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Communication Study

Communication competence, self-care behaviors and glucose control in patients with type 2 diabetes

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ABSTRACT

Objective: To examine the relationship between physician communication competence and A1c control among Hispanics and non-Hispanics seen in primary care practices.
Study design: Observational.
Methods: Direct observation and audio-recording of patient–physician encounters by 155 Hispanic and non-Hispanic white patients seen by 40 physicians in 20 different primary care clinics. Audio-recordings were transcribed and coded to derive an overall communication competence score for the physician. An exit survey was administered to each patient to assess self-care activities and their medical record was abstracted for the most recent glycosylated hemoglobin (A1c) level.
Results: Higher levels of communication competence were associated with lower levels of A1c for Hispanics, but not non-Hispanic white patients. Although communication competence was associated with better self-reported diet behaviors, diet was not associated with A1c control. Across all patients, higher levels of communication competence were associated with improved A1c control after controlling for age, ethnicity and diet adherence.
Conclusions: Physician's communication competence may be more important for promoting clinical success in disadvantaged patients.
Practice implications: Acquisition of communication competence skills may be an important component in interventions to eliminate Hispanic disparities in glucose control.
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1. Background

Despite intense interest in improving outcomes for type 2 diabetes mellitus, improvements in glucose control remains elusive for many patients. Results from two rounds of the National Health and Nutrition Examination Survey, in 1988–2004 and 1999–2002, show that the proportion of patients with a glycosylated hemoglobin above 9% decreased only slightly to 21% [1]. More recently, NHANES results show an improvement in glycosylated hemoglobin levels between 1999 and 2004 for most sub-groups of the population, with the exception of Hispanics. (Hoerger TJ, Gregg EW, Segel JE, Saaddine JB. Is glycemic control improving in U.S. adults? Diabetes Care 2008;31:81–6.) Other studies have documented that A1c control is worse among Hispanics than non-Hispanics [2,3].

Diabetes mellitus is a complex illness that requires close collaboration between a proactive health care team and informed patients [4,5]. Clinicians and patients must negotiate among busy and often competing agendas in both the clinical encounter and the patient's life circumstances. Ultimately, care processes must be translated into effective patient self-care activities such as diet and exercise to achieve successful outcomes like glucose control [6,7].

The translation sequence from clinical care to effective self-management has many steps, but effective physician–patient communication is one of the key elements to promote shared understanding of goals and strategies for self-management [6,8]. This may especially be true for minority groups who often have lower levels of health literacy (Nielsen-Bohlman LT, Panzer AM, Hamlin B, Kindig DA, editors. Institute of Medicine. Health literacy: a prescription to end confusion. Committee on Health Literacy, Board on Neuroscience and Behavioral Health. Washington, DC: National Academies Press; April 2004.) There is evidence that less effective communication between physicians and minority patients contributes to disparities in disease outcomes [9–11]. For example, Hispanics are less likely than other ethnic groups to feel their physicians adequately listen, involve, and spend time

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with them, and in turn understand less of what their physician has to say [12,13].

Measuring or observing effective communication between physicians and patients is challenging because it occurs behind the exam room door and is often not directly observed or recorded [14]. Many studies depend on patient ratings of the quality of their communication with their physician [14,15]. Unfortunately, these types of patient perceived ratings have been shown to be strongly correlated with patient health status, raising the question of their objectivity [16].

An alternative conceptualization of effective physician–patient communication is the concept of physician communication competence, a set of physician behaviors that are theorized to be important components of effective communication. One advantage of this measure is that it relies on third party assessment rather than patient self-report. The domains of physician communication competence have recently been defined and include: rapport building; information management; agenda setting; active listening; addresses feelings; reaches common ground [17]. Combined, these domains contribute toward an overall level of communication competence [17]. More recently, methods of observing and coding patient–physician encounters for each of these have been validated [18].

The purpose of this study is to examine the relationship between physician communicative competence, self-care behaviors and glucose control, as measured by A1c, among Hispanics and non-Hispanic white patients with type 2 diabetes seen in primary care practices. We measure overall communicative competence and hypothesize that patients with encounters where the physician demonstrates higher levels of communication competence will report higher levels of self-care and will have better glucose control.

