Cognitive and Military Predictors of Health-related Quality of Life in Veterans with PD

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Introduction

- Health-related quality of life (HRQoL) is important to consider when treating persons with Parkinson's disease (PwPD)
- Identifying the factors which most impact HRQoL is the first step to improve HRQoL in PD
- Poorer cognitive performance has been shown to be associated with poorer HRQoL in non-demented PwPD, but the relative contributions of specific cognitive domains, including attention [1,3], executive function [2], memory [4], and language [3], are unclear
- Military Veterans with PD presumably face these same risk factors, but also encounter additional challenges less likely experienced by civilians, such as combat exposure, post traumatic stress disorder (PTSD), and adult traumatic brain injury (TBI)
- While there is robust research examining the relationship between HRQoL and cognition in non-military PwPD, the relationship between cognition and HRQoL considering military-relevant risk factors in Veterans with PD remains vastly understudied
- **The purpose of this study was to investigate the relationship between specific cognitive domains (i.e., memory, executive function, attention, and language) and HRQoL and the impact of military-specific risk factors on this relationship in non-demented Veterans with PD**

Participants & Methods

Table 1: Clinical Characteristics & Demographic Information (n = 52)

Variables	Mean (SD)
Age (years)	71.15 (±8.07)
Education (years)	16 (±2.61)
Sex (# of M/F)	49/3
Disease Duration (months)	70.61 (±68.79)
Mattis Dementia Rating Scale [0-144]	133.69 (±6.05)
Beck Depression Inventory [0-63]	8.79 (±6.67)
PTSD Checklist for DSM-5 [0-80]	11.92 (±13.65)
Combat Exposure Scale [0-41]	6.06 (±8.88)
Adult TBI (# of injuries)	0.92 (±1.28)

- Participants completed a comprehensive neuropsychological battery from which four composite scores were calculated and used: memory, attention, executive function, and language
- Parkinson's Disease Questionnaire (PDQ-39) total score was used to assess HRQoL; all 39 items are on an ordinal scale ranging from 0 to 4, with 0 being "never" and 4 being "always"; higher scores = lower QoL
- The following Veteran-oriented variables were also used:
  - PTSD Checklist for DSM-5 (PCL-5) total score was used to measure PTSD symptoms; all 20 items are on an ordinal scale ranging from 0 to 4 (0= "not at all", 4= "extremely"); higher score = more severe symptoms
  - Combat Exposure Scale (CES; 7 items on an ordinal scale ranging from 0 to 5 [0= "no", 5= "51+ times"]) was used to assess stressors common in combat/deployed military Veterans; higher score = more stressor exposure
  - Boston Assessment of TBI - Lifetime (BAT-L) was used to determine the number of adult TBI each person experienced (18 or older)

Statistical Analyses

- Spearman correlations were conducted between PDQ-39 total score and clinical characteristics/demographics, military-oriented variables, and cognitive composite scores to determine relevant covariates ($p \leq .05$) for the regressions
- Hierarchical regressions were conducted with PDQ-39 used as criterion, significant covariates entered in block 1, and cognitive domains in block 2. Covariates were removed by backward elimination if $p > .08$ to identify trends for the purposes of future research directions.

Results

Table 2: Spearman correlations between PDQ and cognitive composites.

Variable		Memory	Attention	Executive Function	Language
PDQ Total	rho *p*	**-.380** **.005**	**-.358** **.009**	**-.335** **.015**	**-.393** **.004**

Table 3: Spearman correlations between PDQ and demographics/clinical characteristics.

Variable		Age	Gender	Education	LED	Disease Duration	BDI
PDQ Total	rho *p*	.140 .322	-.159 .259	-.203 .149	.189 .184	**.332** **.016**	**.684** **<.001**

Table 4: Spearman correlations between PDQ and military-oriented measures.

Variable		PCL Total	CES	# of Adult TBI
PDQ Total	rho *p*	**.781** **<.001**	.244 .082	.031 .828

Table 5: Final Regression Model

Predictor	Standardized Beta	T	P-Value	Overall F-Statistic	R Squared
Disease Duration BDI **PCL-5 Total** **Memory**	**.248** *.255* **.429** **-.219**	**2.526** *1.911* **3.258** **-2.314**	**.015** *.062* **.002** **.025**	F (4, 47) = 18.84 (**p < .001**)	.62

- Attention, executive function, and language did not significantly predict HRQoL and were removed from the model through backwards elimination (all p-values > .08).

Discussion

- While worse ratings of HRQoL were significantly correlated with worse cognitive performance across all cognitive domains, only **memory** performance contributed to HRQoL above and beyond relevant demographics and characteristics, such as disease duration.
  - Findings were in contrast to previous literature that identified attention as the most critical cognitive domain in PD-related HRQoL within civilian samples [1,3]
- In addition to disease duration, **PTSD history**, but not combat exposure or number of TBIs, plays a critical role in HRQoL among those with military experience
  - Veterans are much more likely to experience symptoms of PTSD than civilians
  - Previous studies have shown a significant relationship among PTSD, comorbid depression, and memory [5], which may play a part in the relationship between cognition and HRQoL in Veterans with PD as well and may explain the discrepancy in findings between previous literature and this study
- **Findings suggest that improving compensatory or restorative memory strategies through cognitive rehabilitation in addition to treatments tailored towards PTSD and HRQoL (e.g., SMART-CPT) may be helpful in improving HRQoL in Veterans with PD and comorbid PTSD symptoms**
- Additional studies are needed to better assess the relationship between PTSD and memory in Veterans with PD

Citations

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