



Communication Study

Health communication, self-care, and treatment satisfaction among low-income diabetes patients in a public health setting



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ABSTRACT

Objective: Diabetes patients with limited resources often experience suboptimal care. Less is known about the role of effective health communication (HC) in caring for low income diabetes patients.

Methods: Ten health department clinics in TN participated in a trial evaluating a literacy-sensitive communication intervention. We assessed the quality of baseline HC and measured associations with diabetes outcomes. Assessments included: demographics, measures of HC, health literacy, self-care behaviors, self-efficacy, medication non-adherence, treatment satisfaction, and A1C. Unadjusted and adjusted multivariable regression models were used to test associations.

Results: Participants ($N = 411$) were 49.7 ± 9.5 years, 61% female, uninsured (96%), with A1C 9.6 ± 2.1 . In unadjusted analyses, better communication, was associated with lower medication non-adherence (OR 0.40–0.68, all $p < 0.05$), higher treatment satisfaction (OR 1.76–1.96, all $p < 0.01$), portion size reduction (OR 1.43, $p < 0.05$), diabetes self-efficacy (OR 1.41, $p < 0.05$), and lower A1C ($\beta = -0.06$, $p < 0.01$). In adjusted analyses, communication quality remained associated with lower medication non-adherence (AOR 0.39–0.68, all $p < 0.05$), and higher treatment satisfaction (AOR 1.90–2.21, all $p < 0.001$).

Conclusions: Better communication between low-income patients and providers was independently associated with lower medication non-adherence and higher treatment satisfaction.

Practice Implications: Communication quality may be an important modifiable approach to improving diabetes care for vulnerable populations.

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1. Introduction

Approximately 26 million people in the US have been diagnosed with diabetes, placing them at increased risk for the many untoward complications of poor control [1]. Often, minority diabetes patients and those with limited resources face disproportionate challenges such as greater barriers to access, poorer health outcomes, and increased burden of disease [2]. Many of these patients seek care in public healthcare settings, where despite strong evidence about the optimal treatment of diabetes, care

often remains suboptimal [2–5]. Unfortunately, national efforts to achieve benchmarks in quality of care for these groups continue to fall short [6,7].

Ineffective health communication between patients and providers in public healthcare settings may contribute to suboptimal care. Providers in these settings often report time constraints, challenge to continuity of caring for patients, and greater limitations of staffing and resources, compared to private settings [8–10]. Additionally, patient factors such as limitations in health literacy and diabetes-specific numeracy (i.e. computational) skills may potentiate existing challenges to effective health communication when attempting to provide care for vulnerable populations [11,12]. Low health literacy and diabetes numeracy are recognized barriers to adequate diabetes care [13,14]. We have conducted several studies among both English and Spanish-speaking diabetes patients that have identified moderate to high prevalence of limited functional health literacy

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and numeracy skills [15–20]. We have also shown these limitations to be significantly associated with several diabetes-related factors such as poorer self-efficacy for self-management, less diabetes knowledge, worse medication adherence, and poorer glycemic control [15,17–25]. Although patients with limited literacy and numeracy skills may experience poorer communication with their provider [26], less is known about the specific relationship between the patient–provider interaction and diabetes related outcomes; and current evidence has been shown to be of mixed quality as supported by a recent systematic review [13].

Academic and community partnerships may be an effective model for improving communication in healthcare and addressing disparities of diabetes care for underserved populations [27,28]. The aims of this article therefore seek to address two specific research questions based on assessment of baseline data from a larger clinical trial occurring within the context of an academic–community partnership: (1) What is the perception of the quality of communication during clinical encounters by diabetes patients seeking care in a public health department setting?, and (2) What is the association among patients' perception of the quality of communication and reports of self-care behaviors, treatment satisfaction, self-efficacy, and glycemic control?

2. Methods

2.1. Study setting and patients

In 2010 we established a partnership between an academic medical center and a regional health department in Tennessee whose state diabetes prevalence that year was high at 10.2% compared to the national average of 8.3% [1,29]. The PRIDE Study (Partner to Improve Diabetes Education) is a prospective, cluster randomized–controlled trial designed to address health communication issues and develop a sustainable model for improving diabetes care in our region that includes both urban and rural settings [30].