2. Methods

The Direct Observation of Diabetes Care study was conducted in 20 primary care clinics with 45 primary care physicians and has been described in detail elsewhere [19,20]. The study design was cross-sectional and observational: no interventions were performed and participants received their usual care from their primary care physician. None of the physicians were trainees. Within each clinic, consecutive patients presenting with an established diagnosis of type 2 diabetes were recruited to participate in the study. Only three of the patients approached declined participation. A trained observer accompanied the first 8–10 consenting patients in each clinic to the exam room to directly observe and audio-record the encounter. None of the patients approached declined to participate. Following each encounter, patients completed a survey about self-care behaviors and had their medical record abstracted to obtain the most recent value of A1c.

2.1. Physician communication competence

A group of international experts developed a set of criteria to evaluate physician's communicative competence [17]. The *common ground rating* (*CGR*) form was developed as a tool to measure these criteria in physicians' communications with their patients, as well as to provide a measure of a physician's overall communication competence [18]. The *CGR* assesses competence in seven areas identified by experts as contributing strongly to effective communication: rapport building, information management, agenda setting, active listening, addresses feelings, reaches common ground and overall competence. Inter-rater reliability for the CGR good at 0.92 as was test–retest reliability at 0.84 [21]. The correlation between the instrument and a panel of communication experts was good at 0.84 indicating a high level of both construct and concurrent validity [21]. Independent review of the instrument has concluded that it has strong psychometric properties [22].

Transcripts of each patient–physician encounter were coded using the *CGR* form. Three raters, including the fourth author, worked together across several training sessions to develop familiarity with the coding system. Two of those raters then independently coded 25% of the transcripts. Inter-rater reliability for the individual categories was then calculated. The range of possible values for the overall communication competence score was from 0 to 5.

2.2. Patient self-care behaviors

Patient characteristics were obtained by survey: age, gender and race/ethnicity. Self-care behaviors for diet, exercise and medication adherence were assessed using single item questions with response categories corresponding to stage of change from the trans-theoretical model: pre-contemplation, contemplation, preparation, action and maintenance [23–25]. For example, for diet, patients were asked if they had followed their diet as instructed by health care providers and response categories were: "yes, I have been for more than 6 months;" "yes, I have been but for less than 6 months;" "no, but I plan to in the next 6 months;" "no, but I plant to in the next 6 months;" and "no, and I do not intend to in the next 6 months." For the analysis, we constructed the stage of change variable as a dichotomous outcome: yes the patient is in the maintenance stage of change, or not, for each self-care behavior. Patients in the maintenance stage of change reported that they have been adherent to diet or exercise for at least the past 6 months.

2.3. Analysis

We used Chi-squares and *t*-tests to compare demographic and other characteristics between Hispanic and non-Hispanic white patients. Each ethnic group was then analyzed separately. The strength and direction of the association between overall communication competence (OCC) and A1c were assessed with partial correlation analyses, and *t*-tests were used to compare A1c and OCC values between patients who were and who were not in maintenance stage of change for each self-care behavior. This study was reviewed and approved by the Institutional Review Board at the University of Texas Health Sciences Center in San Antonio and by the Institutional Review Board at the University of Texas at San Antonio.

3. Results

A total of 211 encounters between physicians and patients were observed. Of these, 177 had an A1c recorded in their medical record prior to the encounter. 22 encounters were conducted in Spanish, leaving 155 in the final sample. All of the patients self-reported as either Hispanic or non-Hispanic white.

Table 1 displays the mean scores representing other demographic and health-related characteristics of the Hispanic and non-Hispanic white patients, the mean OCC scores for physicians treating patients from each group, and the *t*-values comparing each set of scores. None of the demographic characteristics were different between the two groups except for education. The distribution of high school graduates across the two ethnic groups was found to be significantly different from that expected by chance, $\chi^2\ (1) = 18{,}79$, $p < .01$. High school graduates comprised 67% of the Hispanic sample and 93% of the non-Hispanic white sample. In addition, non-Hispanic white patients were taking

Table 1
Comparisons of Hispanic and non-Hispanic white ($n = 155$).

