

Diabetes Nurse Educators' Prioritized Elder Foot Care Behaviors



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Purpose

The purpose of this study was to identify diabetes nurse educators' perceptions of the most important foot care behaviors for elderly people to enact in daily care.

Methods

A structured, open-ended questionnaire was mailed to a regionally stratified random sample of 90 diabetes nurse educators. Subjects were asked to identify and rank order 8 foot care behaviors perceived important for elderly people with diabetes to enact daily. Data were transcribed and coded into categories and domains using descriptive content analysis.

Results

Forty-seven diabetes nurse educators responded with a total of 346 foot care behaviors perceived important for elders. Twenty-one major foot care behavior content categories were grouped into 4 domains of descending importance: foot/nail care, footwear/shoes, general health, and foot emergencies.

Conclusions

Diabetes nurse educators generated a range of baseline data for developing a reliable, valid, and patient foot care knowledge outcome measure to support national diabetes patient education and self-management program guidelines.

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Peripheral sensory neuropathy, peripheral vascular disease, and foot infections lead to diabetic foot ulcers, the most common complication of diabetes and the one most often leading to lower extremity amputation.^{1,3} The rapidly growing number of older adults with diabetes are particularly at risk for foot ulcers⁴; almost 12% of adults with diabetes have a history of foot ulcers.⁵

About 34% of the diabetes population is age 60 years and older.⁶ Among adults aged 65 to 74 years, 21.6% are currently diagnosed with diabetes, with approximately 20 million projected to be diagnosed by 2050.⁷ In response to these trends, Healthy People 2010 set the goal for older adults with diabetes to increase their active participation in diabetes education and preventive care.⁸ Despite their risk for lower extremity amputation, morbidity, and disability particularly associated with ulcer and wound history,⁹ older adult's active participation in annual preventive foot care measures steadily declined from 73% in 1999 to 69% in 2001.¹⁰

Critical factors recommended for prevention and early detection of foot ulcers to avoid amputation and disability include annual foot examinations, environmental safety, and patient education.¹¹⁻¹³ Comprehensive diabetes patient education to impart fundamental, self-care knowledge is a requisite to help patients optimize their glycemic control and prevent diabetes complications.^{14,15} Measuring patient foot care knowledge is especially important. Patients participating in diabetes education classes have reported foot care information as the least clearly understood topic.¹⁶ Although patients identified foot care information as a topic they required, patient foot care education is the least frequent health care service provided to patients in primary care settings.¹⁷

Diabetes Patient Foot Care Knowledge

The American Association of Diabetes Educators (AADE) Standards of Practice for Diabetes Educators identifies foot care knowledge as an outcome of the patient teaching process derived from patient assessment, planning, and evaluation.¹⁸ In addition, accurate documentation of teaching-learning outcomes is desig-

nated as a strategy for both monitoring and reporting patient status as well as for research purposes.

Accordingly, in 2000, AADE produced the National Diabetes Education Outcomes System (NDEOS), a 3-level individual, program, and national integrative, interdisciplinary diabetes care system for diabetes self-management education to improve the health and quality of life for persons living with diabetes.¹⁹ The foundation of NDEOS is the individual level centered on patient health-related behavior change and is regarded as the "unique and measurable outcomes of diabetes education"^{19(p549)}; accordingly, the patient serves as a basis of the diabetes self-management system.²⁰ In addition, for assessment and documentation purposes, diabetes educators are dependent on reliable and valid measures of the immediate, intermediate, and long-term outcomes of patient education.

NDEOS behavior outcome measures are based on patient self-management behavior changes derived from the provider's reliable assessment of the patient's knowledge, skills, and confidence to enact any 1 or more of 7 behavior changes deemed a priority by the patient. These behavior areas include patient foot care behaviors located in the domain of risk-reduction activities, with the patient's lack of foot care knowledge serving as an indicator of a barrier or threat to success to the enactment of self-foot care behaviors. However, the need for foot care risk-reduction behaviors largely centers on reliable patient self-reported information. There are limitations, however, in determining whether such factors as lack of knowledge account for adverse patient behavior outcomes.²¹ As a result, and for consistency with the NDEOS, reliable and valid measures of patient knowledge are required.

