you inform stakeholders/participants about the project and the intervention?
The DNP project will be implemented in a clinic located in the Central Coast of California. The primary health care providers will be educated through a self-study PowerPoint module about importance of diabetic foot care and DFUs online screening and assessment skills.

The stakeholders will be contacted via zoom meeting and email. A copy of the project will be sent to Medical director and mentor (N.P. specializing in diabetes) of the clinic. The participants will be notified and educational module will be sent to them by email through the Medical director of clinic after receiving the approval for this project. The letter and approval from the Medical Director and mentor are attached.

5. Outcome measurements: How will you know that a change is an improvement?

- Measurement over time is essential to QI. Measures can be outcome, process, or balancing measures. Baseline or benchmark data are needed to show improvement.
- Align your measure with your problem statement and aim.
- Try to define your measure as a numerator/denominator.

Two outcomes will be used to evaluate the project’s effectiveness.

By January 1, 2022, develop, implement and evaluate an educational program for diabetic foot ulcer screening and assessment in a virtual primary care clinic.

- To increase the primary care practitioner’s confidence level by 25%.
- To improve primary HCPs eagerness to implement diabetic foot ulcer screening and assessment by 25%.

What is the reliability and validity of the measure? Provide any tools that you will use as appendices.

The primary method of analysis for this project will be comparing pre- and post-intervention data. Data collected will be both qualitative and quantitative data. Both the confidence level and willingness level of HCPs to perform DFUs virtual screening and assessment will be measured by comparing pre- and post-survey results using the Likert scale. The pre- and post-survey responses will be compared and measured whether the rates improved by 25%. The pre- and post-intervention questionnaires and the results will be provided as appendices.

The experts from USF will check the relevancy, clarity, comprehensiveness, and applicability of the tools (pre- and post-surveys, and screening form). According to their opinions, appropriate modifications will be done. Reliability will be assured by using the appropriate measures.

- Describe how you will protect participant confidentiality.

The purpose of the project will be explained to the participants and informed consent will be obtained from them to participate in this project. They will be given an opportunity to withdraw from the project without giving a reason, they will be assured that anonymity, and confidentiality of information will be protected. The project proposal is approved by the Medical director of the clinic.

Written permissions from the institutions as well as the ethics committee approvals were obtained in order to carry out the research. Oral and written informed consents of patients were also obtained by informing them about the aim of the study.
DNP Statement of Determination

Evidence-Based Change of Practice Project Checklist*

The SOD should be completed in NURS 7005 and NURS 791E/P or NURS 749/A/E

Project Title:

Improving Chronic Wound Management Outcomes Through Training
of Primary Care Providers

<table>
<thead>
<tr>
<th>Mark an “X” under “Yes” or “No” for each of the following statements:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>The aim of the project is to improve the process or delivery of care with established/accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>The specific aim is to improve performance on a specific service or program and is a part of usual care. All participants will receive standard of care.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>The project is not designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control. The project does not follow a protocol that overrides clinical decision-making.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does not develop paradigms or untested methods or new untested standards.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does not seek to test an intervention that is beyond current science and experience.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>The project has no funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., not a personal research project that is dependent upon the voluntary participation of colleagues, students and/or patients.</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: “This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board.”</td>
<td></td>
<td>✗</td>
</tr>
</tbody>
</table>

Answer Key:

- If the answer to all of these items is “Yes”, the project can be considered an evidence-based activity that does not meet the definition of research. IRB review is not required. Keep a copy of this checklist in your files.
If the answer to any of these questions is “No”, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:

http://answers.hhs.gov/ohrp/categories/1569

---

DNP Statement of Determination

Evidence-Based Change of Practice Project Checklist Outcome

The SOD should be completed in NURS 7005 and NURS 791E/P or NURS 749/A/E

Project Title:

Implementing a Diabetic Foot Care Program in a Virtual Primary Care Clinic

☐ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). **Student may proceed with implementation.**

☐ This project involves research with human subjects and **must be submitted for IRB approval before project activity can commence.**

**Comments:**

| Student Last Name: |  | Student First Name: |  |
|-------------------|  |--------------------|  |
| Naderi Asiabar    |  | Zahra              |  |

| CWID Number: |  | Semester/Year: |  |
|--------------|  |                |  |
| 20524926     |  | Spring/2021    |  |

| Student Signature: |  | Date: |  |
|--------------------|  |       |  |
| Zahra Naderi Asiabar |  | 03/29/2021 |  |

| Chairperson Name: |  |
|-------------------|  |
| Jo Loomis         |  |

| Chairperson Signature: |  | Date: |  |
|------------------------|  |       |  |
|                        |  |       |  |

DNP SOD Review Committee Member Name:  
DNP SOD Review Committee Member Signature:  
DNP SOD Review Committee Member Date:  
Appendix B: Letter of Support from Agency

March 3, 2021

Hi, Zahra.

