Physical Activity Reductions in Male Veterans With Traumatic Brain Injury

Karl F. Kozlowski [1], Greg Homish [1], Michelle Alt [2], Sarah Piwowarczyk [2], Kerry Donnelly [2]

[1] University at Buffalo, SPHHP; [2] VA Healthcare Network Upstate New York

SCHOOL OF PUBLIC HEALTH AND HEALTH PROFESSIONS
University at Buffalo *The State University of New York*

VA Healthcare Network Upstate New York
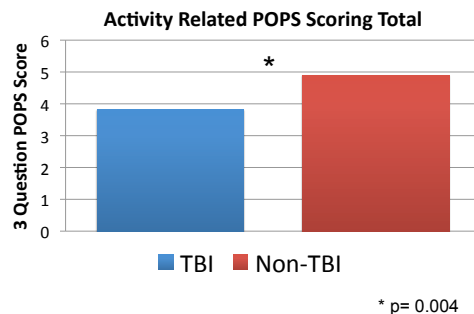U.S. DEPARTMENT OF VETERANS AFFAIRS — VETERANS INTEGRATED SERVICE NETWORK 2

INTRODUCTION

The Centers for Disease Control has estimated that more than 1.5 million head injuries occur annually in the US. The incidence of traumatic brain injury (TBI) is greater in the patient population treated by the U.S. Department of Defense and the Veterans Health Administration as a result of recent combat operations. Increases in physical activity (PA) have been shown to improve symptoms related to PTSD, depression and anxiety. Increased physical activity may also lead to a reduction in symptoms of TBI and improvements in quality of life. The purpose was to identify associations between PA and TBI in a cohort of male Veterans.

Table 1: Selected POPS Questions

"In a typical week do you do all (3), most (2), some (1) or none (0) of the…"		Mean Score	P-value
Cleaning the house	TBI	1.36 ± .81	0.538
	Non-TBI	1.44 ± .83	
Doing home repairs	TBI	1.31 ± 1.18	0.013*
	Non-TBI	1.76 ± 1.06	
Doing yard work	TBI	1.15 ± 1.09	0.002*
	Non-TBI	1.70 ± 1.13	

Figure 1:

Activity Related POPS Scoring Total

(bar chart: TBI vs Non-TBI, 3 Question POPS Score, y-axis 0–6)

*

* p= 0.004

RESULTS

Figure 2: Symptom scores in male veterans with and without a history of TBI

(grouped bar chart comparing TBI (blue) and Non-TBI (red) for NSI, BDI2, BAI, PCLM; y-axis Scores 0–60)

*p < 0.001 †p = 0.011
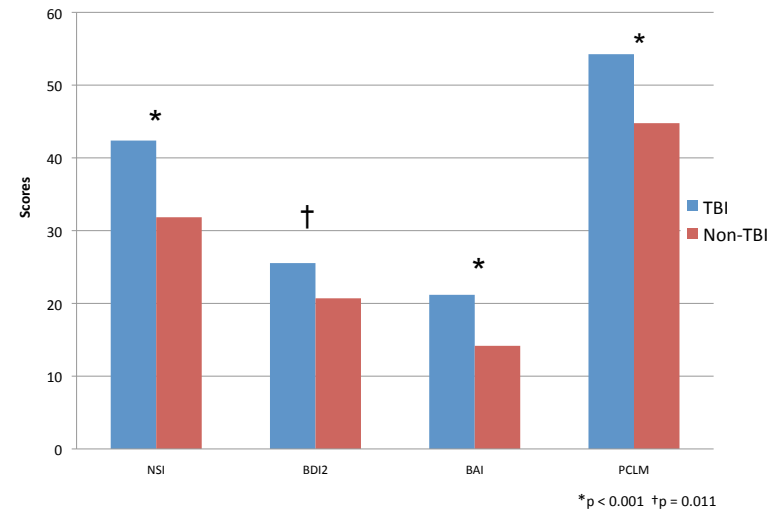
Table 2: Cleaning the House

Predictors	Beta	P-value
Race	-0.583	0.001*
Education	0.102	0.447
Age	-0.008	0.316
PCLM	0.001	0.933
BDI2	-0.005	0.623
BAI	-0.002	0.832
NSI	-0.008	0.265
TBI History	0.049	0.724

Overall Regression Significance p = 0.010

Table 3: Home Repairs

Predictors	Beta	P-value
Race	0.399	0.105
Education	-0.219	0.238
Age	0.031	0.003*
PCLM	0.015	0.170
BDI2	-0.011	0.410
BAI	-0.013	0.266
NSI	-0.004	0.665
TBI History	-0.277	0.150

Overall Regression Significance p = 0.002

Table 4: Yard Work

Predictors	Beta	P-value
Race	0.350	0.147
Education	-0.102	0.574
Age	0.035	0.001*
PCLM	0.013	0.225
BDI2	-0.015	0.286
BAI	-0.010	0.397
NSI	-0.004	0.698
TBI History	-0.337	0.075

Overall Regression Significance p ≤ 0.001

Table 5: Total POPS PA

Predictors	Beta	P-value
Race	0.165	0.746
Education	-0.239	0.534
Age	0.059	0.007*
PCLM	0.020	0.351
BAI	-0.035	0.130
NSI	-0.020	0.287
TBI History	-0.505	0.201

Overall Regression Significance p = 0.001

METHODS

Cross-sectional study examining data from one site of a longitudinal study on cognitive assessment of Veterans after TBI (n=161). PA was determined using three activity related questions (range: 0-3 each), from the Participation Objective, Participation Subjective interview (POPS). (Table 1) One-way ANOVA was used to determine group differences between Veterans with and without TBI (n=91 and 70, respectively) (Fig. 1 & 2). Multiple regression analyses were calculated to predict total PA and individual components of PA based on ethnicity (Caucasian vs. Non-Caucasian), education (HS and less vs. some college or more), age, post-traumatic stress disorder (PCLM), symptoms (NSI), depression (BDI2), anxiety (BAI) and history of TBI. (Tables 2-5)

SUMMARY

The TBI group was significantly younger than the non-TBI, (29.11 ± 7.35 to 34.63 ± 9.87 years; p≤0.001). Total PA scores (range: 0-9) were significantly lower in Veterans with TBI compared to those without (3.82 ±2.29 to 4.9 ±2.38; Fig. 1). As expected, Veterans with TBI had significantly higher scores on the BDI2, BAI, PCLM and NSI (Fig. 2). Age was a significant predictor for doing yard work, home repairs and total PA (Tables 3-5 respectively), such that one year increase in age increased scores on total PA, home repair, and yard work by 0.059, 0.031, 0.035 respectively. Ethnicity was a significant predictor for cleaning the house (Table 2) with being Caucasian related to a decrease in cleaning house scores by 0.58.

CONCLUSION

Although veterans with a history of TBI were younger, they reported reductions in PA when compared to those without a history of TBI on a surrogate marker of PA. Total PA as indicated by the POPS was significantly less in male veterans with a history of TBI. Future work should aim to quantify PA activity in veterans with TBI with a validated measure of PA. Additionally, future studies should aim to identify the relationship between the selected POPS questions and a valid and reliable measure of physical activity.