Creative Supplementation is Associated with Augmented Life Satisfaction in Service Members during TBI Rehabilitation

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Introduction

Research increasingly supports the use of creatine supplementation as an aid to recovery following traumatic brain injury (TBI) due to potential neuroprotective properties.[1,2] Evidence suggests creatine supplementation supports cerebral energy demands, improves cerebral blood flow, and may improve cognition and behavioral symptoms in conjunction with other therapeutic approaches.[3,4] The National Intrepid Center of Excellence (NICoE) Intensive Outpatient Program (IOP) is a 4-week interdisciplinary treatment program for service members with TBI history and associated health conditions.[5]

The purpose of this study was to examine if creatine supplementation may augment NICoE IOP outcomes. We evaluated the association between pre-existing creatine use and changes on self-reported post-concussive symptoms (NSI) and satisfaction with life (SWLS) between admission and discharge of the NICoE IOP.

Methods

248 NICoE IOP patients (age=40.04±5.15) were grouped by self-reported creatine use reported during the intake evaluation with a registered dietitian (non-users n=127; users n=121). Among users, creatine dosage ranged from 2.25 to 15 grams (mean=6.17±2.30 grams). Dependent variables were change scores on the NSI and SWLS generated by subtracting discharge scores from admission scores. Due to non-normal distributions, Wilcoxon rank-sum tests were used. Baseline group differences were evaluated cross-sectionally at admission.

Results

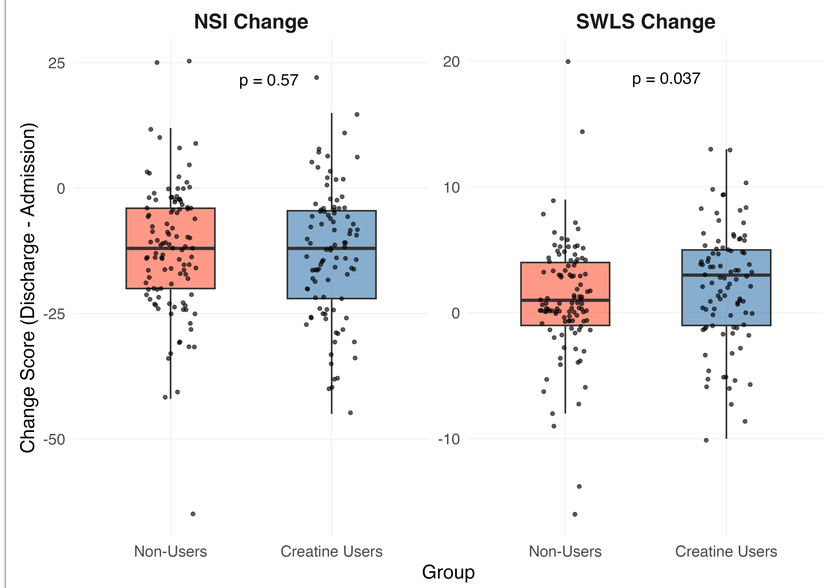
Creatine users did not significantly differ from non-users at admission on the NSI (W=7486.5, p=.44) or SWLS (W=7931.5, p=.11). Creatine use was not associated with NSI change scores (W=5414, p=.58). Creatine use was associated with significantly greater improvements in SWLS scores compared to non-users (median[IQR] change: 3[6] vs. 1[5]; W=4166, p=.037, effect size r=.15) between admission and discharge.

Table 1. Participant Characteristics and IOP Outcome Change by Creatine Use

	Creatine Non-users (n=127)	Creatine Users (n=121)	p-value / Effect
Participant Characteristics			
Age, mean ± SD	40.44 ± 4.98	39.72 ± 5.37	.277
Female, n (%)	2 (1.6%)	2 (1.7%)	1.000
Supplement Use			
Creatine dose, g/day, mean ± SD; range	—	6.27g ± 2.4g 2.25g - 15g	—
Admission Scores			
Admission NSI, median [IQR]	38.5 [20.8]	36 [21]	.440
Admission SWLS, median [IQR]	25 [8]	24 [8]	.107
IOP Change Scores			
NSI change, median [IQR]	-12 [16]	-12 [17.5]	.574; r=0.04
SWLS change, median [IQR]	1 [5]	3 [6]	**.037**; r=0.15

Change score = discharge minus admission. Positive SWLS change indicates improvement; negative NSI change indicates improvement. Effect size is Wilcoxon r.

Figure 1. NICoE Outcomes: Creatine Users vs. Non-Users (Wilcoxon Rank-Sum Tests)



Conclusions

Pre-existing creatine supplementation was associated with significantly greater improvements in life satisfaction during the NICoE 4-week IOP, despite no baseline group differences and no association with post-concussive symptom change. These findings suggest creatine may be a feasible, low-cost, supportive supplement for those undergoing interdisciplinary TBI rehabilitation. Although the observed effect was small, the median 3-point improvement in SWLS suggests a clinically meaningful change in self-reported wellbeing in the creatine user group. Prospective controlled studies are needed to evaluate creatine as an adjunct to interdisciplinary TBI care.

Disclaimer: The views expressed in this presentation are those of the authors and do not necessarily reflect the official policy of the Defense Health Agency, Department of War, or the U.S. Government.

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