I like your proposal and I appreciate your initiative. I do think, given the brevity of your rotation, that we should start with patients that are scheduled 1-2 weeks out, instead of a full month, so that you can gather adequate data.

Please coordinate with Claudia to get your instruction sheet to patients. There is already a foot care instruction sheet in Athena (English and Spanish versions) that you could use if you'd like.

Beginning next week, I will include a reminder to providers about thinking of foot care for our diabetic patients and introduce them to your project if you're ready by then.

Thanks so much,

Dr. T

Gregory Thompson, MD, MSc

Medical Director

RotaCare of Monterey

www.rotacarebayarea.org

831-682-6886

codrdocGT@gmail.com
Appendix C: Evidence Evaluation Table

<table>
<thead>
<tr>
<th>Purpose of article or review</th>
<th>Design / Method / Conceptual framework</th>
<th>Sample / setting</th>
<th>Major variables studied with definitions</th>
<th>Measurement of major variables</th>
<th>Data analysis</th>
<th>Study findings</th>
<th>Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examine obstacles &amp; enablers to providing preventative and early intervention foot care to people with diabetes, from perspective of HCPs within primary care.</td>
<td>Scoping review/ Electronic database search was undertaken of MEDLINE, CINAHL, Scopus databases, Google Scholar in September 2018.</td>
<td>N=339 studies in South Africa, Australia, Barbados, India, UK, Singapore, the USA. Eight research met criteria. Sample sizes= 5-843 HCPs.</td>
<td>DV: Obstacles; geographical, administrative &amp; communication variables; referral and care guideline; lack of experts and high-risk foot services; and time and funding shortage. Enablers: implementation of footcare programs; education; clear description of staff duties; set up of foot exam reminder systems; and reminders for</td>
<td>A reviewer’s electronic search approach was discussed with a knowledgeable research librarian</td>
<td>Scoping guideline: Preferred Reporting of Systematic Reviews and Meta-Analysis (PRISMA)</td>
<td>Significant ($P&lt;0.0001$) improvement in management of patient with diabetes in primary care. Number of performed foot screening grew from 40% before implementation to 63% afterward.</td>
<td>Recommendations by HCPs: -Implementation of foot- care programs -HCPs education &amp; training -Reminder systems for HCPs to perform foot exams -Reminders for patients to take their shoes off at appointments time Recommendations for more research with sufficient sample size: -Examine current preventative footcare initiatives in primary care -Understand how clinical practices influence healthcare system and</td>
</tr>
</tbody>
</table>

APA reference
patients with diabetes to remove their shoes at appointments

individual factors, and why best-practice evidence-based standards are not being implemented.

**Strength:**
Scoping of evidence was thorough and an in-depth reviewing procedure was undertaken.

**Limitation:**
Only English literature was included. All studies were conducted in different nations, with exception of two that was performed in the USA. Five of eight trials in this study had sample sizes of less than 20 persons.

**Critical Appraisal Tool & Rating:**
Johns Hopkins Research Evidence Appraisal Tool: III B
<table>
<thead>
<tr>
<th>Purpose of article or review</th>
<th>Design / Method / Conceptual framework</th>
<th>Sample/setting</th>
<th>Major variables studied with definitions</th>
<th>Measurement of major variables</th>
<th>Data analysis</th>
<th>Study findings</th>
<th>Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)</th>
</tr>
</thead>
</table>
| Learn about HCPs’ experiences with telehealth in early stages of treating DFUs. | Cluster randomized controlled trial (RCT)/ Interpretive Description (ID) as a methodological tool. Collection of data between 2014 and 2015 through focus group method. | Nurses (n=29), nurse assistant (n=1), podiatrists (n=2) & physicians (n=2) from home care, a nurse-led primary care clinic, medical center & outpatient hospital clinics. Participants had experience dealing with DFUs, & were in early stages of incorporating telehealth into their practices. | DV: Wound assessment knowledge and abilities, recording quality, communication between PHC & specialized health care | Semi-structured interview guide, coding process using an open-ended, inductive technique | Thematic analysis | -Improved wound evaluation knowledge & practices  
- Better recording  
- Improved coordination between PHC & specialized health care  
- Improved confidence  
- A better knowledge of how to detect a foot wound, treat it & report it.  
- Written electronic wound record is essential to better understanding ulcer pictures. | Strengths: Having various participants based on their workplace, experience with foot wounds, age & carrier, experiences & viewpoint on use of telehealth.  
Recommendations: If telehealth is more broadly adopted, it is necessary to provide education & training to all primary HCPs.  
Critical Appraisal Tool & Rating: Johns Hopkins Research Evidence Appraisal Tool: I A |

