Inadequate Health Numeracy Affects Cancer Screening Practices in Vulnerable Populations

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Abstract:
Introduction: The relationship of health numeracy (HN), an element of health literacy, to cancer screening practices remains unclear. In response, this study aims to answer two questions: 1) Is HN associated with colorectal cancer screening (CRCs) and Cervical Cancer Screening (CVCS)? 2) Do these associations vary across joint categories of race/ethnicity, gender, and educational level? Methods: This study used the Health Information National Trends Survey (HINTS 2007), a nationally representative survey of American adults (n=7264). CRCS and CVCS were dichotomous variables (1= adherence to age-specific guidelines; 2= non-adherence). HN was also dichotomous (1= very easy/easy to understand medical statistics; 2= difficult/very difficult). Contingency table methods using PASW 18.0, generated odds ratios (OR) with 95% confidence intervals (95% CI). Unweighted analyses are reported. Results: Inadequate HN (or IHN; HN code =1) was associated with CRCS non-adherence (OR=1.13; 95% CI [1.01,1.27]). In subgroup analysis, this association persisted only among Hispanic males with less than a high-school (HS) education (OR=3.10; 95% CI [1.01,9.48]). IHN was globally associated with CVCS (OR=1.39; 95% CI [1.20,1.60]); this association persisted only among Hispanic males with less than a HS education (OR=1.48; 95% CI [1.14,1.92]). Conclusions: Preliminary analyses suggest that HN influences cancer screening non-adherence, particularly among certain population subgroups. Ideally, these subgroups would receive interventions designed to raise HN, ultimately leading to earlier cancer detection.

Methods:
- Data source: Health Information National Trends Survey (HINTS 2007)
- Eligible population: Those without history of cancer (n=3442)
- Dependent variables:
  - CRCS adherence to guidelines (1=yes, 2=no).
  - CVCS adherence to guidelines (1=yes, 2=no).
- Independent variable: HN
  - Comfort with medical statistics (1=very easy/easy to understand medical statistics; 2=difficult/very difficult).
  - Education level (1=less than or equal to HS, 2=more than HS).
- Effect modifiers:
  - Race/ethnicity (1=White, 2=Black, 3=Hispanic).
  - Education level (1=Less than or equal to HS, 2=More than HS)
- Statistical analysis:
  - Analyses of valid cases included stratified crude and age-adjusted odds ratios (OR) with 95% confidence intervals (95% CI).
  - Analyses were unweighted and executed using SPSS 15.0 and PASW 18.0 (SPSS, Inc., Chicago, IL).

Results:
Table 1. Overall and Subgroup Age-Adjusted Odds Ratios of CRC Screening Non-Adherence, HINTS 2007.

Table 2. Overall and Subgroup Age-Adjusted Odds Ratios of CVS Screening Non-Adherence, HINTS 2007.

Conclusions:
- Preliminary, HN influences cancer screening non-adherence within certain population sub-groups.
- If current findings hold true, new pathways linking these variables have been discovered.

Recommendation:
- Confirmatory analyses are needed, using other measures of HN available in HINTS, weighted data, and adjustment for other background variables besides age.