Assessment of diabetes education and patient learning in the NDEOS incorporates the National Standards for Diabetes Self-management Education (DSME) of the American Diabetes Association (ADA) as a critical factor within the framework of NDEOS.²² DSME standards provide interdisciplinary health care providers guidance with 10 strategic structure, process, and outcomes for patient self-management education interventions and programs aimed toward quality health care outcomes. The standards of structure center on the goals and objectives of an organization to assess and meet the diabetes education needs of the patient/population, whereas the standards of process and outcomes focus on evaluating

organizational systematic assessment of diabetes patient knowledge and learning needs to design and provide effective patient-provider teaching interventions aimed to optimize patient outcomes. DSME includes the use of criterion-based diabetes patient education curricula that incorporate NDEOS patient behavioral objectives and outcomes such as patient foot care risk-reduction activities and outcomes aimed toward prevention and treatment of long-term diabetes complications.

In addition to patient knowledge, the patient's attitudes and beliefs were extensively explored in clinical research studies to establish the structure, process, and outcomes of the individual, program, and national levels of the NDEOS and DSME practice and program standards. One of 5 recommendations derived from the ADA includes outcomes research to determine the efficacy of diabetes patient education intervention programs.²³ In accordance with diabetes foot care guidelines, assessment of patient foot care knowledge and foot care behavior at first contact with the patient is highly recommended for prevention and management of diabetes lower extremity complications.²⁴ This supports exploring patient education outcomes for preventive foot care behavior programs, particularly outcome measures sensitive to attributes of the patient such as patient age. For elders, poor cognitive performance and impairment are reported risk factors affecting functional status and activities of daily living of older adults with diabetes that have implications in determining their management of daily self-care for prevention and treatment of diabetes foot care.²⁵ Hence, both qualitative and quantitative research methods are feasible for continuous, ongoing data assessment and analysis to determine the efficacy of health care provider and system intervention outcomes to affect patient knowledge for diabetes self-management such as daily foot care for elders.

Diabetes Patient Foot Care Knowledge Research

Determining the efficacy of patient education and clinical intervention strategic programs is dependent on accurate, reliable, and valid assessment of patient knowledge.²⁶ Yet only a very limited number of research articles describe development of either diabetes patient foot care knowledge instruments or more general diabetes knowledge instruments including 1 or more foot care knowledge items, particularly those that include elderly

subjects. For example, several articles report the design of a foot care knowledge test or design of a test that included a foot care knowledge item(s) yet lack description of testing the instrument's reliability and validity.^{27,28} In addition, these versions of the instruments, or modification of them, were included in other studies to explore patient foot care knowledge or its effect on patient foot care behavior, though with limited psychometric testing for application to the current study.^{29,30} In other cases, a foot care knowledge test may be reported reliable and valid yet with no description of its psychometric properties.³¹ A number of studies indicated diabetes education intervention included foot care knowledge; however, neither the form of foot care knowledge measurement nor the outcomes are described or included.³²⁻³⁵ On the other hand, a foot care knowledge test is indicated as used in a study; however, neither design, source of the test, nor psychometric test for reliability and validity are reported.^{36,37}

Nevertheless, the lack of reliable and valid knowledge tests is widely recognized.^{13,38,39} Mason and colleagues³⁹ reported variation in teaching methods, foot care content, and intervention strategies in their systematic review of diabetes education research for foot ulcer prevention for patients with type 2 diabetes. Likewise, Valk et al⁴⁰ pointed out that the common practice of using subjective foot care knowledge tests may account for biased outcomes in controlled trials of diabetes education controlled studies. Other studies indicate that the topic of foot care knowledge appears in only a very limited way in diabetes education and that the extant foot care knowledge tests are inadequate or have undocumented psychometric properties.⁴¹ Consequently, there is a need for reliable and valid foot care knowledge tests to determine the efficacy of patient lower extremity intervention and prevention service programs, particularly for older adults.

Purpose of the Study

Although growing areas of research have focused on the important role of attitudes and beliefs,⁴² a lack of reliable and valid means to assess the efficacy of educational interventions is consistently noted as a major weakness in diabetes patient education research.^{14,43} This article reports the results from the initial phase of a larger study to develop and evaluate the psychometric properties of an instrument to measure the foot care

knowledge of older adults with diabetes. Subsequently, this instrument will be used to evaluate diabetes foot care programs and patient self-management strategies. The primary purpose of this portion of the study was to identify foot care behaviors that diabetes nurse educators perceived important for elderly people to enact daily.

