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Unraveling the relationship between literacy, language proficiency, and patient–physician communication^{☆,☆☆}

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Abstract

Objective—To examine whether the effect of health literacy (HL) on patient–physician communication varies with patient–physician language concordance and communication type.

Methods—771 outpatients rated three types of patient–physician communication: receptive communication (physician to patient); proactive communication (patient to physician); and interactive, bidirectional communication. We assessed HL and language categories including: English-speakers, Spanish-speakers with Spanish-speaking physicians (Spanish-concordant), and Spanish-speakers without Spanish-speaking physicians (Spanish-discordant).

Results—Overall, the mean age of participants was 56 years, 58% were women, 53% were English-speakers, 23% Spanish-concordant, 24% Spanish-discordant, and 51% had limited HL. Thirty percent reported poor receptive, 28% poor proactive, and 56% poor interactive communication. In multivariable analyses, limited HL was associated with poor receptive and proactive communication. Spanish-concordance and discordance was associated with poor interactive communication. In stratified analyses, among English-speakers, limited HL was

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Conflict of interest

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associated with poor receptive and proactive, but not interactive communication. Among Spanish-concordant participants, limited HL was associated with poor proactive and interactive, but not receptive communication. Spanish-discordant participants reported the worst communication for all types, independent of HL.

Conclusion—Limited health literacy impedes patient–physician communication, but its effects vary with language concordance and communication type. For language discordant dyads, language barriers may supersede limited HL in impeding interactive communication.

Practice implications—Patient–physician communication interventions for diverse populations need to consider HL, language concordance, and communication type.

Keywords

Communication; Health literacy; Limited English proficiency; Health disparities

1. Introduction

It is estimated that 90 million Americans have limited literacy and 21 million have limited English proficiency [1,2]. Limited health literacy (HL—meaning literacy within the healthcare context), and limited English proficiency are common barriers to patient–physician communication. Patients with limited HL have been shown to have poor comprehension of physicians’ instructions, to ask few questions within the clinical encounter, and to more often report poor satisfaction with patient–physician communication [3–7]. In addition, limited English proficiency and language discordance between patients and their physicians have also been shown to result in poor comprehension, poor interactive communication, and dissatisfaction [8–10]. Poor patient–physician communication, due to HL and language barriers, contributes to poor healthcare quality and health disparities [5,6,8–13].

Although limited HL and limited English proficiency often coexist, prior research has tended to study HL and language barriers in isolation. We hypothesized that limited HL potentiates poor patient–physician communication among patients with limited English proficiency. Therefore, we examined whether the effect of HL on patient–physician communication varies with language concordance and type of communication among English and Spanish-speakers with chronic disease.

2. Methods

We pooled baseline interview data from 3 studies at 2 San Francisco Bay Area, safety net hospitals in the U.S.—hospitals committed to providing care to low income, uninsured, and vulnerable populations. These hospitals employ on-site, full-time interpreters. Recruitment procedures and interview methods have been previously described [14–17]. Briefly, one study was a cross-sectional, observational study of primary care patients at San Francisco General Hospital (SFGH) and was designed to assess the association of HL with diabetes outcomes ($n = 355$) [14]. A second study was a randomized controlled trial of primary care patients at SFGH and was designed to assess diabetes self-management support ($n = 278$) [15,16]. The third study was a cross-sectional, observational study of patients from a

cardiology clinic at Alameda County Medical Center and was designed to assess interpretation by video conferencing ($n = 138$) [17]. The baseline interviews for all study subjects were administered by bi-lingual research assistants and included questions on patient–physician communication.

Participants from the 3 studies were included in this analysis if they were 18 years, had diabetes and/or cardiac disease, were self-reported native English- or Spanish-speakers, had a primary care provider or cardiologist, and had made a visit with that provider in the prior 6 months. Participants were excluded if they had a diagnosis of a psychotic disorder, dementia, or blindness. All data were collected between 2000 and 2005. This study was approved by all university and hospital affiliated Institutional Review Boards.

2.1. Outcome measures

Across all 3 studies, we asked the same 3 questions in English and Spanish from the validated Interpersonal Processes of Care (IPC) instrument in Diverse Populations. These IPC questions assess the unique communication domains of *receptive communication* (unidirectional – physician to patient), *proactive* (unidirectional –patient to physician), and *interactive* (bidirectional) [5,18,19]. Specifically, we asked, “In the past 6 months, how often did you feel confused about what was going on with your medical care because your doctor did not explain things well?” (receptive); “... how often did your doctor give you enough time to say what you thought was important?” (proactive); and “... how often did your doctor ask if you might have any problems doing the recommended treatment?” (interactive). Participants reported their experiences using a 5-point Likert scale. We categorized communication as “poor” if participants responded “sometimes/usually/always” for receptive communication and “sometimes/rarely/never” for proactive or interactive communication [5].

