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Staff Education to Nurses to Improve Routine Foot Examinations for Diabetic Patients

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Walden University

College of Nursing

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Sarah Abrefi

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Walden University
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Executive Summary: Staff Education Project

Staff Education to Nurses to Improve Routine Foot Examinations for Diabetic Patients

by

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Summary

This project was a practice-focused quality improvement initiative that implemented a structured staff education intervention to improve nurses' competency in performing comprehensive diabetic foot examinations within an outpatient diabetes clinic. The practice problem addressed was the inconsistent and inadequate implementation of routine foot assessments. The project was guided by the question: For nurses in an outpatient diabetes clinic, does a structured educational program on diabetic foot assessment improve nurses' knowledge and skill competency as measured by pre- and post-testing and return demonstrations? A pretest–posttest evaluative design was used, with descriptive analysis of mean scores to assess effectiveness.

Ten registered nurses completed the intervention, and results demonstrated an increase in mean knowledge scores from 68% pre-intervention to 88% post-intervention, reflecting a normalized learning gain of 66% which indicated a meaningful improvement in knowledge and perceived confidence in assessment practices. Key products of the project included the development of a standardized educational module, the use of evidence-based assessment frameworks, and the validation of competency through return demonstrations. The findings support the conclusion that structured staff education is a feasible and effective strategy for strengthening preventive nursing practice, standardizing care delivery, and improving early identification of high-risk patients. Broader implications include advancing nursing practice through improved quality and

consistency of care, promoting patient safety, and supporting positive social change by helping to reduce disparities in diabetes-related outcomes.

Background

Diabetes mellitus is a chronic, progressive condition that affects millions of individuals worldwide and is associated with significant long-term complications (American Diabetes Association [ADA], 2024). Among the most serious and costly of these complications are diabetes-related foot ulcers, which remain a leading cause of morbidity, functional impairment, reduced quality of life, and nontraumatic lower-extremity amputations (Armstrong et al., 2023). The development of diabetic foot ulcers is multifactorial, most commonly resulting from the combined effects of peripheral neuropathy, peripheral arterial disease, biomechanical abnormalities, and repetitive or unrecognized trauma (Bus et al., 2023). Loss of protective sensation due to neuropathy often prevents patients from detecting early signs of injury, while vascular impairment delays wound healing and increases the risk of infection.

Patients who develop foot ulcers experience higher rates of hospitalization, prolonged treatment courses, recurrent infections, and increased mortality compared to individuals with diabetes who do not develop ulcers. Managing diabetic foot complications requires substantial resources, including frequent clinic visits, advanced wound care therapies, surgical interventions, and long-term rehabilitation services (Da Ros et al., 2024

Diabetic foot ulcers frequently result in complications, including lower extremity amputations. Lower-extremity amputations not only represent a major adverse health outcome but are also associated with loss of independence, psychological distress, and increased healthcare costs (Armstrong et al., 2023). Given these consequences,

preventing foot ulcers is widely recognized as a critical priority in diabetes care. (ADA,2024)

Routine, comprehensive foot examinations are a cornerstone of preventive diabetes management. (ADA, 2024). Systematic foot assessment and patient education are associated with a reduced risk of ulceration and amputation (Armstrong et al., 2023). Early detection enables prompt interventions and intensified monitoring for high-risk individuals (Bus et al., 2023).

Despite the compelling evidence base supporting routine diabetic foot examinations, gaps in implementation remain common in clinical practice. Internal organizational assessments within the outpatient clinic identified inconsistent completion of comprehensive foot exams, variability in assessment techniques, and differences in nursing confidence and skill related to diabetic foot evaluation. Documentation practices were also found to be inconsistent, limiting continuity of care and the ability to track changes in patient risk status over time. These findings suggest that although foot assessments are recognized as important, they are not consistently or systematically performed, increasing the risk that early warning signs of foot complications may be missed.