Research Design and Methodology

Design

Increasingly, qualitative methods are employed to generate items for instrument construction for increased breadth and scope. As Imle and Atwood noted, “Of the psychometric criteria for an adequate scale, one criterion that is well accepted . . . in both qualitative and psychometric research is that of the adequate depiction of the essential components of a phenomena.”^{44(p63)} Because the instrument is intended to measure knowledge content, a straightforward descriptive qualitative approach was selected over more interpretive approaches such as phenomenology or grounded theory.^{45,46} This method yields information to support the development of test items consistent with the variable identified for outcome measurement.⁴⁷ This strategic method is appropriate when instruments are inadequate or are applied to populations or settings different from the original.⁴⁸

Within the paradigm of descriptive qualitative research, this study used structured, open-ended questions to elicit diabetes nurse educators’ detailed and ranked free-listed units of data for item generation.⁴⁷ As Thompson and colleagues outlined a facet of a quantitative project in team-based qualitative research, these items were then sorted into categories and domains consistent with procedural “interpretation of raw data”^{49(p16)} for thematic coding.

Subject Recruitment

A regionally stratified national random sample of 90 diabetes nurse educators (15 from each of 6 geographic regions across the United States) selected from the active membership list of the AADE were mailed a questionnaire. Subjects indicated their consent for participation in the study by completing the survey. The Behavioral and Social Sciences Human Subjects Review Committee at The Ohio State University approved this study. To

Table 1

Foot Care Knowledge Domains

Domain	Definition
Foot/nail care	Routine measures undertaken daily/regularly to maintain the integrity of the skin and toenails of the foot
Footwear, shoes	The use and/or maintenance of any item designed as a hard outer covering for the foot
General health	Any general activity designed to promote or optimize health status as a direct or indirect measure to avert problems associated with the feet
Foot emergencies	The care and treatment of an acute physical trauma or insult to the foot or leg

enhance survey response rate, reminder cards were mailed to diabetes educators 1 week later, with a complete survey packet mailed to nonrespondents 1 month following. All surveys received 1 month following the second mailing were used for final data analysis. As the membership list included diabetes educators who worked with patients of all ages, the cover letter asked only those who worked with patients 60 to 75 years of age to complete the questionnaire. To confirm their eligibility for participation in the study, educators were asked to indicate the age range of patients they serviced in their practice setting. Based on this criterion, the names of those not eligible were then removed from the subject list. Sixty-four (71%) diabetes nurse educators responded to the survey; 47 (73%) of those respondents were eligible for inclusion based on their practice characteristics.

Questionnaire

Data Collection Procedures

The questionnaire used an open-ended format asking the diabetes nurse educators to identify in their own words 8 foot care behaviors they considered the most important for older adults with diabetes to enact in daily

foot care. Diabetes nurse educators were instructed to list foot care behaviors in rank order, with 1 being the most important. Each foot care behavior as listed by diabetes nurse educators was characterized as a full-text thematic unit of data for content analysis. Each statement of foot care behavior was coded and transcribed on 2 sets of cards; the numeric rank value of importance as attributed by the diabetes nurse educators was not included in the transcribed materials.

Data Analysis

The authors independently reviewed and classified the free-listed foot care behaviors into categories using standard pile-sort strategies⁵⁰ and then into 1 of 4 foot care knowledge domains defined a priori for this study (Table 1). Subsequently, the authors compared their categorization and classifications, discussing differences until consensus was reached and the categories could be placed exclusively in 1 foot care knowledge domain. As suggested by Weller and Romney,⁵¹ 2 procedures were used to assess item saliency. First, the overall number (n) of foot care behavior statements classified per foot care knowledge domain was determined followed by calculating the ranking of the domains. Because the diabetes educators had been asked to list 8 foot care behaviors in rank order, the overall mean (\bar{x}) rank value of the foot care knowledge domains was able to be determined.

Results

Sample

Table 2 depicts the demographic characteristics of the diabetes nurse educators. Educators averaged 18 years in nursing, 7 years in diabetes education with 72% certified in diabetes education. Forty-seven percent reported the outpatient setting as their primary practice site, although 62% of all educators offered both inpatient and outpatient diabetes education classes. Diabetes nurse educators estimated that an average of 14% of education class time was devoted to teaching foot care. Educators provided a range from 10 to 1500 one-on-one patient teaching sessions per year. Of those sessions, approximately 50% included "some" teaching of foot care, with an average of 11% of those sessions devoted "solely" to teaching diabetes foot care.

