



The Missing Links: Health Literacy and Cognitive Function in the Treatment of Head and Neck Cancer



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Introduction

- Health Literacy:**
 - Degree to which a person has “*the capacity to obtain, process, and understand basic information and services needed to make decisions about their health care*”¹
 - Poor health literacy is associated with:
 - Difficulties managing medications and adhering to medications
 - Assessing and evaluating health information
 - Comparing nutritional information
 - Poor adherence to medical treatment
 - Poor quality of life and self-rated health status
 - Higher hospital utilization and healthcare costs
 - Higher all-cause mortality
 - While the Joint Commission recommends patient-education materials be written at less than a 5th grade level, recent studies have found that most materials are written at 11-12th grade level, even from organizations such as NCI and NIH online²
- Cognitive Function:**
 - Contributes to one’s health literacy, though also independently contributes to adherence
 - Cognitive function is associated with:
 - Substance use (alcohol, tobacco, drugs)
 - Psychiatric symptoms/diagnoses (depression, anxiety)
 - Quality of life
 - Treatment adherence
 - Treatment for head and neck cancer requires complex, often multimodal care
 - Cognitive function and health literacy in patients with head and neck cancers has been found to be lower than the general population
 - Estimates of 12-30% have inadequate or marginal health literacy³ compared to 14% of general population⁴
 - This study examines the interaction between cognitive function and health literacy in patients with head and neck cancer receiving either definitive or adjuvant radiation or chemoradiation treatment.**

Methods

- All new patients to the Department of Otolaryngology – Head & Neck Surgery were administered the Montreal Cognitive Assessment (MoCA) and the Rapid Evaluation of Adult Medical Literacy (REALM-SF) by the Health Psychologist within the Department
- MoCA is a brief screening tool for cognitive assessment that takes 5 mins to administer
 - Score ≥ 26 = “normal/unimpaired”, 18-25 = mild cognitive impairment (MCI), 10-17 = moderate cognitive impairment, < 10 = severe cognitive impairment
 - Alzheimer’s Disease mean score 16 (range 11-21), MCI mean score 22 (19-25)

Methods

- REALM-SF is a word recognition test of 7 common medical terms that takes 1-2 mins to administer
 - 0 = 3rd grade or below (need repeated oral instructions, illustrative materials, audio/video tapes), 1-3 = 4th-6th grade (need low-literacy materials, may not be able to read prescription labels), 4-6 = 7th-8th grade (will struggle with most patient education materials, will likely need low-literacy materials), 7 = high school (able to read most patient education materials)
 - Adequate health literacy was defined at REALM ≥ 6 for this study
- Treatment adherence was defined as unplanned breaks in treatment or elective non-completion of prescribed radiation or chemotherapy dose
- Demographic, disease specific, and adherence data was gathered via retrospective review
- Patients with data for both the MoCA and REALM from August 2017 to September 2020 receiving definitive or adjuvant radiation or chemoradiation were included

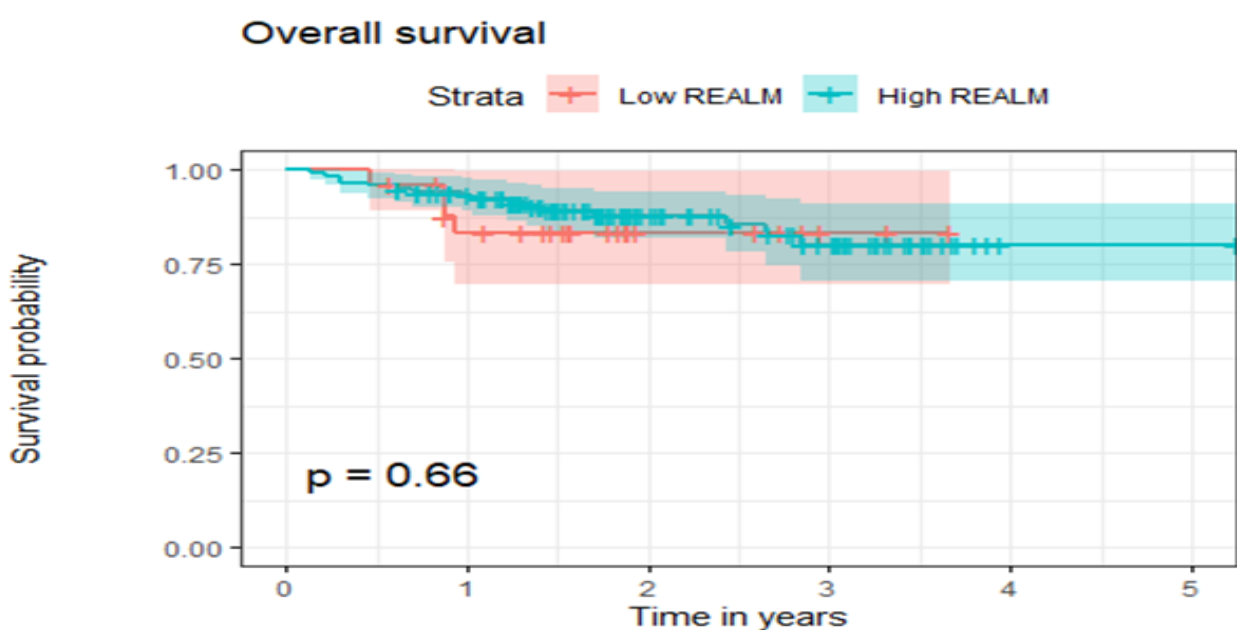
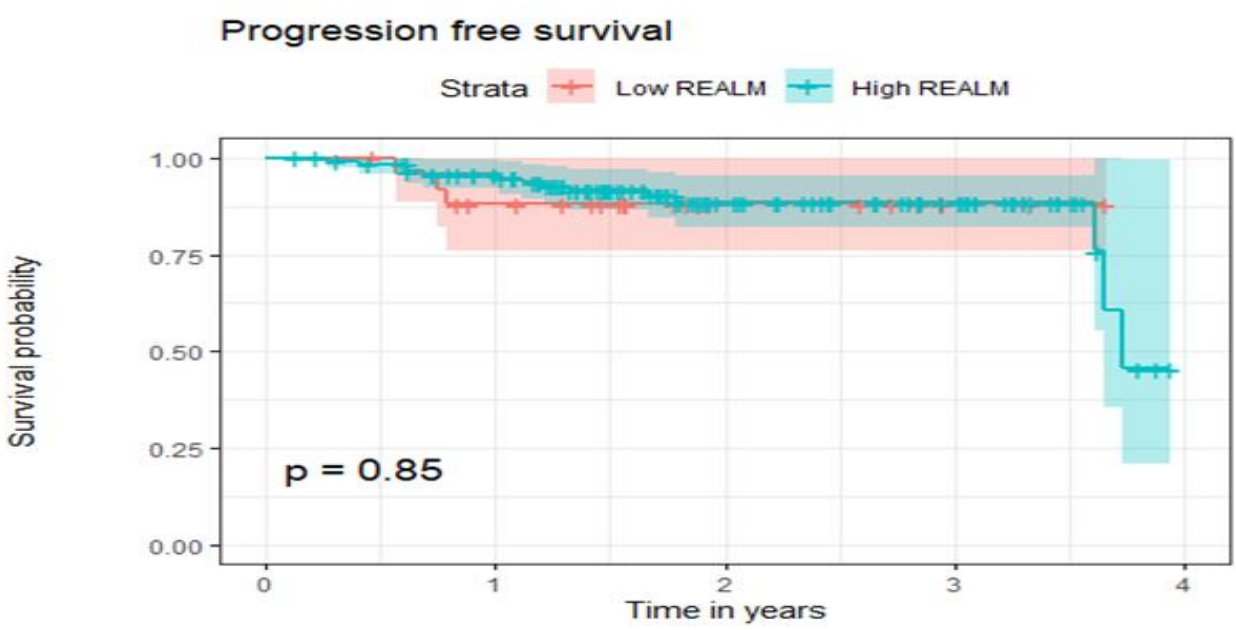
Results