2.2. Predictor variables

Health literacy level was assessed with the validated short form Test of Functional Health Literacy in Adults in English or Spanish [20]. By convention, we defined limited HL as scores $\leq 22/36$ and adequate HL as scores $>22/36$ [21]. To assess patient–physician language concordance, we first ascertained participants’ primary language by asking which language they were most comfortable speaking. Physician language was ascertained by asking participants if their physician could speak with them in the same language they were most comfortable speaking. The language concordance variable had 3 categories: native English-speaker (by definition English-speakers had English-concordant physicians); Spanish-concordant (Spanish-speakers with a Spanish-speaking physician); and Spanish-discordant (Spanish-speakers without a Spanish-speaking physician). We also assessed participants’ age, race/ethnicity, gender, education, site of care, and treating physician.

2.3. Data analysis

We assessed the separate associations of HL and then language concordance with the 3 communication items using χ^2 . We then created 3 multivariable models to assess the effect of HL and language on the communication items after adjusting for participant characteristics, site of care, and clustering by physician. The first model included HL but

excluded language concordance. The second model included language concordance but excluded HL. The third model included both HL and language. To assess interactions between HL and language concordance on patient–physician communication, we added a HL–language concordance interaction term to the adjusted regression model that included both HL and language. A P for interaction value = 0.10 was considered significant. Finally, we stratified the communication outcomes by HL and language concordance.

3. Results

Seven hundred and seventy one patients participated. The mean age was 56 years, 58% were women, 50% were Latino, 49% had less than a high school education, 51% had limited HL, 53% were English-speaking, 23% were Spanish-concordant, 24% were Spanish-discordant (Table 1). The participants were cared for by a total of 224 doctors who cared for a mean of 3 participants each. Of the 771 participants, 30% reported poor receptive communication, 28% poor proactive communication, and 56% poor interactive communication.

In bivariate analyses, participants with limited HL (Fig. 1) and Spanish-discordance (Fig. 2) were more likely than participants with adequate HL or English-speakers to report poor communication across all three types of communication ($P < .001$ for all associations).

In the first multivariable model that included HL but excluded language concordance, participants with limited HL were more likely than those with adequate HL to report poor communication for all three communication types (poor receptive communication OR 1.97; 95% CI, 1.33–2.98; poor proactive communication OR 1.93; 95% CI, 1.30–2.85; and poor interactive communication OR 1.60; 95% CI, 1.13–2.27) (Table 2). In the second multivariable model that included language concordance but excluded HL, compared to English-speakers, Spanish-discordant participants were more likely to report poor proactive communication (OR 2.44; 95% CI, 1.55–3.84), and both Spanish-concordant and discordant participants were more likely to report poor interactive communication (OR 1.7; 95% CI, 1.12–2.59 and OR 3.60; 95% CI, 2.27–5.70, respectively).

In the third multivariable model that included both HL and language concordance, compared to those with adequate HL, participants with limited HL were more likely to report poor receptive communication (OR 1.95; 95% CI, 1.31–2.90) and poor proactive communication (OR 1.82; 95% CI 1.22–2.72). Compared to English-speakers, Spanish-concordant and discordant participants were more likely to report poor interactive communication (OR 1.59; 95% CI, 1.04–2.44 and OR 3.37; 95% CI, 2.12–5.37, respectively). Spanish-discordant participants were also more likely to report poor proactive communication (OR 2.21; 95% CI, 1.39–3.52). For receptive communication, P for interaction between HL and language on patient–physician communication was 0.10. For proactive and interactive communication, although similar interaction trends between HL and language were observed, P for interaction was non-significant.

In stratified analysis (Table 3), 131 of 412 (32%) English-speakers had limited HL, 131 of 176 (74%) Spanish-concordant participants had limited HL, and 129 of 183 (70%) Spanish-discordant participants had limited HL. English-speakers with limited HL were more likely to report poor receptive and proactive communication compared to English-speakers with

adequate HL, $P < .05$ (Table 3). Spanish-concordant participants with limited HL were more likely to report poor proactive and interactive communication compared to Spanish-concordant participants with adequate HL, $P < .05$. However, Spanish-discordant participants of both HL levels were equally likely to report the highest prevalence of poor communication in all three domains.

4. Discussion and conclusion

4.1. Discussion

Nearly one-third of outpatients with chronic disease who are cared for in safety net settings reported poor receptive (unidirectional – physician to patient) and proactive (unidirectional – patient to physician) communication, and over one half reported poor interactive, bidirectional communication. Both limited HL and limited English proficiency, when assessed separately, were associated with participant reports of poor communication in all three domains. However, analyses assessing HL and language in combination revealed a more complex picture.