Foot Care Knowledge Domains and Foot Care Behavior Content Categories

Diabetes nurse educators identified a total of 346 foot care behaviors important for elderly people to enact in daily care; not all educators listed the maximum number of 8 behaviors on the list of rank order of importance. Four major domains of patient foot care knowledge with their associated foot care behavior content categories were identified: foot/nail care (7 content categories), footwear/shoes (4 content categories), general health (9 content categories), and foot emergencies (1 content category). These are presented in descending order (see Table 3).

Foot/Nail Care

Foot/nail care was the domain with the greatest number of foot care behaviors (n = 157) and with the highest overall mean rank value of importance (\bar{x} = 3.67) as identified by diabetes nurse educators. This domain included 7 foot care behavior content categories with Inspect Feet Routinely (n = 45) containing the largest number of foot care behaviors. Examples of items in this category included statements such as "look at feet daily," "check feet daily with both eyes and hands," "daily or frequent examination of the feet," and "check feet daily (or have a family member check)." Furthermore, of these 45 foot care behavior statements, 36 of them were ranked number one, the most important perceived by diabetes nurse educators for elderly people to enact daily (\bar{x} = 1.51).

The second most important foot care behavior category described within this domain was Wash Feet Daily (n = 36, \bar{x} = 2.58), with the most common foot care behaviors expressed in statements such as "clean feet daily" and "daily washing of feet." The third category perceived most important was Dry Toes (n=7, \bar{x} = 3.42). However, Proper Nail Care represented the third largest number of foot care behaviors (n = 35), although most of them were ranked by diabetes nurse educators from fourth to fifth important for elders to enact daily. Conversely, whereas "moisturize skin" foot care behaviors (eg, "use lotion on skin every day," "apply moisturizing cream daily") had a fewer number of statements (n = 25), they were ranked from second to fourth most important by diabetes nurse educators.

Table 2

Demographic Characteristics of Diabetes Nurse Educators (n = 47)

	n	%	\bar{x}	Minimum	Maximum
Certified diabetes educator*					
Yes	33	72			
No	13	28			
Education level*					
Diploma	6	13			
Associate's degree	3	7			
Bachelor's degree	28	61			
Master's degree	9	20			
Years in diabetes education*			7.03	1	20
Years in nursing [†]			17.91	2	40
Employer*					
Hospital >700 beds	1	2			
Hospital 500-699 beds	3	7			
Hospital 300-499 beds	11	24			
Hospital 100-299 beds	16	35			
Hospital <100 beds	2	4			
Physician office	3	7			
Public health/home care agency	2	4			
College/university	1	2			
Other: health maintenance organization (3), rehabilitation center for the blind, large clinic, home health care, state	7	15			
Primary practice setting					
Inpatient	18	38			
Outpatient	22	47			
Other	4	9			
Formal education classes					
Yes, inpatient	15	32			
Yes, outpatient	27	57			
No	18	38			
% Class time teaching foot care			14.00	2	60
Offer inpatient/outpatient 1-on-1 teaching session					
Yes	45	96			
No	2	4			
Number sessions/y*			274.91	10	1500
% Sessions included foot care*		49.93		0	100
% Sessions devoted solely to foot care		11.20		0	75
*Missing 1.					
*Missing 2.					

Table 3

Foot Care Knowledge Domains and Foot Care Behavior Content Categories (N = 346)

Domain	Foot Care Behavior Content Categories	Foot Care Behavior Statements, n	Mean*
Foot/nail care	Inspect feet routinely	45	1.51
	Wash feet daily	36	2.58
	Dry toes	7	3.42
	Don't soak feet	4	4.00
	Moisturize skin	25	4.48
	Callous care	5	4.80
	Proper nail care	35	4.91
Total		157	3.67
Footwear/shoes	Wear shoes	24	3.50
	Wear clean socks	9	3.88
	Barefeet caution	18	4.88
	Inspect shoes	15	5.00
	Proper shoes	15	5.26
Total		81	4.50
General health	Other general health	17	3.94
	No self-surgery	11	4.90
	Prevent injury	6	5.16
	Temperature control	21	5.61
	Physician/podiatrist foot inspection	3	6.23
	Promote circulation/don't cross legs	19	6.42
	No damage with chemicals	4	6.50
Total		95	5.72
Foot emergencies	Attention to problems	15	6.00
Total		15	6.00

*Range = 1-8, 1 = most important.