APA reference
<table>
<thead>
<tr>
<th>Purpose of article or review</th>
<th>Design / Method / Conceptual framework</th>
<th>Sample / setting</th>
<th>Major variables studied with definitions</th>
<th>Measurement of major variables</th>
<th>Data analysis</th>
<th>Study findings</th>
<th>Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examine how implementation of a telehealth store-and-forward system has increased access to diabetic foot experts and results for local providers</td>
<td>Pilot study/ The AUSCARE® diabetic foot store-and-forward telehealth system was introduced to participants between August 2009 and February 2010.</td>
<td>Eight participants, including podiatrists, diabetes educators, orthotists, MDs &amp; endocrinologist, who treated patients with diabetic foot problems on a regular basis.</td>
<td>DV: Simple to use, able to upload photos into AUSCARE®, used AUSCARE® for viewing images, AUSCARE® provided a secure storage area for clinical pictures.</td>
<td>Survey questions using a dichotomous (yes/no) or five-point Likert scale method</td>
<td>Descriptive statistics</td>
<td>100% of Participants responded:  - Telehealth system was simple to use.  - More access to diabetic foot specialized services (75%)  - Boosted upskilling of local diabetic foot care staff (100%)  - Improved patient outcomes (100%).</td>
<td>Strengths: Growing role of store-and-forward telehealth systems in management of diabetic foot problems  Limitations: Small sample size, suggesting findings should be interpreted with caution. Recommendations: - Need for larger scientifical study to determine impacts of using telehealth systems on diabetic foot practitioners, patients and cost.</td>
</tr>
</tbody>
</table>

APA reference
http://hdl.handle.net/10072/36166
Need for larger studies, Medicare rebates to investigate benefits of employing telehealth in diabetic foot care in all geographical groups.

**Critical Appraisal Tool & Rating:**
Johns Hopkins Research Evidence Appraisal Tool: I B
<table>
<thead>
<tr>
<th>Purpose of article or review</th>
<th>Design / Method / Conceptual framework</th>
<th>Sample / setting</th>
<th>Major variables studied with definitions</th>
<th>Measurement of major variables</th>
<th>Data analysis</th>
<th>Study findings</th>
<th>Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)</th>
</tr>
</thead>
</table>

**APL reference**

**Determine if telehealth follow-up of patients with DFUs in primary health care in conjunction with specialized health care was noninferior to standard outpatient care (SOC) in terms of wound healing duration.**

| Cluster-randomized controlled noninferiority Trial | Patients with DFUs: 182 adults aged 20 years or older (94/88 in telehealth/SOC groups) from endocrinology unit at Stavanger University Hospital, orthopedics/endocrinology unit at Haukeland University Hospital, and surgical unit at Stord County | DV: Wound healing, noninferiority, amputation, death, frequency of consultations | Generic Short Patient Experiences Questionnaire (GS-PEQ) with a response score on a 5-point Likert scale | -Cronbach a -Linear mixed model -SPSS-version 22, Stata-version 14, Function curves analyses. | -Healing time: telehealth was found to be noninferior to SOC. -Telehealth group had a remarkably lower rate of amputations. -No substantial differences in rate of deaths, rate of consultations, patient satisfaction, and healing time between groups. | **Strengths:** -Actual conditions in specialized and primary health care. -Only patients with a DFU were included and they were followed for one year. **Limitations:** Limited sample sizes. HCPs at outpatient clinics were not blinded in study. **Suggestions:** -Telehealth technology can be utilized as an option to traditional treatment. -When HCPs gain more experience utilizing telehealth...
<p>| frequency of monthly consultations, and patient satisfaction as secondary end aims. | hospital in 42 municipalities/districts. | -Using telehealth technology as a supplement to standard treatment, may be a realistic alternative for patients with superficial wounds. | technology, number of consultations at outpatient clinics decrease. -Telehealth benefits patients living far away from an outpatient clinic. It reduces burden of long-distance travel &amp; assures high-standard wound management. <strong>Critical Appraisal Tool &amp; Rating:</strong> Johns Hopkins Research Evidence Appraisal Tool: I A |</p>
<table>
<thead>
<tr>
<th>Purpose of article or review</th>
<th>Design / Method / Conceptual framework</th>
<th>Sample / setting</th>
<th>Major variables studied with definitions</th>
<th>Measurement of major variables</th>
<th>Data analysis</th>
<th>Study findings</th>
<th>Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)</th>
</tr>
</thead>
</table>