In settings with high interpreter availability, the effects of limited HL on patient–physician communication varied with patient–physician language concordance and by communication type. In multivariable analysis, limited HL was associated with poor receptive and proactive communication, while limited English proficiency was consistently associated with poor interactive communication. Stratified results suggest that among English-speakers, limited HL is a potent barrier to receptive and proactive patient–physician communication, but adequate HL may be able to facilitate good communication. Among Spanish-concordant participants, limited HL remains a barrier to proactive and interactive communication, but adequate HL may also be able to facilitate good communication with Spanish-speaking physicians. In contrast, among Spanish-speaking patients with Spanish-discordant clinicians, adequate HL was unable to compensate for the poor communication across all three types of communication. These results suggest that adequate HL may be able to act as a buffer against poor patient–physician communication when patients and physicians speak the same language. However, when patients and physicians do not speak the same language, adequate HL cannot act as a buffer, even in the presence of a professional interpreter.

Our results build on prior research describing the effects of HL and language barriers on patient–physician communication. Prior studies have also found that limited HL is associated with poor understanding of physician to patient (receptive) communication, leading to impaired patient comprehension [6,22]. Our results suggest that, for English speakers, decreasing the HL demands of health information by reducing medical jargon may mitigate disparities in receptive communication. The lack of HL-related differences in receptive communication for Spanish-concordant patients suggests that Spanish-concordant clinicians may be using less technical, and more conversational, “everyday” language than they do when communicating with English-speakers. Similarly, prior studies among English-speakers have demonstrated that limited HL is associated with less proactive communication (e.g. question-asking) in the medical encounter [7]. Our results not only confirm this relationship, but extend this finding to encounters among Spanish concordant patient–physician dyads.

While reports of poor interactive communication were common in this sample, they were more common among Spanish-speakers. In interpreter-mediated encounters, prior studies have demonstrated that physicians are less likely to engage in interactive, “patient-centered” communication with patients who are Spanish-speaking [8,23]. The high frequency of reports of poor interactive communication among Spanish-concordant participants with limited HL (62%) is a novel finding. It is possible that Spanish-concordant physicians focus time and effort on providing clear explanations to Spanish-speaking patients with limited HL, at the expense of engaging in more interactive conversations. It is also possible that the degree of fluency among Spanish-concordant physicians was not complete. Less Spanish-fluent physicians may have been less able to engage patients with limited HL (patients who are already less proactive) in more interactive conversations [24,25].

Spanish-discordant participants reported the worst communication in all domains, and adequate HL was unable to compensate for limited English proficiency. The findings regarding the untoward effects of language discordance on communication, and interactive communication in particular, have been observed in prior research [8,26–28]. While we hypothesized that we would observe a synergistic effect between Spanish language discordance and limited HL, in fact we observed little variation in the frequency of poor communication across HL levels for this subgroup. This could be a result of the ‘floor effect’ (overall communication was poor for the entire Spanish discordant subgroup) or could suggest that interpreters, while not a panacea, level the playing field with respect to HL and verbal communication among Spanish discordant patient–physician dyads.

While, to our knowledge, this is the first study to simultaneously examine the influence of language and HL on patient–physician communication, the study does have a number of limitations. Recall bias may have been introduced as we used self-reported information. However, our results are consistent with prior research that has studied HL and language separately using direct observation [6,7,22,23]. The validity of our measures may be somewhat compromised as we used a subset of the IPC instrument; however, a similar set of items is currently being used by the U.S. government and accreditation organizations to assess healthcare quality [29]. We did not have information on the use of interpreters, the race/ethnicity concordance, or physician’s language skill across all 3 sites, which may have contributed to unmeasured confounding [30,31]. Also, the study may not be generalizable to patients in other settings or who speak other languages.

4.2. Conclusion

In safety net clinical settings with high interpreter availability, patient reports of poor receptive, proactive, and especially interactive communication were high. Both limited HL and limited English proficiency, when assessed separately, were associated with poor communication across all three communication types. The negative effect of limited HL on patient–physician communication, however, varied with patients’ primary language, the presence of a language concordant physician, and the type of communication. Among language concordant patient–physician dyads, adequate HL may facilitate good communication for English speakers and act as a buffer against poor communication for patients with limited English proficiency. For patients whose physicians speak their same

language, communication interventions may need to focus on HL. However, among language discordant dyads, patient–physician communication is the most profoundly impaired. Furthermore, HL skill does not appear to be able to act as a buffer against poor patient–physician communication. These results suggest that among language discordant dyads, language barriers may supersede the effects of HL in impeding patient–physician communication and communication interventions should focus on language.