Footwear/Shoes

Overall, this domain emerged as the second most important for elderly people to enact in daily foot care ($\bar{x} = 4.41$), with 63 behaviors contained in 4 content categories. In this domain, the category Wear Shoes comprised foot care behaviors reported most often and overall ranked most important ($n = 24$, $\bar{x} = 3.50$). Nearly all diabetes nurse educators were consistent in themes

stressing that patients “wear correctly fitting comfortable shoes.” Several also expressed the importance of breaking in new shoes gradually, as well as the use of leather and hard-soled shoes and the avoidance of open-toed shoes.

Next was foot care behaviors in 2 categories containing an equal number of statements, although with slight variance in rank value. For example, diabetes nurse educators emphasized that older adults should “check shoes before putting them on” and “daily inspection of footwear” (Inspect Shoes, $n = 15$, $\bar{x} = 5.00$) followed by indicating the importance of older adults to “buy shoes that fit properly” and “choosing proper fitting shoes” (Proper Shoes, $n = 15$, $\bar{x} = 5.26$). It was the theme of Wear Clean Socks that overall ranked second most important in this domain ($n = 9$, $\bar{x} = 3.88$), although it contained the fewest statements. For example, foot care behaviors described important were for elders to “wear clean socks every day” and “changing socks daily.” One diabetes educator specified the importance to “wear cotton socks,” while another particularly emphasized the importance for elders to “wear clean socks without holes.” The importance of socks was clear, as 5 of the 9 foot care behaviors in this category were ranked third most important

by diabetes nurse educators.

The category Barefeet Caution was associated with the importance of footwear ($n = 18$); 14 of the foot care behavior statements were distinctly expressed for elderly people to “don't” or “never go barefoot.” Also, several diabetes educators specified the importance for older adults to “never walk barefoot even in the home,” while several stated that older adults should never walk barefoot whether indoors or outdoors.

General Health

This domain contained the second largest number of foot care behaviors ($n = 113$ items) that diabetes nurse educators ranked overall third most important ($\bar{x} = 5.62$). While the category Temperature Control contained the most items ($n = 21$), the content category Other General Health was ranked most important in this domain ($\bar{x} = 3.94$ vs $\bar{x} = 5.61$). For example, diabetes nurse educators recommended older adults “stop smoking” and incorporate “daily hygiene,” “proper diet,” and “blood glucose monitoring” as integral components of patient foot care behavior. Patient foot care behavior themes of Temperature Control emerged as the overall fourth most important category ($\bar{x} = 5.61$), in which diabetes nurse educators strongly emphasized “never use hot water, hot soaks, heating pads, or hot water bottles on feet” as well as “check the temperature of the bath or the shower before using.” One educator indicated the water be “tepid” versus hot. Several diabetes educators indicated that patients should avoid the use of “heat treatments” and “heat/chemicals” on the feet.

The second most important category in the domain of general health was No Self-Surgery foot care behaviors ($n = 11$, $\bar{x} = 4.90$). Seven of these 11 behaviors were expressed by diabetes nurse educators in statements that elderly people not perform “bathroom surgery.” Several educators associated this theme with items such as “don’t do bathroom surgery for corns and calluses,” “stop self-surgery—not cutting on corns, hard toenails,” as well as “no bathroom surgery, leave ingrown toenails, etc, to a doctor.”

The foot care category Promote Circulation/Don’t Cross Legs” emerged with foot care behaviors overall ranked sixth most important ($\bar{x} = 6.42$); however, this category contained the second largest number of foot care behaviors perceived important by diabetes nurse educators ($n = 19$). Various interrelated themes emerged. For example, educators indicated elders should “not wear tight stockings, garters, socks,” “avoid the use of constricting socks, garters, or hosiery” and “do not wear tight hose or socks.” Others stated, “do what you can to keep circulation flowing,” “do not sit for long periods of time with your legs crossed,” and “avoid crossed legs.”