**Compare validity and reliability of remote assessment of DFU clinical characteristics and treatment decisions utilizing photographs taken with a cell phone to a live clinical assessment.**

- **Prospective diagnostic validity and reliability study:** 50 DFUs were photographed and assessed live. Five independent observers remotely assessed cell phone photos twice for presence of nine clinical characteristics and three treatment options.
- **IV:** Age, gender
- **DV:** Live visual assessment diabetes, comorbidities, foot disease features, most recent HbA1c, peripheral neuropathy, peripheral artery disease, medical history, DFU photos, treatment decisions
- **Queensland High Risk Foot Form (QHRFF)** Apple mobile phone i-phone 4
- **Free marginal multiroter Randolph’s kappa values**
- **Free marginal bi-rater Bennett kappa values**
- **SPSS version 23.0 software**
- **Review Manager**
- **-Cell phone photos for distant evaluation of DFUs have low validity and reliability and should not be used as a stand-alone diagnostic tool.**
- **Providers should obtain as much extra information as possible before making treatment decisions based on these photos, and they should be aware of poor**

**Strengths:** Involving several distant observers with varying levels of experience in care of diabetic foot wound.

**Limitations:** Despite live clinical evaluation is acknowledged as a reference standard; it can differ between observers. To avoid biasing remote observers, data on wound size, depth, and duration from the QHRFF was not included. Such information would not always be available in clinical
<p>| clinical evaluations | (RevMan) Version 5.3 Microsoft Excel | diagnostic of these images. | practice when patients took pictures at home. <strong>Recommendations:</strong> To increase diagnostic accuracy, explore strategies that can supplement cell phone images in any future research, instead of investigating higher resolution photos. <strong>Critical Appraisal Tool &amp; Rating:</strong> Johns Hopkins Research Evidence Appraisal Tool: I A |</p>
<table>
<thead>
<tr>
<th>Purpose of article or review</th>
<th>Design / Method / Conceptual framework</th>
<th>Sample / setting</th>
<th>Major variables studied with definitions</th>
<th>Measurement of major variables</th>
<th>Data analysis</th>
<th>Study findings</th>
<th>Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)</th>
</tr>
</thead>
</table>

APA reference

Create a simple, practical, and sustainable telehealth clinic over a short period of time utilizing tools that were available to practitioners and patients at the time.

| Quality Improvement project/ A Diabetes Telehealth Clinic protocol was developed, and a digital videoconferencing software (Zoom) used for most visits. | 145 patients and 14 HCPs participated in virtual clinic and 210 patients attended virtual instructional sessions. | IV: Age, gender | DV: Types of diabetes, most recent A1C, visiting from out of Riyadh, use of diabetes technology, type of visit, first-time user of telehealth, HCPs managing a visit. | Anonymous online satisfaction test rated on a five-point Likert scale after each telehealth visit and “Diabetes & Ramadan” virtual instructional session. | -chi-squared tests -t tests -Kruskal-Wallis test | -Statistically notable difference (P-value<.05) between audio & video conferencing. -97% of patients agreed using telehealth during pandemic was essential in maintaining their good glucose control. -88% reported they would continue using clinic in future. -Attendees in “Diabetes & | -Limitations: -Patients may find telehealth difficult to utilize, however, having a relative/friend attending during virtual visit makes process smoother. -Absence of physical examination and laboratory testing during a virtual clinic. **Recommendations**: -Telehealth role in diabetes management as a helpful supplement to face-to-face visits, rather than a substitute.
Ramadan” virtual educational session expressed high satisfaction.
- Majority of HCPs (93%) reported clinic protocol was simple without requiring any particular training before implementation.
- Minimized number of patients, HCPs, and staff physically presented in clinics without compromising their happiness with visits.

Explore clinical effects of this rapid adoption of Diabetes Virtual Clinic during corona pandemic on patients in future.

Critical Appraisal Tool & Rating:
Johns Hopkins Research Evidence Appraisal Tool: I A
<table>
<thead>
<tr>
<th>Purpose of article or review</th>
<th>Design / Method / Conceptual framework</th>
<th>Sample/setting</th>
<th>Major variables studied with definitions</th>
<th>Measurement of major variables</th>
<th>Data analysis</th>
<th>Study findings</th>
<th>Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)</th>
</tr>
</thead>
</table>

APA reference

Compare and contrast methods taken by two centers to treat diabetic foot problems, and how the service has evolved to meet pandemic’s obstacles.

Clinical review study/ A new model of clinical management (video & telephone consultation) was established for patients with diabetic foot problems during (and possibly after) pandemic. Patients’ outcomes were compared 6 weeks before and 6 weeks after pandemic lockdown.

