

ABSTRACT:

Background: While military action is inherently dangerous, mitigating physical injury and psychological injury (e.g., PTSD, depression, anxiety) in soldiers is a central responsibility of the US Armed Forces. The US Army's Battlemind Program is a signpost of a growing awareness within the US Armed Forces that psychological health in soldiers prior to, during, and following their in-theater participation is important for an effective military. The program's initiation was a critical step in providing "mental armor" to complement the body armor necessary for soldiers' physical safety and well-being. Recently, we have developed an alternative psychological health program to similarly buffer against psychological injury known as mindfulness-based military training (MBMT). Mindfulness-based training techniques, upon which MBMT is modeled, have beneficial effects on psychological and physical health, attention, and working memory in civilian cohorts (see Jha et al., 2007 for review). In addition, our preliminary studies suggest that similar benefits are present with MBMT in a pre-deployment military cohort. While MBMT shows promise as a psychological health and resiliency program, it is a very time-intensive program. As such, our primary aim is to determine the relative efficacy of three programs which vary along the critical dimension of course duration. We refer to these three programs as M24, M16, and M13 to signify that they are MBMT variants with different course durations, 24, 16, and 13 hours of course instruction time, respectively.

Objective/Hypothesis: Our overarching objective is to optimize the MBMT course format for best delivery of mindfulness-based skills training to promote psychological health and resilience in soldiers. We will investigate this objective by comparing M24, M16, and M13 to a no-treatment control group along 5 dimensions of interest (see below). The critical group-wise difference in course duration is a proxy for two dimensions: 1) Didactic content regarding psychological health, stress-reactivity, self-regulation and cognitive optimization, and neuroplasticity; and 2) Mindfulness skills-related content including formal instructor-guided overview of mindfulness-exercises, feedback on skills development, as well as instructor and group discussion on skills' 'roadblocks' and optimization. We hypothesize that: 1) The degree of relative advantage in mind-body functioning with mindfulness training will be proportional to the amount of out-of-class practice in which soldiers engage, with greater benefits when mindfulness practices are more frequent, consistent, and engaged in for increasingly longer timeperiods. We predict that all MBMT groups will show improved neural, cognitive, affective, and somatic benefits in functioning compared to a no-intervention control group (M0). 2) The amount of didactic content and mindfulness skills-training that are delivered in the courses (comparisons across M24, M16, M13) may influence how often participants engage in mindfulness exercises out of class as well as the self-reported quality/integrity of their formal practice time. 3) The key mechanism of action by which mindfulness-training produces beneficial effects is by strengthening executive attention capacity, which is the capacity to monitor and control thoughts, feelings, and actions in the service of behavioral goals.

Specific Aims: We aim to compare and contrast M24, M16, M13, and M0 along our 5 measures of interest: 1) Neural effects of training on brain-indices of executive attention using EEG/ERP markers of neural functioning. 2) Behavioral/performance consequences of each intervention on cognitive neuroscience tasks of attention, working memory, and emotion-regulation. 3) Somatic effects on diurnal salivary cortisol which is an established proximal biomarker for psychological stress. 4) Clinical evaluation and subjective indices of psychological health and well-being using self-report instruments. 5) Quantity and quality of out-of-class practice time and the type of practices in which participants choose to engage.

Study Design: In this 3-year study, we will recruit four US Army infantry platoons not in the deployment cycle comprising 40 soldiers each platoon (160 soldiers total). The four platoons tested here will be matched across age, gender and rank. All subjects will be tested at three timepoints (T1: prior to beginning of training course, T2: 9 weeks after each program begins, T3: four months after T2) on all of our measures of interest.

Relevance: This behavioral and preventative translational research project aims to determine best practices for noninvasive, long-term intervention methods to promote psychological resilience in military personnel. If mindfulness-based methods are found to be efficacious, their potential to be delivered by nonclinical trained personnel at low risk would facilitate their broad and immediate implementation.