	Total (N=148)	Inadequate literacy (n=26)	Adequate literacy (n=122)	P-value
Age (years), mean ($\pm$ SD)	62.1 (9.1)	63.9 (8.2)	61.7 (9.3)	0.27
Gender	Male, n (%)	116 (78.4)	18 (69.2)	0.32
	Female, n (%)	32 (21.6)	8 (30.8)	
Race/Ethnicity	White, n (%)	105 (72.9)	9 (34.6)	<0.001
	Black, n (%)	37 (25.7)	17 (65.4)	
	Hispanic, n (%)	2 (1.4)	0 (0.0)	
Education (years), mean ($\pm$ SD)	13.6 (2.6)	11.9 (2.4)	14.0 (2.5)	<0.001
Marital status	Married/partnered, n (%)	115 (77.7)	18 (69.2)	0.38
	Divorced/widowed/single, n (%)	33 (22.3)	8 (30.8)	
Vital status	Deceased, n (%)	20 (13.5)	4 (15.4)	0.99
	Alive, n (%)	128 (86.5)	22 (84.6)	
Stage	Early (I-II), n (%)	88 (61.5)	12 (48.0)	0.19
	Late (III-IVb), n (%)	55 (38.5)	13 (52.0)	
MoCA Score, mean ($\pm$ SD)	23.8 (3.6)	21.3 (3.6)	24.4 (3.3)	< 0.001
	≥ 26 , n (%)	46 (31.1)	3 (11.5)	<0.001
	18-25, n (%)	92 (62.2)	17 (65.4)	
	10-17, n (%)	9 (6.1)	6 (23.1)	
Treatment Adherence	< 10 , n (%)	1 (0.7)	0 (0.0)	
	No, n (%)	24 (16.2)	3 (11.5)	0.67
	Yes, n (%)	124 (83.8)	23 (88.5)	

* Chi-square test for categorical variables, and t-test for continuous variables

Results

- Adequate health literacy was associated with race, education, and cognitive function
 - REALM score was positively correlated with MoCA score ($r=0.41$, $p<0.001$)
- Median follow-up was 1.81 years
- Health literacy was not associated with progression-free or overall survival
 - 1-year progression-free survival probability 0.99 (95% CI 0.76-1) vs 0.96 (95% CI 0.92-0.99), $p=0.85$
 - 1-year overall survival probability 0.83 (95% CI 0.70-1.00) vs 0.93 (95% CI 0.89-0.98), $p=0.66$



Conclusions/Discussion

- The current study found that, while health literacy was not associated with treatment adherence or survival, adequate health literacy was associated with race/ethnicity, education, and overall cognitive function
- However, adequate health literacy in this study was defined as reading at 7th grade level. This is well below the average literacy level of most patient-education materials in prior research, which found an average literacy level of 10-11th grade for these materials
- The current study is limited by the length of follow up to determine survival, as well as the definition of treatment adherence
- Future research should examine associations between pre-treatment cognitive function and literacy and engaging in the treatments recommended by Tumor Board, as well as the psychosocial confounds previously associated with treatment outcomes (e.g., social support, substance abuse, quality of life)
- The current study argues for further examination of the incorporation of cognitive and health literacy screening as part of pre-treatment evaluation for patients with head and neck cancer and how these variables interact with other psychosocial variables to influence treatment outcomes and areas of intervention to impact these outcomes

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