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Health Literacy and Pap Testing in Insured Women

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Abstract

Several studies have found a link between health literacy and participation in cancer screening. Most, however, have relied on self-report to determine screening status. Further, until now, health literacy measures have assessed print literacy only. The purpose of this study was to examine the relationship between participation in cervical cancer screening (Papanicolaou [Pap] testing) and two forms of health literacy – *reading* and *listening*. A demographically diverse sample was recruited from a pool of insured women in Georgia, Massachusetts, Hawaii and Colorado between June 2009 and April 2010. Health literacy was assessed using the Cancer Message Literacy Test-*Listening* and the Cancer Message Literacy Test-*Reading*. Adherence to cervical cancer screening was ascertained through electronic administrative data on Pap test utilization. The relationship between health literacy and adherence to evidence-based recommendations for Pap testing was examined using multivariate logistic regression models. Data from 527 women aged 40 to 65 were analyzed and are reported here. Of these 527 women, 397 (75%) were up to date with Pap testing. Higher health literacy scores for *listening* but not *reading* predicted being up to date. The fact that health literacy *listening* was associated with screening behavior even in this insured population suggests that it has independent effects beyond those of access to care. Patients who have difficulty understanding spoken recommendations about cancer screening may be at risk for underutilizing screening as a result.

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Keywords

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Introduction

Health literacy, “the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions” [1], has been found to be associated with health outcomes ranging from use of preventive services [2] to mortality [3]. A recent systematic review on health literacy and health outcomes documented several important associations between health literacy and cancer screening [4]. Of particular relevance were three studies suggesting an association between health literacy and cervical cancer screening using (Papanicolaou [Pap] testing) [5-7]. However, these studies were limited by their reliance on self-reported screening use, and their focus on print literacy only. The focus on print literacy is an important gap since spoken messages from physicians are an important source of information and a major influence on cancer screening decisions [8,9]. Patients who have difficulty understanding spoken recommendations about cancer screening and other preventive behaviors may also be at risk for lower rates of screening.

The current study sought to extend understanding of the relationship between health literacy and cancer screening by examining the association between two aspects of health literacy – listening literacy as well as reading literacy - and recent Pap testing in a diverse sample of insured women.

Methods

Setting

This study was conducted within the Cancer Research Network (CRN), a consortium of research organizations affiliated with non-profit integrated healthcare delivery systems, funded by the National Cancer Institute. Four CRN sites participated: Kaiser Permanente Georgia (KPGA), Kaiser Permanente Hawaii (KPHI), Kaiser Permanente Colorado (KPCO) and Fallon Community Health Plan (FCHP) in Massachusetts. The study was approved by the Institutional Review Boards at each of the sites.

Sample

Potential participants were identified from health system records by randomly sampling members aged 40-70 years who had been enrolled for at least five years; only women aged 40 to 65 were included in the present study. To optimize sampling across educational levels, at FCHP, KPGA and KPHI sampling was stratified by United States Census-based estimates of educational level. At KPGA, sampling was further stratified by race to ensure that African-American and white members were invited in equal numbers within each educational strata. At KPCO, only Hispanic members self-identifying as Latino, with English as their preferred language were recruited. Detailed information on the sample and study procedures have been published previously [10].

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Procedures

Study sessions lasted approximately 2 hours and were conducted in-person by a trained research assistant. Participants provided written informed consent including permission to access electronic health records and received $50 for participation.

Measures

The Cancer Message Literacy Test (CMLT)-*Listening* is a health literacy measure which assesses comprehension of spoken messages related to cancer prevention and screening. The CMLT-*Reading* is a companion measure which assesses comprehension of written messages. Test development and psychometric properties of these two instruments are described elsewhere [10, 11].

Pap Test Utilization

Women included in the present study had valid clinical data, had not reported a history of cervical cancer, and were aged 40 to 65 years. This age range was selected to be consistent with the most conservative age recommendations of existing clinical practice guidelines. Following health plan guidelines in effect at the time of the 2009 interview, the screening interval for the current study for Pap screening was defined as 3 years. For each study-eligible woman, the dates of all completed Pap tests occurring during the five year period preceding the interview date were extracted from electronic records. A dichotomous variable was constructed and coded 1 if the electronic record indicated that the participant had had *Pap testing within the 39 months prior to the study session*, 0 otherwise. The 39 month interval was used to provide a conservative approximation of a three year interval allowing for lags of administrative data processing.

