DIABETES FOOT EDUCATION; AN EVIDENCE-BASED APPROACH IN LONG-TERM CARE

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- I have no financial disclosures
Objectives

- Review the scope of foot problems and their consequences in people with diabetes
- Understand the need for interprofessional roles for foot care as suggested by practice guidelines
- Present protocol and results from the NSUCOM GEC Evidence-Based study on Diabetes Foot Education in the Long-term Care Setting
  - Change in knowledge level and practice before and after training
  - Determine the differences in patient outcomes through chart reviews before and after the training
- Examine the implications for practice
65 years and above - 10.9 million/26.9 percent, have diabetes (CDC 2014)

15-25% will develop ulcers on their feet (Up to 50% of DPN may be asymptomatic, and patients are at risk for insensate injury to their feet)

20% of those with diabetes admitted to hospitals because of foot problems

5 year survival rate ~50% for BKA (O’Brian, 1997)

Nearly $245 billion spent annually for direct and indirect medical costs (CDC 2014)

Average cost of treatment of diabetic ulcer $28,000 (Boulton et al. NEJM 2004)
Neuroischemic ulcers
ADA Recommendations for Foot Care 2015

◆ For all patients with diabetes, perform an annual comprehensive foot examination to identify risk factors predictive of ulcers and amputations. The foot examination should include inspection and assessment of foot pulses. B

◆ Patients with insensate feet, foot deformities, and ulcers should have their feet examined at every visit. E

◆ Provide general foot self-care education to all patients with diabetes. B

◆ A multidisciplinary approach is recommended for individuals with foot ulcers and high-risk feet (e.g., dialysis patients and those with Charcot foot, prior ulcers, or amputation). B

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ADA Recommendations for Foot Care 2015

- Refer patients who smoke or who have a loss of protective sensation (LOPS), structural abnormalities, or a history of prior lower-extremity complications to foot care specialists for ongoing preventive care and lifelong surveillance. C

- Initial screening for peripheral arterial disease (PAD) should include a history for claudication and an assessment of the pedal pulses. C

- Refer patients with significant claudication or a positive ankle-brachial index (ABI) for further vascular assessment and consider exercise, medications, and surgical options. C

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Research Question

Will the use of an interprofessional evidence-based training improve the knowledge of health care professionals to conduct patient foot exams and to provide patient education on foot care for geriatric patients with diabetes?
Hypotheses

- **Hypothesis 1**: Long term care health care professionals who participate in an interprofessional, evidence based practice program on diabetes foot care will have **improved knowledge** on conducting foot exams including foot inspection, pedal pulses, foot care, and patient education.

- **Hypothesis 2**: Patient foot evaluation measured through chart reviews for foot inspection, pedal pulses, foot care, and patient education will improve in frequency following an interprofessional evidence based practice program on diabetes foot care in a long term care facilite (i.e. practice change)
Site and Sample

- **Site**: 3 nursing homes in S. Florida
- **Sample**: 103 patients with diabetes stratified by dementia diagnosis

**Inclusion criteria for chart review**: Geriatric patients over 65 diagnosed with T2DM

**Exclusion criteria for chart review**: bilateral below knee amputations

**Inclusion criteria for foot care training**: RN’s, LPN’s, pharmacists, residents, and physical therapists
**Design: Pretest-Posttest**

- Participants received a pre-test of knowledge on diabetic foot care and patient education prior to receiving any training or intervention.

- Diabetes Foot Education Training Module (45 min) by the investigators (live and video recording for night shifts).

- Participants were prompted to conduct and document a foot exam on a regular basis and make appropriate referrals for complications.

- Post-test after 3 months on knowledge and practice.
Measures

- Knowledge Questionnaire
  - A Likert scale survey to test the knowledge
  - Developed based on the evaluation tools used in published work of research studies on diabetic foot care.

- Chart Tool
  - To assess the medical history of the patients
  - To assess foot complications and referrals for special care

- Feedback Form: A self developed form was used to obtain the feedback of the participants to assess the impact of the foot care training
Training Content

- Teach basic assessment skills on conducting a foot exam
  - Identification of feet at risk
  - Physical assessment of feet at risk
    - Visual inspection
    - Assessment of pulses
    - Sensory exam (touch, vibration, monofilament)
  - When to refer and to whom- referral pathways
  - Demonstration and testing of tools
  - Debridement/nail cutting
  - Preventive foot wear
  - History taking and record keeping
Monofilament and Tuning Fork for sensory Testing
Residents of nursing homes are at high risk of developing foot problems due to multiple comorbidities, macro- and microvascular disease, limited caregiver support, and cognitive impairment.

Almost 70% of the total patient population had foot problems, ranging from dry red skin to amputation.

38% of patients with concomitant dementia had significant foot problems, including calluses, edema, and amputations.