Providers, including physicians, nurse practitioners, nurses, dietitians, and medical interpreters employed within 10 State Health Department Clinics were invited to participate, and clinics were randomly assigned to one of two conditions. Providers at five intervention sites were exposed to training in effective health communication including instruction on working with low health literacy populations, strategies for improving communication during clinical encounters (e.g. teach back, goal setting, reduction of jargon, motivational interviewing), and effective use of medical interpreters. In addition to evidence-based updates in diabetes care, these providers also received education on the use of a diabetes toolkit designed specifically for use among patients with limited literacy and numeracy skills [31]. The remaining five clinics were provided evidence-based updates in diabetes care and were given educational materials from the National Diabetes Education Program to share with patients. These five clinics did not receive any training in effective health communication.

Eligible patients at participating clinics included individuals with a diagnosis of Type 2 diabetes, between the ages of 18 and 85, English and/or Spanish-speaking, A1C \geq 7.5%, and agreeing to the 2-year duration of the study. Patients were excluded for poor visual acuity ($>$ 20/50 on a pocket screener), clinically significant dementia/psychosis, or if they had a life expectancy less than 2 years. Providers that participated in the intervention or control site training sessions were incentivized with state-approved continuing education credits while patients received a cash remuneration of \$20 following completion of baseline data collection. The Vanderbilt University and Tennessee State Health Department IRBs provided study approval prior to enrollment.

2.2. Main measures

Patients were approached by bilingual research staff during regular clinic hours and by phone referral from clinic staff with informed consent obtained in the patient's language of preference (English or Spanish). Baseline patient assessments included collection of demographic, anthropometric (height, weight, BMI), and clinical measures (blood pressure, A1C, lipid profile). Before the clinical encounter with a provider, each participant reported their current diabetes self-care behaviors including responses to a Personal Diabetes Questionnaire (PDQ-11) and the Adherence to Refills and Medications Scale (ARMS). The PDQ-11 is an eleven item version of an original 68-item scale [32] that assesses an individual's current and planned nutritional and exercise behaviors. The ARMS is a validated 12-item measure that evaluates an individual's level of medication non-adherence in the areas of medication taking and refill behaviors [33]. Psychometric assessment of the PDQ-11 indicated it is best to combine the first three items into a Poor Eating Behavior subscale (Cronbach's alpha = 0.66) and items 4, 5, and 6 into a Use of Data to Modify Diet subscale (Cronbach's alpha = 0.81). The remaining five items assess the frequency of meal skipping, portion control, physical activity, and stages of change for exercise & weight management and were treated as individual variables. Higher scores on the PDQ-11 indicate greater presence of the reported behavior and scores \geq 16 on the ARMS reflect greater medication non-adherence. Health literacy was measured using the Short Test of Functional Health Literacy in Adults (s-TOFHLA) [34] and responses were dichotomized to adequate vs. less-than-adequate for scores \geq 23 or \leq 22 respectively. Diabetes treatment satisfaction and diabetes related self-efficacy were assessed using the Diabetes Treatment Satisfaction Questionnaire (DTSQ) and Perceived Diabetes Self-Management Scale (PDSMS) where higher scores indicate greater treatment satisfaction and self-efficacy respectively [35,36].

Two measures of health communication were administered to each participant, one before and the other after the initial clinical encounter. The Interpersonal Processes of Care Survey (IPC-18), the “before” measure, has been validated in a multi-ethnic population and measures patients' perception of provider communication on several dimensions [37]. We report the IPC-18 using three broad domains as recommended by Stewart et al. – (1) Communication includes the dimensions of “lack of clarity,” “elicitation of concerns,” and “explanation of results;” (2) Decision Making represents the dimension “working together;” and (3) Interpersonal Style includes the dimensions “compassionate” and “discriminated due to race/ethnicity” [38]. Questions referring to office staff were excluded to isolate patients' perception of provider communication only. The Communication Assessment Tool (CAT) was administered *after* the encounter. The CAT measures perceptions of physician performance in the areas of communication and interpersonal skills and has been evaluated in a variety of care settings and among diverse patients [39].

2.3. Statistical analysis

Patient characteristics were summarized using mean \pm SD for continuous and ordinal variables, and proportions for categorical variables. Our main outcomes of interest were treatment satisfaction (DTSQ), medication non-adherence (ARMS), diabetes self-care behaviors (PDQ-11), self-efficacy (PDSMS), and glycemic control (A1C). We examined the independent association of these outcomes with each of the measured communication variables: IPC-18 domains (Communication, Decision Making, and Interpersonal Style) and CAT score. Responses for all communication variables were dichotomized to compare scores of 5 to scores $<$ 5 so as to account for the tendency of values to cluster around positive responses (i.e. positive skew) and

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