Two centers with a great focus on treatment of diabetic foot problems at Manchester Royal Infirmary, Manchester, U.K., and the Keck School of Medicine of the University of Southern California (USC), Los Angeles, CA

IV: Age, gender, race
DV: Wound image, diabetes, comorbidities, gangrene, infection, amputation, debridement, oral antibiotics

Pre- & post-lockdown visit (clinic, telecare, home, hospital admission)

Data descriptions via case presentation

- Extensive use of telehealth consultation in both centers was successful.
- Significant reduction in rate of patients’ hospitalization in both facilities.
- Importance of obtaining a thorough history and examination was emphasized.

Conclusions:
Findings from these two centers suggest that diabetic foot management models may have new potential.

Recommendations:
Oral antibiotics alone may be effective in treating osteomyelitis as a DFU consequence, even with cellulitis. This may demand further revisions to international standards, and future studies should prove efficacy of this technique.

Critical Appraisal Tool & Rating: Johns Hopkins Research Evidence Appraisal Tool: I B

Definition of abbreviations:
HCP: Health Care Provider
DFU: Diabetic Foot Ulcer
SOC: Standard Outpatient Care
### Appendix D: Gap Analysis

<table>
<thead>
<tr>
<th>Current State</th>
<th>Desired State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients are vulnerable and need continuing education and self-care instruction</td>
<td>Enhancement of patients' self-care and health results via teaching on foot management.</td>
</tr>
</tbody>
</table>
| Absence of diabetic foot screening and less foot management instruction since beginning of telehealth visit during COVID-19 pandemic | -Health care practitioners’ confidence to perform foot screening increase by 25%.  
-Health care clinicians’ eagerness to implement diabetic foot ulcer screening improves by 25%. |
### Appendix E: Gantt Chart

<table>
<thead>
<tr>
<th>Activity</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet with stakeholders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholders Approval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literature Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan educational materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educating HCPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyze Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluate Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNP Paper Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNP Paper Presentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix F: Work Breakdown Structure

<table>
<thead>
<tr>
<th>Level I 1.1</th>
<th>Level II 1.2</th>
<th>Level III 1.3</th>
<th>Level IV 1.4</th>
<th>Level V 1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review diabetes literature 1.1.1</td>
<td>Meeting with management 1.2.1</td>
<td>Review educational brochures for patients 1.3.1</td>
<td>Contact with and introduce educational module to providers 1.4.1</td>
<td>Receive HCPs feedback 1.5.1</td>
</tr>
<tr>
<td>Perform a gap analysis 1.1.2</td>
<td>Meeting with NP specializing in diabetes 1.2.2</td>
<td>Modifying existing DFUs screening form 1.3.2</td>
<td>Perform first survey 1.4.2</td>
<td>Outcome metrics 1.5.2</td>
</tr>
<tr>
<td></td>
<td>Contact with Informational technology group 1.2.3</td>
<td>Creating educational module for providers 1.3.3</td>
<td>Self-study of module by HCPs 1.4.3</td>
<td>Project results 1.5.3</td>
</tr>
<tr>
<td></td>
<td>Project plan approval 1.2.4</td>
<td></td>
<td>Perform second survey 1.4.4</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix G: Responsibility/Communication Matrix

<table>
<thead>
<tr>
<th>ID</th>
<th>Communication Vehicle</th>
<th>Target Audience</th>
<th>Description/Purpose</th>
<th>Frequency</th>
<th>Owner</th>
<th>Distribution Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Status reports every two weeks</td>
<td>Faculty at USF</td>
<td>Contact current project status</td>
<td>Bi-weekly</td>
<td>Zahra Asiabar</td>
<td>Email/Zoom</td>
</tr>
<tr>
<td>2</td>
<td>Monthly status report</td>
<td>Medical manager &amp; NP specializing in diabetes</td>
<td>Proposal of project, approval, and report current project status</td>
<td>Monthly</td>
<td>Zahra Asiabar</td>
<td>Email/Zoom</td>
</tr>
<tr>
<td>3</td>
<td>Education and conducting surveys</td>
<td>Health Care Practitioners</td>
<td>Examine project efficacy and applicability</td>
<td>Before &amp; after the education</td>
<td>Zahra Asiabar</td>
<td>Email</td>
</tr>
</tbody>
</table>
# Appendix H: SWOT Analysis