The authors found that the assessment of foot problems and follow-up treatment was inconsistently documented in patient charts.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Site 1</th>
<th>Site 2</th>
<th>Site 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients, n</td>
<td>25</td>
<td>56</td>
<td>22</td>
</tr>
<tr>
<td>Mean age, years</td>
<td>83</td>
<td>76</td>
<td>75</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2 (8)</td>
<td>40 (73)</td>
<td>11 (50)</td>
</tr>
<tr>
<td>Male</td>
<td>23 (92)</td>
<td>16 (23)</td>
<td>9 (41)</td>
</tr>
<tr>
<td>Not Reported</td>
<td>–</td>
<td>–</td>
<td>2 (9)</td>
</tr>
<tr>
<td>Ethnicity, n (%)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>24 (96)</td>
<td>17 (30)</td>
<td>9 (41)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>–</td>
<td>5 (9)</td>
<td>–</td>
</tr>
<tr>
<td>Black</td>
<td>1 (4)</td>
<td>26 (47)</td>
<td>8 (36)</td>
</tr>
<tr>
<td>Other</td>
<td>–</td>
<td>8 (14)</td>
<td>5 (23)</td>
</tr>
<tr>
<td>Dementia, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (60)</td>
<td>32 (57)</td>
<td>13 (59)</td>
</tr>
<tr>
<td>No</td>
<td>10 (40)</td>
<td>24 (43)</td>
<td>9 (41)</td>
</tr>
<tr>
<td></td>
<td>Dementia, n (%)</td>
<td>No Dementia, n (%)</td>
<td>Total, n (%)</td>
</tr>
<tr>
<td>--------------------------</td>
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</tr>
<tr>
<td>Total Patients</td>
<td>60 (58)</td>
<td>43 (42)</td>
<td>103 (100)</td>
</tr>
<tr>
<td>No Foot Problems</td>
<td>18 (30)</td>
<td>14 (32)</td>
<td>31 (31)</td>
</tr>
<tr>
<td>Foot Problems(^a)</td>
<td>42 (70)</td>
<td>29 (67)</td>
<td>71 (69)</td>
</tr>
<tr>
<td>Edema</td>
<td>14 (33)</td>
<td>9 (31)</td>
<td>23 (32)</td>
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<tr>
<td>Amputations</td>
<td>3 (7)</td>
<td>1 (3)</td>
<td>4 (6)</td>
</tr>
<tr>
<td>Ulcers</td>
<td>6 (14)</td>
<td>14 (48)</td>
<td>20 (28)</td>
</tr>
<tr>
<td>Calluses</td>
<td>5 (12)</td>
<td>2 (6)</td>
<td>7 (10)</td>
</tr>
<tr>
<td>Other(^b)</td>
<td>14 (33)</td>
<td>3 (10)</td>
<td>17 (24)</td>
</tr>
</tbody>
</table>

\(^a\)Patients had multiple foot problems.

\(^b\)This included dryness, red and scaly skin, painful nails.
Change in Knowledge by LTC Facility

- Results from the LTC 1 and LTC 3 groups did not show any significant effect in increase in knowledge after the completion of the EBP.

- The scores at LTC 1 changed from a pre-test mean of 20.10 (standard deviation [SD], 1.05) to a post-test mean of 19.40 (SD, 1.13).

- The scores at LTC 3 changes from a pre-test mean of 17.4 (SD, 1.4) to a post-test mean of 16.9 (SD, 2.10).

- The results from LTC 2, however, indicated a significant difference in the scores for pre-test (mean score, 11.94; SD, 1.7) and post-test (mean score, 19; SD, 1.4) knowledge (P<.05).

Clinical Practice Change

- Chart reviews completed 3 months before and 3 months after the training indicated a clinically and statistically significant practice change in all three facilities.

- Only 8% of patient charts included documentation of foot assessments prior to the training, compared with 38% after the training (P=.001)

- On average, there was a 30% change in quality of documentation after the trainings

Diabetic Shoes
Non-Diabetic Shoes
Appropriate and timely referrals

- Podiatry
- Diabetic shoe suppliers
- Wound care
- Vascular evaluation
- Vascular surgery
- Endocrinology
- Infectious disease
Limitations

- Convenience sampling
- Staff turnover high in LTC
- Sample not randomly drawn
- Limited generalizability (there are differences in foot knowledge and practice across LTC facilities)
Implications for Practice

- Incomplete documentation of foot assessments can pose a significant risk to residents, especially because a history of foot problems is an important factor for determining the risk of future foot problems.

- The training program may promote awareness that can:
  - Increase the likelihood of early detection of wounds
  - Appropriate and timely referrals
  - Patient education
  - And prevention of foot amputations.
THANK YOU!