Analyses

Logistic regression analysis was used to examine the relationship between health literacy and Pap screening status, adjusting for site and age. The contribution of the two health literacy scores (CMLT-*Listening* and CMLT-*Reading*) was evaluated separately. Analyses were conducted using SPSS version 20.0 and SAS version 9.2.

Results

Approximately 45 percent (n=241) of the women in this study had at least a bachelor's degree. Forty-two percent (n=222) reported their race as white, non-Hispanic; percent reporting membership in other racial or ethnic categories were as follows: 18% African-American (n=92); 14% Asian or Pacific Islander (n=74); 18% Hispanic (n=97); and 7% other or multiple categories (n=36) identified. The mean percent correct score for the women in this sample on the CMLT-*Listening* was 79.1 (standard deviation=13.7; maximum possible score =100); the mean percent correct CMLT-*Reading* score was 84.0 (standard deviation=14.1; maximum possible score =100). Pap screening rates were relatively high overall; 75% (n=397) of the women in these analyses had had a Pap test within the prior 39 months; rates ranged from 65% to 83% across sites.

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Logistic regression analysis results are presented in Table 1. The CMLT-*Listening* was predictive of Pap testing status; women with higher health literacy scores on the CMLT-*Listening* were more likely to have had Pap testing within the past 3 years compared to women with lower scores, after adjusting for site and age. The raw, unadjusted rates of Pap test utilization similarly increased across score quartiles for the CMLT-*Reading*, but the relationship between CMLT-*Reading* score and screening status was not statistically significant.

Discussion

In this study of screening status in insured women from four sites across the U.S., we found a statistically significant association between health literacy and cervical cancer screening; women with higher health literacy were more likely to have had a recent Pap test. Importantly, this association was limited to health literacy with respect to spoken information (as measured by the CMLT-*Listening*); Pap test utilization was not associated with written health literacy (measured by the CMLT-*Reading*). These findings suggest that spoken health literacy may be a more sensitive indicator or important determinant of health behavior than written literacy.

Our findings are also notable because they suggest that health literacy may have effects beyond those of other known determinants of screening utilization, such as health insurance and access to care [12-14]. Our study population was insured and had access to preventive health services, and overall Pap test utilization was accordingly high. The fact that spoken health literacy was associated with screening behavior even in this population suggests that it has independent effects beyond those of access to care.

Study strengths include our assessment of literacy with respect to both print and spoken health messages, using instruments which focus specifically on cancer prevention and screening, and which have good psychometric properties [10, 11]. Our use of health plan records to determine screening status avoided reliance on self-report. However, this study does have limitations. The fact that the women in this study were all members of integrated healthcare delivery systems limits our ability to generalize these findings to women in other systems. Further, the women in this study were volunteers, who may differ in important ways from women who did not participate, which could also limit generalizability.

Conclusion

These findings highlight the importance of considering the spoken literacy level of educational messages, and their match to the intended target audience in designing educational materials to promote cancer screening. Health educators and clinicians should be aware that women may have difficulty understanding spoken recommendations about cancer screening. Avoiding jargon, checking for understanding using the teach back technique, and providing supplemental written information that patients can bring home and review with others may all help to improve understanding and avoid confusion [15]. Additional study is needed to determine whether these approaches or others lead to actual improvements in cancer screening rates.

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Table 1

Logistic Regression Results Predicting Pap Test Utilization Status from Health Literacy Scores

	CMLT*-*Listening*			CMLT*-*Reading*		
	Percent with Recent Pap Test (unadjusted)	**Adjusted Odds Ratio**	**95% Confidence Intervals**	**Percent with Recent Pap Test (unadjusted)**	**Adjusted Odds Ratio**	**95% Confidence Intervals**
Top Quartile	**83**	**2.00**	**1.09; 3.66**	80	1.61	.80; 3.24
3rd Quartile	78	1.59	.90; 2.80	80	1.66	.97; 2.86
2nd Quartile	75	1.36	.77; 2.38	74	1.16	.67; 2.00
Bottom Quartile	70	Reference		71	Reference	

Table notes: Adjusted odds ratios are adjusted for age (in years) and site. Tests for trends were statistically significant.

*CMLT – Cancer Message Literacy Test.