Variation in nursing skill levels and assessment practices is a particularly important concern, as nurses play a vital role in chronic disease management and patient education in outpatient settings. Inconsistent training, lack of standardized assessment tools, time constraints, and competing clinical priorities may all contribute to incomplete or superficial foot examinations. (Björk et al.,2022). Without a shared, evidence-based

assessment framework, clinicians may focus on visible skin breakdown while overlooking critical components such as sensory testing and vascular evaluation (ADA, 2024). This inconsistency undermines the effectiveness of preventive strategies and may delay the identification of patients at high risk of ulceration and amputation (Armstrong et al., 2023).

Bus et al. (2023) wrote that Routine foot assessments emphasize the need for regular evaluations. These assessments typically include inspection of the skin and nails, evaluation of foot structure and deformities, assessment of peripheral pulses, sensory testing using validated methods, and clear, standardized documentation of findings (ADA, 2024).

Considering the significant burden of diabetic foot complications, the demonstrated effectiveness of routine foot assessments, and the identified gaps in current practice, there is a need for a focused, evidence-based intervention within the outpatient clinic. Addressing variability in assessment practices through structured education and standardized protocols can improve early identification of risk, enhance preventive care, and ultimately reduce the incidence of foot ulcers and lower-extremity amputations (Armstrong et al., 2023). Strengthening nursing competence in diabetic foot assessment aligns with best practice recommendations and supports improved patient outcomes, safety, and quality of care (ADA, 2024).

This project was developed to answer the clinical question: For nurses in an outpatient diabetes clinic, does implementing a structured educational program on

diabetic foot assessment improve nurses' knowledge and skill competency, as measured by pre- and post-tests and return demonstrations? The goal was to enhance nurses' knowledge of the importance of foot examinations in diabetic patients and improve their ability to perform comprehensive assessments. Armstrong et al (2023) demonstrated that structured education improves detection and understanding of diabetic foot disease risk.

Staff Education Project Development

This project targeted registered nurses and licensed practical nurses who manage chronic diseases in an outpatient diabetes clinic. These nursing staff members play a vital role in monitoring routine diabetes care, providing patient education, and early identification of complications, positioning them as key stakeholders in preventing diabetes-related foot ulcers. Given their frequent patient contact and responsibility for comprehensive assessments, enhancing nursing competency in diabetic foot evaluation was identified as a critical strategy to address gaps in preventive care (Armstrong et al., 2023).

The educational intervention was designed to enhance nursing knowledge, skills, and confidence in comprehensive diabetic foot assessments. The educational module was developed using the organization's existing training infrastructure and aligned with current evidence-based clinical guidelines for diabetes foot care. Leveraging existing materials supports sustainability, minimizes additional costs, and ensures consistency with organizational policies and standards of practice.

Educational content focused on both foundational knowledge and practical application. Nurses were instructed on the identification of key clinical risk factors for

diabetic foot complications, including peripheral neuropathy, peripheral arterial disease, foot deformities, previous ulceration or amputation, poor glycemic control, and inappropriate footwear. Emphasis was placed on understanding how these factors interact to increase ulcer risk and how early identification can guide preventive interventions

The module provided a step-by-step framework for conducting comprehensive diabetic foot assessments. Instruction included systematic inspection, vascular assessment, sensory testing using standardized techniques, and recognition of early warning signs and red flags. Referral pathways, competency evaluation through return demonstrations, and data analysis methods were consistently incorporated in accordance with best practices in nursing education and quality improvement.

Results

The purpose of this project was to evaluate the effectiveness of a structured educational intervention on nurses' knowledge related to comprehensive diabetic foot assessment in an outpatient diabetes clinic. A pretest–posttest design was used to measure changes in knowledge following completion of the educational session. Participants included 10 registered nurses who completed both the pre-intervention and post-intervention assessments.

A standardized knowledge questionnaire was administered immediately before the educational session and re-administered after the session to objectively measure knowledge acquisition. Analysis of the aggregate scores demonstrated improvement in overall knowledge following the intervention. The mean pretest score was 68%, while the mean posttest score increased to 88%, reflecting a 20-point improvement in knowledge.

Normalized learning gain was used to evaluate changes in nursing learners' knowledge while controlling baseline differences in pretest scores. This approach allows for meaningful comparison of instructional effectiveness across learners with varying levels of prior knowledge and has been widely applied in health professions education research. Normalized learning gain was calculated using the following formula (Hake, 1998):

$$g = \frac{\text{Posttest score} - \text{Pretest score}}{\text{Maximum possible score} - \text{Pretest score}}$$

Table 1 presents a comparison of pretest and posttest mean scores and normalized learning gain.