Foot Emergencies

Consistent themes that emerged in this domain were foot care behaviors that diabetes nurse educators ranked overall the fourth most important for elderly people ($n = 15$, $\bar{x} = 6.00$). This included the importance for elders to “promptly” recognize foot problems (eg, foot injury, cuts, and scratches) and report or seek medical care/treatment ($n = 15$, $\bar{x} = 6.00$). Several educators also perceived that such action should be for “any signs of infection.” Furthermore, 40% of the foot care behaviors specified that elderly people should report emergencies to their doctor, with several diabetes nurse educators indicating this action should be “immediate.”

Discussion

Four domains of foot care knowledge comprised 346 foot care behaviors perceived important by diabetes nurse educators for elders to enact daily. Based on content data analysis, the greatest number and ranked the most important were Foot and Nail Care behaviors; in particular, elders’ performing daily foot inspection was highly regarded as the most important. General Health Measures presented with the second greatest number of foot care behaviors, although the importance of wearing proper Footwear/Shoes emerged as the foot care behaviors ranked by diabetes nurse educators the second most important for elders. In situations in which Foot Emergencies occur, knowing when and how to seek emergency care and treatment also ranked important for elders.

As noted previously, assessment of patient foot care knowledge at first contact with the patient is in accord with recommendations for prevention and management of diabetes lower extremity complications.⁵² In a review of randomized controlled trials, foot care was a topic in diabetes patient education, in which almost 60% of teaching interventions were based on patient learning needs derived from initial patient assessment.⁴¹ Furthermore, diabetes nurse educators played an important role. Patients expressed satisfaction with health care service and participated in a higher rate of foot examination in programs with diabetes nurse educators defined as providers of foot care education.^{53,54}

Emphasizing foot/nail care in diabetes education highlights the particular importance of this topic. Studies have shown that elders who enact foot/nail activities such as properly washing their feet daily as well as trimming their toenails are at decreased risk for lower extremity amputation due to poor foot ulcer outcome.⁵⁵ Elders have expressed turning to health care providers for not only foot ulcer preventive services but also knowledge of appropriate footwear as hard cover protection for the foot for therapeutic purposes.^{56,57} For patients hospitalized for lower extremity complications, Reveal et al⁵⁸ found knowledge of footwear/shoes to be the focus of first-time diabetes education class attendants. Faglia et al⁵⁹ reported therapeutic footwear, along with intense foot care education at the time a patient is hospitalized for foot ulceration, to be effective in minimizing the risk of recurrent ulceration as well as risk for amputation. This includes education for family/significant others on footwear particularly effective for prevention of foot infections.⁶⁰ Furthermore, economic cost-effectiveness is determined associated with intense education on proper foot care and appropriate footwear aimed toward reducing incidence of foot ulcer and lower extremity amputation.⁶¹

Nonetheless, elders in diabetes education programs continue to report foot ulcers and amputations as 2 areas of major concern in their interaction with health care providers.^{62,63} Even so, health care professionals in practice at health care centers identify lack of time as 1 barrier to patient care, which includes diabetes patient foot examination⁶⁴ as well as patient preventive care and teaching.⁶⁵ This is evident in that diabetes educators have reported from 5% to 10% of their time devoted to patient education and care, with remaining job time unrelated to diabetes.⁶⁶ In the current study, diabetes nurse educators reported 14% of class time devoted to teaching foot care to elders along with 11% of one-on-one patient teaching sessions devoted solely to foot care teaching. Whether this reflects sufficient time available for diabetes educators to provide teaching services is unknown; assessment for this information was not included in the questionnaire. Also, the number of elderly patients consistently provided teaching services by educators are unknown.

Conclusion and Implications for Practice

The importance of foot care knowledge for the elderly person at risk for diabetes lower extremity complications remains an integral part of diabetes patient education consistent with individual, program, and national standards of the AADE and the ADA for health care professionals and diabetes care systems. In accordance with the diabetes foot care guidelines, patient self-care management of diabetes requires a vast array of information for their enactment of daily behavioral activities for preventive measures. However, several studies have associated the role of cognitive impairment with glucose control and physical disability and limitation in elders' activity of daily living.^{67,68} Hence, the diabetes nurse educators' assessment of patient foot care knowledge in initial, immediate patient contact is highly recommended and dependent on reliable and valid outcome measures, which are limited in number. To address this need, a national randomly stratified sample of diabetes nurse educators provided a wealth of thematic, highly interrelated baseline data of 346 patient foot care behaviors across 4 major patient foot care knowledge domains as the foundation for quantitative instrument development.

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