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Letter

Predictors of human papillomavirus awareness and knowledge in 2013: The Importance of health literacy.

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The recent article by Blake et al.[1] highlights the important gaps in awareness and knowledge about human papillomavirus (HPV), its relationship with cancer, and the HPV vaccine in the U.S. population. As noted by the authors, the introduction of a health technology can lead to health inequalities if there is differential learning among population subgroups, the so-called "Knowledge Gap Hypothesis." Comparisons with previous analyses of the Health Information and National Trends Survey (HINTS) suggest awareness has increased among the U.S. population since 2005, but disparities persist.[2]

An important factor not considered in Blake and colleagues' analysis[1] is health literacy, defined by the IOM as "the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions."[3] As such, limited health literacy could adversely affect one's likelihood of being informed about topics such as HPV and HPV vaccination. Approximately one in three American adults has inadequate health literacy skills, and this is more common among older adults, those from ethnic minority backgrounds, those with low income, and those with fewer years of education.[4] Despite these associations, health literacy often emerges as an independent predictor of cancer-related knowledge after controlling for markers of socioeconomic deprivation.[5]

HINTS 4 Cycle 3 is the first iteration of the survey to include a short form version of an established health literacy tool known as the Newest Vital Sign.[6] Respondents are required to answer four literacy and numeracy questions after viewing a nutritional label on a food container. In the HINTS data, one third of respondents (34%, 95% CI=31%, 36%) incorrectly answered two items, which closely mirrors other national estimates for limited health literacy.[4] Univariable analyses indicated that people with limited health literacy were less aware of HPV (p<0.001) and the HPV vaccine (p<0.001), and had less knowledge of its link with cervical cancer (p<0.001), its sexually transmitted nature (p<0.001), and its potential to

be transient (p=0.002) (Table 1). After controlling for all variables in the Blake et al. analysis,[1] significant associations with health literacy remained with three of the five items: awareness of HPV (OR=0.54, 95% CI=0.37, 0.79), awareness of the HPV vaccine (OR=0.57, 95% CI=0.37, 0.87), and correct knowledge that HPV can cause cervical cancer (OR=0.49, 95% CI=0.32, 0.76). Marginal attenuation of the effects of education was observed, suggesting both contribute independently to comprehension (data not shown).

These analyses provide an additional population subgroup where social patterning of HPV-related awareness and knowledge exists. Policymakers devising communication strategies to promote HPV-related knowledge should be mindful of the high prevalence of limited health literacy in the population, and tailor campaigns accordingly. We concur with Blake and colleagues'[1] suggestion for improved patient–provider discussions about this topic, but encourage clinicians to be aware of effective techniques for communicating complex information with low-literacy groups.[7] Addressing knowledge gaps is an importance aspect of cancer prevention and control, and attempts to address health literacy disparities should form a part of this challenge.

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Table 1. Weighted Unadjusted and Adjusted Estimates for HPV Awareness and Knowledge by Health Literacy

	Unadjusted estimates (*n*=3,165)		**Fully adjusted analyses**		
	Health literacy level n (%)			**Health literacy level OR (95% CI) [a]**	
	Limited *n*=1,316	**Adequate *n*=1,849**	**N in analyses**	**Limited**	**Adequate**
Have you ever heard of HPV?			2,191	0.54 (0.37, 0.79)**	Ref
No	655 (52%)	442 (24%)***			
Yes	606 (48%)	1403 (76%)			
Before today, have you ever heard of the cervical cancer vaccine or HPV shot?			2,174	0.57 (0.37, 0.87)*	Ref
No	605 (49%)	443 (24%)***			
Yes	629 (51%)	1393 (76%)			
Do you think HPV can cause cervical cancer?			1,530	0.49 (0.32, 0.76)**	Ref
No	42 (7%)	57 (4%)***			
Unsure	286 (49%)	437 (32%)			
Yes	257 (44%)	892 (64%)			
Do you think that HPV is a sexually transmitted disease?			1,530	0.73 (0.46, 1.17)	Ref
No	122 (21%)	280 (20%)***			
Unsure	198 (34%)	297 (21%)			
Yes	263 (45%)	812 (58%)			
Do you think that HPV will often go away on its own without treatment?			1,528	1.51 (0.54, 4.28)	Ref
No	356 (61%)	932 (67%)***			
Unsure	206 (35%)	381 (28%)			
Yes	21 (4%)	71 (5%)			

[a] Adjusted for sex, age, education, race, Hispanic ethnicity, no. of children <18 years in household, income, metropolitan area, insurance, and Internet use. Items reflect awareness/correct knowledge.
Note: Boldface indicates statistical significance (*p<0.05; **p<0.01; ***p<0.001).
HPV, human papillomavirus.
Total n is 3,165 as 20 participants received a short form questionnaire not including the health literacy assessment. Numbers may not sum to 3,165 due to missing values.