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Objective: The Explosive Ordinance Disposal (EOD) community within the US Military is a specialized force in charge of the most fundamental aspects of the military operations in combat which include disarming and safely disposing explosive threats. EOD technicians have provided critical protection for our military and civilians exposed to improvised explosive devices (IEDs), which became the signature threat of both Afghan and Iraq wars. The nature of the job puts EOD technicians at high risk for blast exposures (from training and combat) resulting in traumatic brain injury (TBI) and sub-concussive head impact. Further, this population is exposed to high levels of combat with psychologically traumatic events. Given the groups neurological and psychological risk factors as well as their critical role in combat, we hypothesized that EOD technicians will present with increased psychological and neurobehavioral symptoms as well decreased cognitive functioning compared to other military personnel.
Participants and Methods: Participants were recruited from a military hospital with at least one diagnosed mild traumatic brain injury (MTBI). Exclusion criteria included TBI greater then mild severity and invalid performance on the Rey-15. Final sample included 10 EOD and 90 other military.
Cognitive measures included Hopkins Verbal Learning Test-Revised (HVLT-R); DKEFS Color Word Condition 4 Switching (CW4), Trail Making Condition 3 Letter Sequencing (TM3) and Condition 4 Switching (TM4), and Paced Auditory Serial Addition Test (PASAT). Self-report measures included the Neurobehavioral Symptom Inventory (NSI), Key Behaviors Change Inventory (KBCI), Post-Traumatic Stress Disorder Checklist (PCL-M), Patient Health Questionnaire (PHQ), Combat Exposure Scale (CES) and Blast Exposure Threshold Survey (BETS). The Ohio State University Traumatic Brain Injury Identification Method (OSU) assessed TBI history.
Results: EOD were older (EOD M=38.4, SD=4.06; Others M=33.32, SD=8.08; p=0.05), had a higher pre-morbid IQ (EOD M=110.90, SD=7.64; Other M=101.59, SD=10.55; p=0.008), more combat deployments (EOD M=5.5, SD=2.37; Others M=3.55, SD=2.98; p=0.049) and exposure to wartime atrocities (CES, p=0.003). They had greater number of MTBI (OSU EOD M=6.67, SD=3.33; Other M=3.67, SD=2.34; p=0.007), blast related MTBI (OSU-TBI EOD M=2.33, SD=1.63; Other M=0.67, SD=0.91; p<0.001), and exposure to large explosives (BETS p<0.0001). EOD reported better attention skills (KBCI Inattention, p=0.016, d=0.82; Impulsivity p=0.047, d=0.67). There was a trend for EOD to have lower neurobehavioral symptoms (NSI Total, d=0.32), post-traumatic stress (PCL d=0.39), and depression (PHQ d=0.50); however, despite the moderate effect sizes (p's >0.05). EOD presented with significantly better scores on DKEFS TMT3 (p=0.037, d=0.70), HVLT-R-Total (p=0.001, d=1.10), HVLT-R-Delayed (p=0.03, d=0.74), and attention/executive functioning skills (PASAT p=0.001, d=1.12). DKEFTS CW4 Switching (d=0.51) and TMT4 Switching were approaching significance (d=0.61) with EOD performing better.
Conclusions: As expected, the EOD sample in this study had higher number of combat deployments, greater exposure to combat atrocities (e.g., death), higher levels of exposure to large explosives, as well as a higher number of MTBI. Inconsistent with our hypotheses, despite these psychological and neurological risk factors, EOD performed better on cognitive measures of memory, attention and executive functioning. They also reported less problems with inattention and impulsivity. Results may reflect the impact of psychological and cognitive resiliency.

Categories:
Assessment/Psychometrics/Methods (Adult)
Keyword 1: traumatic brain injury
Keyword 2: cognitive functioning
Keyword 3: attention
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23 The Wandering Mind: Variability in Mindfulness is Associated with Improved Aspects of Executive Functioning.

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Objective: Research evaluating mindfulness and cognition has produced mixed results. However, variability in mindfulness has not been previously evaluated as a predictor of cognitive ability. This study evaluated the relation between intra-individual variability (IIV) in mindfulness and cognitive performance.
Participants and Methods: 274 university participants (M=19 years old, SD=1.5; 72.6% female, 67.2% White, 25.6% African American, 3.3% Asian American, 1.1% Hispanic American) completed the Five Facet Mindfulness Questionnaire (FFMQ) and the CNS Vital Signs computerized test battery. IIV was computed from the FFMQ facet T-scores. Additionally, high and low cognitive performance groups were formed from the top and bottom 16% of the sample using the neurocognition index (NCI) score from CNS Vital Signs (N=52 high NCI performance and N=46 low NCI performance).
Results: Pearson r correlations were used to evaluate the relation between mindfulness IIV and CNS Vital Signs domains. Mindfulness IIV was negatively associated with performance on the domains of psychomotor speed [r=-.18; p=.003], composite memory [r=-.14; p=.023] and verbal memory [r=-.15; p=.015]. For the high NCI group, IIV mindfulness was positively associated with cognitive flexibility [r=.31; p=.024], executive functioning [r=.33; p=.016] and was negatively related to visual memory [r=-.28; p=.043]. For the low NCI group, IIV mindfulness was negatively related to psychomotor speed [r=-.49; p<.001], composite memory [r=-.32; p=.033] and verbal memory [r=-.31; p=.038]. There was no relation found for individual FFMQ facet scores and CNS Vital Sign domains.
Conclusions: Increased consistency in self-reported mindfulness (lower IIV) was associated with greater processing speed and memory performance in the overall sample. However, the relation been mindfulness IIV and cognitive performance changed greatly in high NCI performers compared to low NCI performers. The low NCI group may be a proxy for poor effort which would explain why more variable self-reported mindfulness was associated with worse performance for processing speed and memory and this could be driving the results for the overall sample. However, our findings for the high NCI performance group are unique and suggest an association between increased variability in mindfulness facets and improved cognitive flexibility and executive functioning. Further study of mindfulness variability and aspects of executive functioning is warranted.

Categories:
Assessment/Psychometrics/Methods (Adult)
Keyword 1: cognitive functioning
Keyword 2: neuropsychological assessment
Keyword 3: metacognition
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24 Demographic Adjustment Is Not Demographic Correction: A Simulation Study

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Objective: Prior studies have presented demographic adjustment as beneficial because it helps equalize, across demographic groups, the percentage of participants (recruited from the general population without prior diagnosis) who fell beneath the test impairment cutoff (e.g., Smith, et al., 2008). This methodology ignores the possibility that group differences in those falling beneath an impairment cutoff could reflect cognitive impairment prevalence differences between demographic groups in the undiagnosed general population. Demographic group differences in cognitive test scores reflect a mixture of two categories of influences: measurement bias (item/test/examiner bias, language/cultural bias, stereotype threat, etc.) and factors which differentially increase the number of low scores in one group by increasing relative risk (RR) for cognitive impairment (biological aging processes, cognitive reserve, social determinants of health [SDoH], etc.). The current simulation study examined how the effect of demographic adjustment on the diagnostic accuracy of a hypothetical test (operationalized as the area under the curve [AUC] in an ROC analysis) varied as the mixture of influences which caused demographic differences in scores were varied.
Participants and Methods: 215,040 samples were randomly generated. Each sample consisted of two demographic groups, with

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