Exploratory Investigation of Cognitive Function, Health and Stroke Literacy, and Health-Promoting Behaviors among Veterans with Stroke Risk Factors

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Introduction

Potentially modifiable health conditions such as Type 2 diabetes mellitus (T2DM), hypertension and dyslipidemia are associated with poorer cognitive functioning and an increased risk of stroke. Few studies have focused on the role of cognition, specifically executive function (EF), health literacy, stroke knowledge and health promoting behaviors among individuals with stroke risk factors.

Purpose

The purpose of the current study was to describe health and stroke literacy, EF, and health-promoting behaviors among Veterans with stroke risk factors. We were interested in knowing whether having stroke risk factors would be associated with (1) lower scores on EF measures and (2) poorer adherence to health-promoting behaviors.

Methods

A pilot cross-sectional study was conducted at a *Northeastern Veterans Affairs Medical Center. Veterans age 45-89 years with stroke* risk factors, without prior history of stroke were evaluated with a comprehensive neuropsychological battery; Controlled Oral Word Association Test (COWAT), Trails A & B and Stroop Color and Word Test. To measure health literacy and knowledge of stroke risk factors participants completed the Short Test of Functional Health Literacy in Adults (STOFHLA) and the Stroke Action Test (STAT). Demographics, functional health and health promoting behaviors were measured using the VA RAND SF-12 and Lifestyle Profile II. Study data were described using univariate summary statistics examining the variables health literacy, stroke knowledge, cognitive function, and health-promoting behaviors. Pearson correlation was used to explore the relationship between stroke risk factors, EF and health promoting behaviors.

Results

- Subjects = 16 (male)

- Mean age of 62.1 years (SD=9.30); High school (100%).

- Cognitive Screen: The Mini Mental State Examination, mean, 28.6; SD = 1.5 (cut score 24)

- Multiple co-morbid stroke risk factors included: hypertension (n = 13, 81.3%), type 2 diabetes (n = 13, 81.3%), dyslipidemia (n = 4, 25%), atrial fibrillation (n = 3, 18.8%), and carotid artery disease (n = 2, 12.5%).

- SF-12 mean score 40.2 for physical health and 39.3 for mental health, which are below the national mean score of 50.

- STOFHLA- mean score of 32.6 (range 23 to 36).

- STAT scores on all 28 items were low, at 15.9%. Participants had difficulty recognizing the correct action to take when experiencing any of the five warning signs of stroke, and 50% (n = 8) did not recall that sudden trouble seeing in one eye and a sudden severe headache with no known cause were warning signs of stroke.

- Correlational analysis of all study variables did not reveals statistical significance however there was a moderately positive relationship between the between health literacy together with a composite score of EF *(r= .538, p<01)* . There was also a moderate relationship between EF, interpersonal relationships and stress management on the HPLP-II (*r=0.591, p<01*) and (*r=-0.553, p<01*).

Table 1: Descriptive Statistics for HPLP-II Subscales

Subscale	Mean (SD)	Range
Total HPLP-II	2.8 (0.56)	1.7–3.8
Health responsibility	3 (0.53)	1.9–4
Interpersonal relations	3.1 (0.70)[a]	1.8–3.9
Nutrition	2.7 (0.46)	1.7–3.3
Physical activity	2.4 (0.70)[b]	1.5–4
Spiritual growth	3.1 (0.79)	1.7–4
Stress management	2.8 (0.73)	1.4–4

Table 2: Executive Function Measures

Subscale	Mean (SD)	Range
COWAT (Form A)	40.8 (±10.42)	21–56
STROOP: word score	78.4 (±17.08)	50–100
STROOP: color score	56.9 (±11.10)	28–75
STROOP: color–word score	58.3 (±22.77)	20–100
Trail Making Test A	54.4 seconds (±28.50)	20–129
Trail Making Test B	108.4 seconds (±82.42)	45–310

Conclusion

Researchers concluded that associations between decline in EF and episodic memory, together with literacy, persisted after adjustment for race and income. These findings suggest that multiple factors contribute to literacy and that aging and cognitive decline, particularly declines in EF and episodic memory, degrade the financial and health literacy older adults most need to maintain well-being. Results of our EF testing suggests that there was some mild cognitive dysfunction among the subjects; however, further in-depth investigation is needed to support these results. These findings also suggest that health care providers should consider cognitive factors linked to these conditions when they counsel patients with stroke risk factors on the benefits of lifestyle change.

References

Alvarez, J. A., & Emory, E. (2006). Executive function and the frontal lobes: a meta-analytic review. *Neuropsychology Reviews, 16*(1), 17-42. doi: 10.1007/s11065-006-9002-x

Ilis, C., & Egede, L. (2009). Stroke recognition among individuals with stroke risk factors. *American Journal Medical Science, 337*(19057378), 5-10.

Tsivgoulis, G., Alexandrov, A. V., Wadley, V. G., Unverzagt, F. W., Go, R. C., Moy, C. S., . . Howard, G. (2009). Association of higher diastolic blood pressure levels with cognitive impairment. *Neurology, 73*(8), 589-595. doi: 10.1212/WNL.0b013e3181b38969