COGNITIVE DYSFUNCTION AND THE 25-ITEM NATIONAL EYE INSTITUTE VISUAL FUNCTION QUESTIONNAIRE

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RESEARCH QUESTION

Do elderly individuals (ages 65 and above) with cognitive dysfunction have decreased self-reported visual function (quantified by overall NEI VFQ composite score) compared to elderly individuals with normal cognition?

The goal of this study is to characterize the relationship between cognition (based on MMSE score) and self-reported visual function (based on NEI VFQ-25 score), and to examine the relationship between clinical neuropsychological diagnosis (i.e., normal cognition, MCI, AD) and self-reported visual function.

BACKGROUND

Cognitive dysfunction and visual impairment often coexist in the elderly population. Decreased visual function is a significant burden for these individuals and can lead to disability and decreased quality of life. Furthermore, visual impairment is associated with an increased risk of Alzheimer's disease (AD) as well as an increased clinical severity of AD. Although visual function and cognitive impairment are interrelated, little is known about the impact of modifying treatable vision impairment on the development and progression of cognitive dysfunction. This study examines the relationship between cognition and self-reported visual function using the National Eye Institute's Visual Function Questionnaire (NEI VFQ).

METHODS

The research cohort was recruited from the Alzheimer's Disease in Primary Care (ADPC) study at UNTHSC. The participants completed the Mini-Mental State Examination (MMSE) for assessment of cognition, as well as the National Eye Institute's Visual Function Questionnaire (NEI VFQ) to assess self-reported visual function. Additionally, as a part of the ongoing ADPC study, participants underwent rigorous neuropsychological testing and were assigned a clinical consensus diagnosis based on established criteria. Statistical analyses of the data included a general linear model and an analysis of variance approach to compare means between multiple groups.

- **Reduced visual function should raise concern for cognitive decline and prompt additional assessment.**
- **Questionnaires like the NEI VFQ can identify correctable causes of reduced visual function and thus patients who may benefit from ophthalmic interventions.**
- **Our data suggest that these interventions may improve health-related quality of life, which, in turn, can potentially impact cognitive outcomes.**

Publication

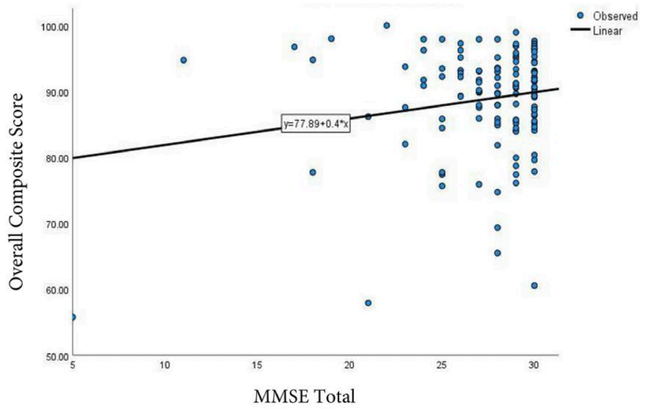

FIGURE 1 The overall composite score on the NEI VFQ 25 and total MMSE score (unadjusted analysis). NEI VFQ-25, National Eye Institute 25-Item Visual Function Questionnaire; MMSE, Mini-Mental State Examination

RESULTS

TABLE 1 Descriptive statistics for overall sample

Variable	*n* (%)
Sex	
Female	84 (64.12%)
Male	47 (35.88%)
Race	
Non-Hispanic White	97 (74.05%)
Hispanic	12 (9.16%)
Asian	3 (2.29%)
Black/African American	19 (14.50%)
Disease classification	
No glaucoma, cataract, AMD	79 (60.31%)
Glaucoma	4 (3.05%)
Cataract	37 (28.24%)
Age-related macular degeneration	5 (3.82%)
2 or more	6 (4.58%)
Clinical classification	
Pre-clinical or normal	80 (61.07%)
Mild cognitive impairment	35 (26.72%)
Dementia	16 (12.21%)
Age	
	Mean (SD)
	71.63 (5.51)

Abbreviation: AMD, age-related macular degeneration.

Data analysis revealed a statistically significant association between participants' overall composite score on the NEI VFQ and their total MMSE score (P = 0.04). On average, for every 1-point increase in MMSE score, the overall composite NEI VFQ score increased by 0.40 units (95% confidence interval [CI]: 0.0266–0.7718).

FUTURE DIRECTIONS

Future longitudinal studies will focus on the relationship between domain-specific neuropsychological testing and visual function, as well as examine the impact of biomarker status on visual function.

A future application of the study results could assess the impact of intervention on the relationship between cognition and visual function. That is, does treatment and subsequent improvement of age-related ocular conditions lead to improvement in cognition?

ACKNOWLEDGEMENTS: The Alzheimer's Disease in Primary Care (ADPC) study is an ongoing research investigation (R01AG058537) at the University of North Texas Health Science Center (UNTHSC).