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Existing Educational material for patients in English &amp; Spanish</td>
<td>- Limited patients receive instruction on foot care by HCPs</td>
</tr>
<tr>
<td>- Open to change</td>
<td>- None of patients receive educational materials</td>
</tr>
<tr>
<td>- Existing diabetic foot screening form for HCPs</td>
<td>- Patients were low socioeconomic status</td>
</tr>
<tr>
<td>- Interpreter available</td>
<td></td>
</tr>
<tr>
<td>- Patients feel support &amp; trust medical decisions</td>
<td></td>
</tr>
<tr>
<td>- Collaborative clinic management team</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Improve patient’s diabetic foot self-care skills</td>
<td>- HCPs unwillingness to perform online diabetic foot screening</td>
</tr>
<tr>
<td>- Lower E.R. visit rate</td>
<td>- HCPs time constraint</td>
</tr>
<tr>
<td>- Lower hospitalization rate</td>
<td>- Patient’s reluctance to have foot screening due to a lack of foot hygiene and wearing shoes</td>
</tr>
</tbody>
</table>
## Appendix I: Proposed Budget

<table>
<thead>
<tr>
<th>Cost of Project</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DNP student’s time</td>
<td>$2400</td>
</tr>
<tr>
<td>Participating providers’ time (4 participants)</td>
<td>$410</td>
</tr>
<tr>
<td>Printing Handouts for patient’s education</td>
<td>$1080</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td>$3890</td>
</tr>
<tr>
<td><strong>Return on Investment</strong></td>
<td>At least $5400/year</td>
</tr>
</tbody>
</table>
Appendix J: Kurt Lewin’s Change Theory (Culchais3, 2014)

Kotter’s 8 Step Model of Change (Lynch, 2020)
Appendix K: Proposed CQI Method and Data Collection Tools

Pre-Workshop Survey Form

Thank you for your participation in this pre and post survey.

This survey is part of the outcome evaluation for my DNP project. Participation is voluntary and your participation will help me evaluate the success of the intervention.

Thank you,

Zahra Naderi Asiabar

Choose your title: □ MD □ NP □ PA

1. I am confident to perform screening of diabetic foot ulcers on the distant visits.
   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree

2. I am willing to perform screening of diabetic foot ulcers on the distant visits.
   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree

3. I pass on the foot care teaching handout to diabetic patients on the distant visits.
   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree

   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree
## Post-Workshop Survey Form

Choose your title: □ MD □ NP □ PA

1. As a result of attending this workshop, I would more likely be confident to perform screening of diabetic foot ulcers on the distant visits.
   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree

2. As a result of attending this workshop, I would more likely be willing to perform screening of diabetic foot ulcers on the distant visits.
   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree

3. As a result of attending this workshop, I would more likely pass on the foot care educational brochure to diabetic patients on the distant visits.
   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree

4. As a result of attending this workshop, I would more likely document diabetic foot screening in the athenaNet during distant visits.
   □ Strongly agree □ Agree □ Neutral □ Disagree □ Strongly disagree
Appendix L: Diabetes Foot Screen Form

<table>
<thead>
<tr>
<th>Patient's Name (Last, First, Middle):</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Examiner:</td>
</tr>
</tbody>
</table>

**Sensation:**
- Normal sensation
- Sensation of numbness/tingling/throbbing/burning
- Absent or altered sensation at one or more of the five sites
- Pain
- Callus (fissure/crack w/o bleeding)
- Pre-Ulcer
- Ulcer (blisters, fissure/crack with bleeding, infected/noninfected ulcer, wet gangrene)

**Skin condition:**  R - Redness  C - Cyanosis  S - Swelling  W - Warmth  C - Cool with pallor  D - Dryness  M - Maceration

*Check between toes*

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>History foot ulcer?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal foot shape?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Weakness asks foot? ROM</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Nails thick, long, Ingrown, discoloration?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Are the shoes appropriate in style and fit?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**KEY:**  R (right)  L (left)  B (both)

**RISK CATEGORY:**
- 0  No loss of protective sensation.
- 1  Loss of protective sensation (no weakness, deformity, callus, pre-ulcer or Hx. ulceration)
- 2  Loss of protective sensation with weakness, deformity, pre-ulcer or callus but no Hx. ulceration.
- 3  History of plantar ulceration, neuropathic fracture (Charcot foot) or amputation.
Appendix M: Foot screening questions

Diabetic Foot Screen Questions:

1. Do you feel numbness/tingling/burning in your feet or legs?
2. Do you feel cold and warm sensations?
3. Do you have any redness, swelling, fissure/ulcers on your feet?
4. Do you have a thick, ingrown, or discoloration on your nails?
Appendix N: Foot care brochure in English and Spanish

