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Purpose: The purpose of this study was to determine the effectiveness of a patient-centered diabetes foot education intervention in a rural clinic, designed to improve patients’ knowledge, as evidenced by an increase in the Patient Interpretation of Neuropathy (PIN) scores from pre-intervention to post-intervention.

Methods: The participants were clinically diagnosed with type 2 diabetes for at least six months and were less than 70 years of age. Patients were excluded if they were more than 70 years of age, had active foot ulcers, with previous minor or major amputations, or Charcot's joints. The Patient Interpretation of Neuropathy (PIN) questionnaire was used. It is a 73-item reliable and valid measurement tool that evaluated type 2 diabetic patients’ level of understanding of the link between foot ulceration, self-care deficit, cognitive and emotional understanding of peripheral neuropathy. A single group pretest-posttest quasi-experimental design was used with paired samples t-test which compared mean scores for the same group of participants in two different occasions. To estimate the sample size, a priori, G*Power was used to determine the appropriate number of participants needed to detect a difference between pre and posttest PIN total scores with 95% confidence that the difference was real. Estimated sample size needed for power was N=34. A total of 25 participants completed the education intervention with (n=25) pre-test and (n=25) post-test.

Results: There was a significant increase on T2DM patient’s knowledge scores from Pre-educational intervention (M = 261.64, SD = 30.0) to Post educational intervention (M = 327.96, SD = 22.0), t value = 7.952, p = .000 (two-tailed). The Mean difference of the two scores was -66.32, with a 95 percent confidence interval stretching from a lower bound of -83.53334 to an upper bound of -49.10666. The eta squared statistic (.7) indicated an extremely large effect size. Majority of the participants were women which may have increased the probability of female to male ratio. The hypothesis and question posed in this study were both answered YES. The use of the HPM theoretical framework and the selected educational material demonstrated significant changes in knowledge and behavior as evidenced by the statistically significant improvement in diabetic patients’ PIN scores from pre to post implementation of diabetic foot care education intervention.

Conclusion: The use of a scientific approach, such as evidence-based practice, plays a crucial role in the provision of appropriate care to patients. The move towards evidenced based practice paves the way for healthcare professionals to move away from long-established style of care delivery to the new paradigm where decisions are driven according to the best evidence available. The hypothesis and question posed in this study were both answered yes. The use of Pender’s health promotion model as theoretical framework and the selected standardized educational materials demonstrated significant changes in the knowledge and behavior of the participants in this study as evidenced by improvement in diabetic patients’ PIN scores from pre to post implementation of a diabetic foot care prevention education. The findings indicated increased knowledge, willingness and motivation, which are important elements that contribute to behavior change in this patient population. Diabetic foot education and prevention among diabetic patients in this rural clinic is essential because the knowledge and skills acquired as a result of the education intervention will have a significant impact in therapeutic outcomes among this patient population.

Title:
Happy Feet in Tomagwa: A Diabetic Foot Education Intervention
Keywords:
Diabetic Foot Ulcer, Peripheral Neuropathy and Type 2 Diabetes Mellitus

References:


Kim, M., & Mallory, C. (2013). *Statistics for Evidence-Based Practice in Nursing*  


Wilson, B., & Lawrence, J. (2013). Implementation of a foot assessment program in a regional
satellite hemodialysis setting. CANNT Journal, 23(2), 41-47.


Yuncken, J. (2014). Barriers to implementing change within diabetes care. Wound Practice & Research, 22(1)

Abstract Summary:
The complexity of Diabetes requires a multidisciplinary approach which may not be available in many rural health care settings. Fragmented diabetic patient education and under usage of standards of diabetic foot care among disparate populations can be addressed by implementation of a standardized evidenced based diabetic foot education intervention.

Content Outline:
INTRODUCTION & PROBLEM STATEMENT:

- Pandemic level: 1.4 million adults each year.
- Prevalence: 29.1 million or 9.3% of the U.S. population.
- 40%-70% of foot amputations are associated to Diabetes.
- Under usage of diabetes standards of care
- Lack of access to multidisciplinary care
- Fragmented and inconsistent diabetic patient education

BACKGROUND:

- Approximately 2.2 million Texans are diagnosed
  - Projected 8 million by 2040.
- Elderly and Hispanics - fastest growing populations in Texas
  - High risk
  - Disparate population
  - Rural communities
- Costs of Diabetes in Texas > $18.5 billion
  - $12.3 billion in direct medical costs
  - $ 7.4 billion to Medicaid and Medicare
  - $ 4.9 billion to the Private Sector & Other
  - $6.2 billion in indirect costs
- Work absenteeism
- Reduced productivity
- Premature mortality

SIGNIFICANCE

- Foot care programs reduce incidence of foot ulcers and amputations by 45% to 85%
- Increasing incidence of diabetes in this clinic
- Lack of standard diabetic foot assessment and education in this clinic

PURPOSE

- To determine the effectiveness of a patient-centered diabetes foot education intervention designed to improve patients’ knowledge of foot care, as evidenced by an increase in the Patient Interpretation of Neuropathy (PIN) scores from pre-to-post intervention.