Table 1

Statistical Analysis of Pre- and Posttest Results

Participant number	Pre-test score	Post-test score	Normalized learning gain
1	0.60	0.85	62.50
2	0.65	0.90	71.43
3	0.70	0.88	60.00
4	0.62	0.84	57.89
5	0.75	0.92	68.00
6	0.68	0.89	65.63
7	0.72	0.94	78.57
8	0.66	0.87	61.76
9	0.70	0.90	66.67

10	0.74	0.93	73.08
Mean score	0.682	0.892	66.65

Organizational Impact

The project had a positive impact on the outpatient diabetes clinic by addressing variability in nursing assessment practices and promoting standardization of care. Improved nursing competency supports earlier identification of patients at risk for diabetic foot complications, thereby facilitating timely referrals and preventive interventions. Standardized assessment practices also enhance documentation consistency, thereby improving communication among healthcare team members and supporting continuity of care.

From an organizational perspective, strengthening preventive assessment practices aligns with quality improvement and patient safety priorities. Improved assessment reliability has the potential to reduce preventable complications, hospitalizations, and associated healthcare costs over time. The use of the organization's existing training infrastructure supported feasibility and sustainability, enabling the integration of educational content into routine onboarding and ongoing professional development activities.

Limitations

Several limitations affected the interpretation of this project's results. First, the project used a pre–post design without a control group, limiting the ability to attribute observed improvements solely to the educational intervention. Second, the sample was

limited to nursing staff at a single outpatient diabetes clinic, which may limit generalizability to other settings. Third, outcomes focused on short-term measures of knowledge and skill competency rather than long-term retention or patient-centered outcomes such as ulcer rates or amputations. Time constraints within the clinical environment also limited opportunities for extended follow-up evaluation.

Significance Beyond the Local Site

Although this project was implemented in a single outpatient clinic, its significance extends beyond the local site. The findings demonstrate that structured nursing education is a feasible and effective strategy for improving adherence to evidence-based diabetic foot assessment practices. The project provides a replicable model that can be adapted to other outpatient clinics and healthcare organizations seeking to strengthen preventive diabetes care. By emphasizing standardized education, competency validation, and integration into existing workflows, the intervention supports broader efforts to reduce practice variability, improve patient safety, and promote health equity.

Conclusions

This project demonstrates that structured staff education is an effective and feasible strategy for improving nursing knowledge and skill competency in diabetic foot assessment within outpatient settings. The observed improvement in mean knowledge scores from 68% to 88%, along with a normalized learning gain improvement of 66%, provides measurable evidence that targeted education can meaningfully strengthen nurses' understanding of evidence-based assessment practices. Over time, improved

assessment practices have the potential to reduce preventable complications such as foot ulceration, infection, hospitalization, and lower-extremity amputation.

Several recommendations emerge from this project's findings. First, the educational module should be integrated into routine onboarding for new nurses and included in annual competency validation to support sustained practice change. Second, the use of standardized diabetic foot assessment tools and documentation templates could further strengthen consistency and improve continuity of care. Third, future quality improvement initiatives should consider evaluating long-term outcomes, such as documentation compliance, referral patterns, and patient-level indicators, to better understand the sustained impact of education on clinical practice and outcomes.

Implications for Practice

The implications for nursing practice are significant. By translating existing evidence into standardized clinical practice, this project strengthens preventive care, supports safer clinical decision-making, and reinforces the essential role of nurses in chronic disease management.

The project also supports positive social change and advances diversity, equity, and inclusion. Diabetes-related complications disproportionately affect individuals from underserved and marginalized populations who often experience barriers to preventive care. By promoting consistent, high-quality assessments for all patients, this intervention supports more equitable risk identification and earlier intervention across diverse patient populations. Strengthening nursing practice in this way helps reduce disparities in

diabetes outcomes and supports the broader goal of equitable, patient-centered care for individuals living with chronic disease.

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