<table>
<thead>
<tr>
<th>Check your feet every day. If you cannot see the bottom of your feet use a mirror. Make sure to check in between your toes.</th>
<th>Keep the skin soft and smooth. Check the water temperature with your hands before soaking your feet. Make sure to dry in between your toes. Use talcum powder or cornstarch to keep the skin between your toes dry to prevent infection. Rub a thin coat of lotion, cream, or petroleum jelly on the tops and bottoms of your feet. Do not put lotion or cream between your toes because this might cause an infection.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>If you can see, reach, and feel your feet, trim your toenails regularly. Trim your toenails straight across and smooth the corners with an emery board or nail file. This prevents the nails from growing into the skin. Do not cut into the corners of the toenail. Smooth corns and calluses (thick patches of skin) gently. Do not cut corns and calluses. Do not use razor blades, corn plasters, or liquid corn and callus removers-they can damage your skin and cause an infection.</td>
<td>Wear shoes and socks at all times. Do not walk barefoot when indoors or outside. Do not wear sandals, high heels, flip-flops. Check inside your shoes before you put them on. Make sure the lining is smooth and that there are no objects in your shoes. Wear shoes that fit well and protect your feet. Take off shoes in your foot exam appointment day.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
</tbody>
</table>
Keep the blood flowing to your feet.
Put your feet up when you are sitting.
Wiggle your toes for 5 minutes, 2 or 3 times a day.
Move your ankles up and down and in and out to help blood flow in your feet and legs.
Do not cross your legs for long periods of time.
Be active. Move more by walking, dancing, swimming, or going bike riding.
Do not smoke. Smoking can lower the amount of blood flow to your feet.

-Revisa tus pies todos los días. Si no puede ver la parte inferior de sus pies use un espejo. Asegúrese de verificar entre sus dedos de los pies.

-Mantener la piel suave y tersa.
-Verifique la temperatura del agua con las manos antes de remojar sus pies.
-Asegúrese de secarse entre los dedos de los pies.
-Use talco o almidón de maíz para mantener la piel seca entre los dedos de los pies para prevenir infecciones.
-Frote una fina capa de loción, crema o vaselina en la parte superior e inferior de sus pies.
-No coloque loción o crema entre los dedos de los pies porque esto podría causar una infección.
-Si puede ver, alcanzar y sentir sus pies, recorte sus uñas de los pies con regularidad.
-Recorte las uñas de los pies en línea recta y alise las esquinas con una tabla de esmeril o una lima de uñas.
- Esto evita que las uñas crezcan en la piel. No corte en las esquinas de la uña del pie.
-Callos lisos y callos ( parches gruesos de piel) con suavidad.
- No corte los callos y los callos.
- No use cuchillas de afeitar, emplastos de maíz ni removedores de callos o de maíz líquidos, ya que pueden dañar su piel y causar una infección.

-Lleve zapatos y calcetines en todo momento.
-No camine descalzo cuando esté adentro o afuera.
-No uses sandalias, tacones altos, chanclas.
-Revisa dentro de tus zapatos antes de ponerlos.
-Asegúrese de que el forro sea suave y que no haya objetos en sus zapatos.
-Use zapatos que le queden bien y proteja sus pies.
-Quítese los zapatos el día de la cita para el examen de los pies.

-Mantén la sangre fluyendo hacia tus pies.
-Pon los pies en alto cuando estés sentado.
-Mueve los dedos de los pies durante 5 minutos, 2 o 3 veces al día.
-Mueva sus tobillos hacia arriba y hacia abajo y hacia adentro y afuera para ayudar a que la sangre fluya en sus pies y piernas.
-No cruce las piernas durante largos períodos de tiempo.
-Ser activo. Muévase más caminando, bailando, nadando o yendo en bicicleta.
-No fume. Fumar puede disminuir la cantidad de flujo de sangre a sus pies.

Bakhshi, M. (2019). Implementing Foot Care Program in a Rural Clinic. Doctor of Nursing Practice Project, University of San Francisco. University of San Francisco Scholarship Repository.
Appendix O: PowerPoint slides for education providers (Initial)

Introduction

- Diabetes is on increase globally. It is predicted that by 2045, universal prevalence of diabetes will grow to roughly 629 million people (International Diabetes Federation, 2017).
- Diabetic Foot Ulcers (DFUs) continue to be a high risk of amputation and mortality, and late referral contributes to unfavorable outcomes (Armstrong et al., 2007; Morbiachet et al., 2012).
- Primary healthcare providers play a critical role in foot screening and stratification assessments, foot care instruction to patients with diabetes and heightened care (The Royal Australian College of General Practitioners, 2016).

Objectives

- Complete a diabetic foot screen form virtually
- Require patient to email a foot image to clinic if needed
- Educate patient and family on foot care and provide them a brochure
- Referral to podiatrist or wound care clinic if needed
- Document diabetic foot care in athenaNet

Diabetic Foot Screen Form

- This “Diabetic Foot Screen” form is a revised version of the one being used before pandemic in Monterey RoTaCare clinic.
- The form contains a series of questions that will help provider to identify “at risk” foot online.
- Provider’s assessment findings can be further documented in “athenaNet” through use of “feet image”, which allows provider to identify location of abnormalities on foot.