HYPOTHESIS/QUESTION

- Hypothesis: There would be a statistically significant difference in diabetic patients’ PIN scores from pre to post implementation of a nurse-focused diabetic foot care educational intervention.
- Question: Was a patient-focused diabetic foot care education intervention more effective than standard care in improving knowledge of foot self-care among T2DM patients in a rural clinic?

THEORETICAL FRAMEWORK

- Pender’s Health Promotion Model

SCOPE AND LIMITATIONS

- Sample: Diabetic patients from disparate population in a rural clinic.
- Funding: None
- Results: Generalized to one geographical area and targeted only type 2 diabetic patients
- Time allotment: 1.5 hours
- Subject to test-retest bias as post-questionnaire was administered three weeks after the education activity.

LITERATURE REVIEW

- Three recurrent themes
  - Self-management
  - Education and prevention
  - Early detection of at risk patients
- Exclusion of foot care education in rural clinics
- Quality improvement (QI) in diabetes care in rural settings is still substandard
- Better understanding of Diabetes is needed.

PROJECT DESIGN

- Quasi-experimental
  - Intervention controlled by investigator
  - Nonrandomization to groups
- Equivalent sample (matched pairs)
SAMPLING METHODS

- Nonprobability sample
- Inclusion criteria: diagnosed with T2DM for six months
- Exclusion criteria:
  - >70 years of age, with neurological diseases except those with diabetic neuropathy).
  - With active foot ulcers, previous minor or major amputations, presence of Charcot’s joints.
- Estimated sample size needed for power was $N=34$; actual sample size $N=25$
- Post hoc Power Analysis = 80.5% power due to large effect.

INSTRUMENT

- Patient Interpretation of Neuropathy (PIN) questionnaire:
  - Measured level of understanding between foot ulceration and self-care deficit.
  - Evaluated cognitive and emotional understanding of diabetic peripheral neuropathy.
- Reliability:
  - Cronbach’s alpha = 0.62-0.90
  - test-retest reliability or Pearson’s $r = 0.51-0.64$

DATA ANALYSIS

- Descriptive statistics:
  - Demographics
  - PIN Item-level Responses
- Inferential statistics
  - Paired Samples T-test: compared Pre/Post responses from PIN
  - Eta Squared for effect size

RESULTS Paired Samples t Test: $t(25) = 7.952, p = .000$ (two-tailed), $\eta^2 = .72$

- Significant increase on T2DM patient's knowledge scores
  - Pre-educational intervention ($M = 261.64, SD = 30.0$)
  - Post-educational intervention ($M = 327.96, SD = 22.0$)
  - $t$ value = 7.952, $p = .000$ (two-tailed)
  - Mean difference = -66.32
  - With a 95% interval from -83.53334 to -49.10666
- All subscales demonstrated a significant difference at the $p=.05$ alpha, which means 95% confidence the results were real and not due to chance.
- ETA Squared Effect size
  - Calculated effect size is 0.7
  - Large effect size based on Cohen’s guidelines for $\eta^2$
    - 01 = small effect
    - 06 = medium effect
    - 14 = large effect

CONCLUSION

Diabetic foot education and prevention among diabetic patients in this rural clinic is essential because the knowledge and skills they have acquired as a result of the education intervention have a significant impact in therapeutic outcomes. The findings in post education indicated increased knowledge, willingness and motivation, which are important elements that contribute to behavior change on this patient population.
IMPLICATIONS

• Dissemination of EBP
• Organizational support
• Development of new knowledge
• Presentation of clinical solution

SUMMARY

• The role of DNP in dissemination of EBP
• Meeting diabetic patients’ needs in a rural clinic
• Incorporation of standard diabetic foot education in routine care
• Implications to nurse leaders
• Future research

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Professional Experience: 2016 to present: Professor, Capella University, Minneapolis, Minnesota. 2007 to present: Professor, Lonestar College North Harris, Houston, Texas. 2001 to 2011: Critical Care Nurse, Michael E. DeBakey VA Medical Center, Houston, Texas. 1995 to 2001: Critical Care Nurse, University of Texas MD Anderson Cancer Center, Houston, Texas. 1992 to 1995: Critical Care Nurse, University of Illinois at Chicago Medical Center, Chicago, Illinois.

Author Summary: Started nursing career in 1980, earned dual Master degrees in Nursing and Business Administration in 2006 and DNP in Educational Leadership in 2015. Accrued thirty years extensive experience in critical care nursing. Joined nursing academia in 2007 at Lone Star College–North Harris. Last year, joined Capella University as adjunct faculty teaching in the MSN program. A great story teller and vignettes of a rich nursing career bring depth to classroom lectures.