Diabetes symptoms and self-management behaviors in rural older adults

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ABSTRACT

Aims: To evaluate the demographic and health correlates of reporting diabetes symptoms, and the relationship between diabetes symptoms and self-management behaviors in rural older adults.

Methods: Cross-sectional interviews were conducted with 489 African American, American Indian, and white female and male adults 60 years and older. Participants with diabetes were recruited from eight North Carolina counties. Participants completed the 34-item Diabetes Symptom Checklist (DSC). Associations of demographic and health characteristics with reported symptoms were evaluated. Multivariate linear regression models were used to examine the associations of DSC scores and diabetes self-management.

Results: Participants had low scores on the DSC. They largely practiced appropriate diabetes self-management behaviors (self-foot checks, fruit and vegetable consumption, and self-monitoring blood glucose). Correlates of DSC included women having higher scores for hypoglycemia, psychological total, and fatigue dimensions. Neuropathic pain and vision dimensions were significantly associated with educational attainment. Most DSC dimensions were associated with ethnicity or economic status. Taking oral diabetes medicine was correlated with hyperglycemia; insulin use was associated with most DSC dimensions. HbA1c was not associated with any DSC dimension; diabetes duration >10 years was correlated with all dimensions except neuropathic pain and vision. Higher levels of psychological fatigue were significantly associated with fewer self-management behaviors.

Discussion/Conclusions: Demographic and health characteristics are associated with reported symptoms. Fatigue is a symptom negatively associated with diabetes self-management behavior in older adults. Health care providers are uniquely positioned to assess patient symptoms and potential relationships with successful diabetes management.

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1. Introduction

Type 2 diabetes mellitus is common among older adults and is associated with numerous co-morbidities. A myriad of complications is associated with diabetes; some of these complications can be monitored by recognition and response to the common symptoms of the disease. Both acute and chronic symptoms may be experienced by patients, including the classic symptoms of thirst, hunger, and frequent urination, as well as other common symptoms, including visual blurring, numbness and tingling in the extremities, calf pain on walking, and fatigue [1,2]. Monitoring discomfort and frequency of symptoms related to diabetes is one way that patients can report their experiences with diabetes and glucose regulation [3]. Understanding and communicating diabetes symptoms can contribute to a patient's success related to performing self-management tasks, such as physical activity, glucose self-monitoring, and diet [4,5].

Chronic diseases such as diabetes incorporate beliefs and knowledge across a spectrum of self-management perceptions [6,7]. Symptom awareness can also signal a person to implement specific health care practice [8–10]. Previous studies have reported that older individuals' diabetes symptom interpretation may differ between age groups [11,12]. Many older adults may attribute their experiences with common diabetes symptoms to the normal processes of aging. Older patients can monitor diabetes with a focus on distinguishing disease-specific symptoms and how to best communicate that information to health care providers. Although progress has been made in characterizing acute symptoms of diabetes, chronic symptom recognition has not been fully appreciated in older adults. There are limited data on the patterns of diabetes symptom recognition and day-to-day self-management in older individuals.

This study has two major aims: (1) to evaluate the demographic and health correlates of diabetes symptom recognition in an older multi-ethnic sample of adults with diabetes who reside in rural counties in south-central North Carolina and, (2) to examine the association of diabetes symptom recognition and self-management behaviors (self-foot checks, fruit and vegetable consumption, exercise participation, self-monitoring of blood glucose, and provider foot and HbA1c checks) in this population.

2. Research design and methods

2.1. Sample

Data are from a broader study of beliefs and attitudes of rural-dwelling older adults with diabetes [13,14]. The sample included a total of 563 African American, American Indian, and white participants who had type 2 diabetes, were age 60 years or older, and were not receiving dialysis treatment. Participants were recruited from 8 south-central counties (Harnett, Hoke, Montgomery, Moore, Richmond, Robeson, Sampson, and Scotland) in North Carolina. A site-based sampling procedure was used to recruit study participants [15]. The goal of the sampling plan was to recruit an equal number of participants for each ethnic/gender cell, with each cell having participants spread across educational attainment categories. The study counties were chosen because they contained large minority populations and because a high proportion of the population was below the federal poverty line. They represented variation on the urban-rural continuum such that one was in a metropolitan area with an urban population of 2500–19,999, one was a nonmetropolitan county with urban population of 20,000 or more, and one was a nonmetropolitan county with urban population of 2500–19,999 [16].

The 20-item Center for Epidemiological Study of Depression (CES-D) scale was used to assess depressive symptomology [17]. A modified version of the CES-D that contained responses of "yes" or "no" instead of the traditional likert scale responses was utilized to assess participant depressive symptomatology [18,19]. Because of the potential relationship with depressive symptomatology and the DSC items, participants were excluded from this analysis if CES-D scores were ≥9, potentially indicative of depression. This led to the removal of 74 participants from the analysis for a final sample size of 489.

2.2. Data collection

Data collection was conducted from June 2009 through February 2010. Participants completed an interviewer-administered, fixed-response questionnaire, and a finger stick blood draw for the HbA1c test using the procedures for the Bayer A1cNow+ device. Results were dichotomized at <7.0% and ≥7.0% [20]. Data collection was conducted at the home of the participant, unless the participant asked to meet elsewhere. Interviewers outlined the project objectives and obtained written informed consent. An incentive ($10) was offered for completing the interview. Informed consent was collected from all study participants. Personal characteristics consisted of age, gender, ethnicity, educational attainment, marital status, and household income. A federally authorized Institutional Review Board (FWA #00001435) approved all sampling, recruitment, and data collection procedures.

2.3. Study measures

Participant personal characteristics were obtained by self-report and included age, marital status, economic status, and ethnicity (African American, American Indian, and non-Hispanic white). Age was grouped as 60–74 or ≥75. Educational attainment was classified into categories including less than a high school education, high school graduate, or education beyond high school. Marital status (married or not married), diabetes duration (<10 years, ≥10 years), poverty level (above or below poverty line) and use of medications (oral agents and/or insulin) were evaluated as dichotomous measures.

The primary outcome for this analysis was diabetes symptoms. The Type 2 Diabetes Symptom Checklist (DSC), a 34-item checklist, was used to capture both occurrence and perceived burden of the physical and psychological symptoms related to diabetes and its possible complications. Items were contained in six dimensions (hyperglycemia, hypoglycemia, psychological, cardiovascular, neuropathy, and ophthalmological). The DSC had acceptable internal consistency (e.g., $\alpha = .76$)