Assessment

- Ask patient if they have ever had (past or present) a foot ulcer or an open area that took a long time to heal.
- Ask about if there is elevated and localized skin temperature by touch (back of hand) and compare it with contralateral foot.
- Ask patient to demonstrate dorsi flexion of ankle and large toe, and plantar flexion, and assess limitation.
- Ask if patient has ankle or foot muscle weakness.

Implementing a Diabetic Foot Care in a Virtual Clinic

Prepared by:
Zehra Nadiri-Akshar
University of San Francisco

Toe Dorsiflexion

Foot Dorsiflexion
Assessment

- Ask if patient is able to do self-inspection of plantar with help of a mirror or a family member.
- Ask if patient uses an appropriate footwear in style and fit without creating foot pressure points.
- Ask if patient has ever had an absent or altered sensation on feet (dorsal and plantar), or feeling tingling, numbness, throbbing, or burning.
- Look at the general shape of foot (bunions, toe deformity, toenails thick or ingrown, mycotic, callus, fissure, swelling, amputation of lower leg, foot, or toe, high arches or flat feet, Charcot foot)

Self-Inspection

Ulcers

Ulnar foot

Bunions

Toenails Ingrown & Discoloration

Callos

Plantar

Management

- Once foot screen form has been completed to the best of provider’s ability, determine the risk category and proceed with the appropriate patient care and education (provide them a foot care brochure), and follow-up recommendations.
- All patients, regardless of category, should be re-screened annually and should be given basic patient education.
Action to be taken

- Disease control
  - Education: Proper shoe fit and design, daily self-inspection, skin/nail care, early reporting of foot injuries
  - Routine follow-up (1-12 weeks, every 1-3 months, every 3-6 months, annually, as needed)

Foot care brochure in English

- Check your feet every day. (If you cannot see the bottoms of your feet use a mirror. Make sure to check between your toes.)
- Keep the blood flowing to your feet.
- Put your feet up when you are sitting.
- Wiggle your toes 5 x minutes, 2 x 3 times a day.
- Move your ankles up and down 3 x and roll to help blood flow to your feet and legs.
- Keep your feet and legs warm.
- Be active. Wear more walking shoes, cycling, swimming, or going roller skating.
- Do not stand barefoot or walk on hot surfaces.
- Do not crack your knuckles to loosen the amount of blood flow to your feet.

Foot care brochure in Spanish

- Revise los pies todos los días. Si no puede ver la parte inferior de sus pies, use un espejo:
- Los pies de los diabéticos pueden dañarse.
- Revise sus pies cada semana.
- Proteja sus pies.
- Mantenga los talones y las puntas de sus pies.
- Diga a su médico si su pie se siente frío, se siente como agua o se daña.
- No deje que su médico intente curar sus pies.
- Los pies de los diabéticos pueden dañarse.

Foot care brochure in English

- If you can see, reach, and tell your feet, in 3 to 12 months:
  - Check your feet every day.
  - Don't smoke.
  - Wash your bare feet every day.

Foot care brochure in English

- Disease control

- Disease control

- Foot care brochure in English

- Disease control

- References


Appendix P: PowerPoint slides for education providers (Modified)

Implementing a Diabetic Foot Care in a Virtual Clinic

Prepared by:
Zehra Naderi/Asab
University of San Francisco

Objectives
At the end of this lesson, you will be able to:
- Ask diabetic foot screening questions virtually
- Require patient to email a foot image to clinic if needed
- Educate patient and family on foot care and provide them an educational brochure
- Referral to podiatrist or wound care clinic if needed
- Document diabetic foot care in athenaNet

Diabetic Foot Screen Questions
1. Do you feel numbness/tingling/burning in your feet or legs?
2. Do you feel cold and warm sensations?
3. Do you have any redness, swelling, fissure/ulcers on your feet?
4. Do you have a thick, ingrown, or discoloration on your nails?

Red flags for referral
- Loss of protective sensation
- Open wounds or signs of infection
- Charcot neuroarthropathy
- Severe foot deformity
- H/O foot ulcers and amputation

Management
- For patients with red flags/symptoms, request photograph (will be uploaded to Athena)
- Determine the risk category
- Proceed with the appropriate patient care
- Provide them a foot care brochure
- Refer them to wound care clinic/podiatrist if needed
- Follow-up recommendations
- Documentation (note in Athena Quality measures)
- All patients, regardless of category, should be screened annually.