	Hispanic ($n = 87$)	Non-Hispanic ($n = 68$)	p-Value
Age	57.8 (12.7)	59.8 (13.9)	0.25
Female (%)	50.4	50.3	0.50
Maintenance stage of change (%)			
Diet	44.2	36.7	0.35
Exercise	51.6	38.3	0.11
Medication adhere	85.9	79.0	0.27
A1c	7.68 (1.66)	7.24 (1.51	0.12
Communication competence (OCC)	3.43 (0.70)	3.58 (0.85)	0.19
	Hispanic ($n = 87$)	Non-Hispanic ($n = 68$)	
Communication competence scores and maintenance stage of change for			
Diet			
Yes	3.60 (.66)	3.81 (.96)	
No	3.28 (.66)	3.45 (.76)	
(p-Value)	(0.05)	(0.07)	
Exercise			
Yes	3.50 (.65)	3.70 (.76)	
No	3.34 (.71)	3.51 (.90)	
(p-Value)	(0.54)	(0.22)	
Medication adherence			
Yes	3.40 (.67)	3.71 (.81)	
No	3.31 (.63)	3.17 (.83)	
(p-Value)	(0.53)	(0.06)	
A1c and maintenance stage of change for			
Diet			
Yes	7.22 (1.71)	7.23 (1.37)	
No	8.06 (1.81)	7.25 (1.74)	
(p-Value)	(0.05)	(0.69)	
Exercise			
Yes	7.58(1.77)	7.17 (1.77)	
No	7.82 (1.87)	7.28 (1.35)	
(p-Value)	(0.55)	(0.64)	
Medication adherence			
Yes	7.71 (1.83)	7.07 (1.14)	
No	7.84 (1.81)	7.48 (1.32)	
(p-Value)	(0.59)	(0.66)	

significantly more medications for their diabetes and other chronic conditions than were Hispanic patients. There were no significant differences in the number of diagnoses or in the number of visits patients from the two groups had made to their physician over the past year. Although the differences were not significant, a higher proportion of Hispanics reported that they were in maintenance stage of change for all self-care behaviors than did non-Hispanics. Of note is the finding the difference in communication competence during encounters by Hispanic compared to those by non-Hispanic patients was not significant. Regarding self-care behaviors, although a higher proportion of Hispanics reported self-care behaviors in the maintenance stage of change, none of these differences were significant. Overall, 41% of patients reported adherence to diet regimes, 46% reported adherence to exercise regimes, and 83% reported adherence to medication regimes.

Cronbach's alphas were calculated separately for physicians' communication competence with Hispanic and non-Hispanic white patients in order to determine the internal consistency across the seven scale scores obtained using the common ground rating form. For both groups, alpha = .87, indicating a high level of internal consistency. Inter-rater reliability was similar to that obtained by Lang et al. [18], and was 0.70 across all categories. Thus, the global score of overall communication competence (OCC), rather than the sub-scale scores, was used in this analyses.

Table 2
Multivariate model: predictors of A1c control.

	Standardized coefficient	t-Value	p-Value
Age	−0.23	−2.89	<0.01
Non-Hispanic	−0.33	−1.17	0.24
Diet	0.06	0.71	0.48
Communication competence	−0.17	−2.13	0.04

Communication competence scores ranged from 2.0 to 5.0 out of a possible range from 0 to 5, with higher scores indicating greater competence. There was no difference in communication competence scores when encounters with Hispanics were compared to encounters with non-Hispanic whites. Approximately half of the encounters had scores of 3 or lower, and half had scores of 4 or higher. When communication competence is divided into two categories: high OCC with scores of 4 or 5, low OCC with values 3 or less, patients of physicians with high communication competence have an A1c value of 7.15 compared to 7.88 for those with low communication competence, regardless of ethnicity (t-test = 2.62, $p = 0.01$). However, for encounters with Hispanic patients, higher levels of physician communicative competence were significantly associated with lower levels of A1c ($r = -.22$, $p = .04$). This was not true for encounters with non-Hispanic white patients ($r = -0.16$, $p = .25$).

As shown in Table 1, Hispanic patients who were in maintenance SOC for diet had encounters where the physician demonstrated a higher level of communication competence and lower levels of A1c. The same was not true for non-Hispanic white patients. There was no significant difference in communication competence and A1c levels for patients who were in maintenance SOC for exercise or medication adherence for either group, with the exception that for non-Hispanic white patients, patients who were in maintenance SOC for medication adherence had encounters with a higher level of communication competence.