4.3. Practice implications

Clinicians should recognize that limited HL and limited English proficiency are communication barriers that frequently co-exist. Designing interventions for vulnerable populations focused solely on HL or language may not be sufficient to improve both unidirectional and interactive communication. Using clear communication and decreasing the HL demands on patients may help with receptive communication for all groups. This can be achieved through the use of techniques such as ‘teach-back’ and by reducing the use of medical jargon [6,22,32]. For many patients, and particularly those with limited English proficiency, these techniques may not be enough to improve interactive communication.

Clinicians who are language concordant should continue to provide clear explanations and enable patient participation; however, greater efforts may be needed to ensure bidirectional forms of interaction that reflect more genuine clinical conversation. This may be particularly relevant for language concordant physicians who are not completely fluent or who may not be as familiar with the patient’s culture or national origin. For clinicians who are language discordant, and the interpreters who are assisting them, health systems may need to provide additional resources, such as time, to enable the kinds of interactions that can lead to successful communication. Additional research that includes patients, clinicians, and health systems and that also takes into account language barriers, HL levels, patient–physician language concordance, and the role and influence of interpreters is needed. Health professional schools should also consider recruiting more Spanish-speaking and Latino applicants to meet the linguistic needs of the U.S. population.

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Fig. 1.
Percentage of participants reporting poor patient–physician communication by literacy level.

Fig. 2.
Percentage of participants reporting poor patient–physician communication by language category.

Table 1Participant characteristics, $n = 771^a$.

	Percentage or mean ($\pm$ SD)
Age	56 years (± 12)
Women	58
Race/ethnicity	
White, Non-Hispanic	12
White, Hispanic (Latino)	50
Black, Non-Hispanic	27
Asian	8
Multi-racial/ethnic, other	3
Education: <high school education	49
Language	
English	53
Spanish concordant	23
Spanish discordant	24
Health literacy ^b	
s-TOFHLA score	21 $\pm$ 12
Limited health literacy	51
Hospital site	
San Francisco General Hospital	82
Alameda County Medical Center	18
Primary physicians ($n = 224$) ^c	
Mean number participants cared for	3 participants each (± 1)

^aMissing data: age, $n = 2$; gender, $n = 2$; race/ethnicity, $n = 4$; education, $n = 1$.^bLimited health literacy is defined as a short form Test of Functional Health Literacy in Adults (s-TOFHLA) score ≤ 22 out of 36.^cTwo hundred and twenty-four physicians cared for a mean number of 3 participants each.

Table 2

Multivariate analysis demonstrating the effect of health literacy and language concordance on poor patient–physician communication.

	Poor receptive communication OR (95% CI)	P- <i>1</i> ^a	Poor proactive communication OR (95% CI)	P- <i>1</i> ^a	Poor interactive communication OR (95% CI)	P- <i>1</i> ^a
Multivariate models ^b						
Including health literacy (referent group: adequate health literacy)						
Limited health literacy	1.97 (1.33–2.89)		1.93 (1.30–2.85)		1.60 (1.13–2.27)	
Including language (referent group: English-speakers)						
Spanish concordant	1.02 (0.63–1.64)		1.18 (0.73–1.93)		1.70 (1.12–2.59)	
Spanish discordant	1.51 (0.96–2.38)		2.44 (1.55–3.84)		3.60 (2.27–5.70)	
Including both health literacy and language (referent groups: adequate health literacy and English-speakers)						
Limited health literacy	1.95 (1.31–2.90)	.10	1.82 (1.22–2.72)	.38	1.40 (0.98–2.00)	.23
Spanish concordant	0.89 (0.54–1.45)		1.06 (0.64–1.74)		1.59 (1.04–2.44)	
Spanish discordant	1.33 (0.84–2.12)		2.21 (1.39–3.52)		3.37 (2.12–5.37)	

^a *P* for interaction created by including a health literacy and language interaction term to the adjusted multivariate logistic regression models. A *P* for interaction value 0.10 was considered significant.

^b Adjusted for age, race, gender, education, site, and clustered by physician. In the first model only health literacy was included and language concordance was excluded. In the second model, only language concordance was included and health literacy was excluded. In the third model, both health literacy and language concordance were included.

Stratified analyses demonstrating the effects of health literacy on poor patient–physician communication for each language category.

Table 3

	Poor receptive communication			Poor proactive communication			Poor interactive communication		
	By health literacy level			By health literacy level			By health literacy level		
	Adequate (%)	Limited (%)	P	Adequate (%)	Limited (%)	P	Adequate (%)	Limited (%)	P
Language category									
English (n = 412)	21	34	.003	18	27	.03	47	49	.76
Spanish concordant (n = 176)	20	29	.24	11	30	.01	44	62	.05
Spanish discordant (n = 183)	46	41	.55	41	48	.34	67	76	.16