In a multivariate analysis that controlled for age, diet self-care activities and Hispanic ethnicity, higher levels of communication competence were still associated with lower values of A1c (Table 2). There was no association between Hispanic ethnicity and A1c in this final model, nor was diet associated with A1c. Age was associated with A1c: as age increased, A1c levels decreased.

4. Discussion and conclusion

4.1. Discussion

The results of this study suggest that communication competence of the physician during the encounter is associated with glucose control as reflected in A1c levels. In addition, communication competence was associated with diet self-care activities in the hypothesized direction. However, self-reported diet, exercise or medication adherence was not associated with glucose control. Our results are consistent with prior studies which have shown that physician communication behaviors predict glucose control [26].

There was no significant difference in communication competence of the physician during encounters with Hispanic patients compared to non-Hispanic patients. Although reassuring, this finding is not consistent with prior studies of physician communication with minority patients. For example, Johnson and colleagues found that physicians were 23% more verbally dominant and 33% less patient-centered in their communication with African American patients compared to white patients (Johnson RL, Roter D, Powe NR, Cooper LA. Patient race/ethnicity and quality of patient–physician communication during medical visits. Am J Public Health 2004;94:2084–2090). This finding is

especially interesting given that patient–physician communication has been postulated as an explanation for racial/ethnic health disparities (Smedley BD, Stith AY, Nelson AR. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Washington, DC. National Academy Press; 2002). We found no support for this hypothesis in this study.

Why is communication competence associated with glucose control? It is possible that there is a directionality issue in the observed relationship. That is, when they encounter a patient with better glucose control, physicians may be more likely to use techniques such as rapport building, active listening and addressing feelings instead of focusing on patient education and intensification of medication in an attempt to improve glucose control [27,28]. It is also possible that patients seen by physicians with a higher level of communication competence are less likely to be resistant to intensification of therapy such as initiating insulin for poor glucose control, and thus have better glucose control [29].

Why would communication competence be associated with glucose control for Hispanics, but not for non-Hispanics? It is possible that language problems contribute to a lack of understanding for Hispanic patients (Smelby, IOM). That is, communication competence may be more important to Hispanics if a language preference makes it more likely that they will not be able to fully understand what is being discussed by physician. This same language discrepancy may have led to over-reporting of their true self-care behaviors such as adherence to diet and medications as found in Table 1. Additionally, because the self-reported self-care behaviors only measure intended/conscious adherence, given the low education level and the complexity of diabetes self-care, this might have an influence on the general lack of relationship between self-care behaviors and A1c control. Finally, this result may be due to a difference in sample size between the two groups: with a smaller non-Hispanic sample, there may not be adequate power to detect a significant association.

Limitations of this study include the cross-sectional nature of the data leading to difficulties with interpreting the directionality of the relationships. The timing of the measurement of the outcome variable, A1c, is also a concern. That is, communication competence is measured in the observed encounter, but A1c is measured at a prior date. However, 98% of patients reported that the physician seen during the observed encounter is the physician who sees them for all of their diabetes care. If communication competence is a stable trait of the physician, as some have noted [34], then one would expect that physicians should demonstrate similar levels of communication competence during encounters prior to the measurement of the most recent A1c. In this sample, patients reported an average of 6.4 visits to this, their usual physician, in the prior 12 months. Finally, one might note that the 155 patients were nested or clustered within 20 clinics. When the final mutlivariate model (Table 2) was run in a random-effects model with clinics as a fixed effect, there was no difference in the outcomes.

4.2. Conclusion

Communication competence of the primary care physician, as measured with the common ground rating form, is associated with A1c levels in patients with type 2 diabetes. This may be more important for Hispanic patients with diabetes than non-Hispanic white patients.

4.3. Practice implications

The Accreditation Counsel on Graduate Medical Education (ACGME) has included communication competence as one of its six core competencies for graduates of accredited residency training programs in the United States [33]. Communication competence on the part of the physician has been demonstrated to be both a skill that can be taught as well as an innate quality of the individual [34]. The degree to which it is a skill suggests that improving outcomes like glucose control in patients with diabetes might be improved if physicians are willing to acquire this skill. The findings of this study also support on-going requirements in graduate medical education for the acquisition of communication competence as a core skill for all physicians.

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