



Research paper

Mindfulness meditation in the Israel Defense Forces: Effect on cognition and satisfaction with life—A randomized controlled trial

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ABSTRACT

Introduction: Mindfulness meditation (MM) may improve information processing speed (IPS) and quality of life. During intense military training tenacious performance demands may lead to cognitive and emotional distress. We aimed to assess if MM fortifies concentration and affects satisfaction with life. **Methods:** Soldiers recruited during their professional training at the beginning of their compulsory military service in the Israel Defense Force. Participants (n = 150) were block randomized to either MM or to a military control group (MC).

MM and MC groups were matched for age, education and gender. The MM group attended an 8-week MM course followed by additional 16 weeks of supervised practicing. The primary outcome measure was IPS evaluated by the digit-symbol-substitution-test (DSST) and the secondary measure was satisfaction with life (SWLS).

Results: At the end of the study, data was available for analysis on 65 soldiers in the MM group 65 and 58 in the MC group. Mean baseline DSST scores were 57 ± 6 for the MM and 54.5 ± 7 for the MC group ($p = 0.7$). DSST scores remained stable over time in controls while significantly improving in the MM group, ($\Delta = +15$; $p < 0.01$).

In both groups baseline SWLS scores were high and no significant changes were measured at the end of the study.

Conclusions: MM practice improves IPS in motivated soldiers. No effect on satisfaction with life was observed in the present study.

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1. Introduction

People's minds wander frequently and surprisingly the nature of people's undertakings has only a modest impact on whether their minds wander. This "mind wandering" appears to be the brain's default mode. This prominent ability may have an emotional cost. People are less happy when their minds are wandering [1]. In 1996 Baumeister and Heatherton wrote, "Over and over, we found that managing attention was the most common and often the most effective form of self-regulation..." [2,3].

Mindfulness is a psychic mode characterized by full attention to present-moment experience without conceptual elaboration or emotional reactivity. The management of attention is one of the core aspects of mindfulness meditation (MM). Exercises that involve attention are central to most MM practices. A growing

number of studies have reported results consistent with the assumption that MM improves attentional control [4,5]. However, for many who are employed at high-stress jobs or who serve in security forces, rescue services or the army, little is known about the effectiveness of MM at shielding against psychological sequel of prolonged stress [6].

In 2010, Jha et al. investigated the impact of MM on working memory capacity and affective experience in two military cohorts during the high-stress predeployment interval. The MM group attended an 8-week MM course and working memory capacity increased in those with high practice time. Higher MM practice time also corresponded to lower levels of negative affect and higher levels of positive affect [7].

Regarding the terminology used in this study, it should be noted that 'resilience'—generally used to describe the ability to recover from difficulties—is a term used in varying ways by different authors, not all of whom describe how they define the term. What does seem to be agreed upon is that psychological resilience relates to the adaption of individuals after trauma, and that certain

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“protective” factors may influence the extent to which individuals adapt. Similarly, “wellbeing” may be variably defined in the literature.

Mind and body practices for military personnel has focused on two distinct goals; on the one hand enhancing fitness and resilience and on the other managing and treating anxiety. In order to identify potential training to enhance comprehensive soldier fitness, Rees and colleagues screened over 11,500 articles for relevance regarding soldier resilience. The resulting order of intervention’s merit was Transcendental Meditation, Mindfulness, and progressive muscle relaxation. The authors conclude that these are suitable potential options for improving soldier resilience [8]. Support for these findings was exemplified by a study of soldiers naive to yoga that were assigned to yoga and breathing awareness groups randomly compared to a meditative music group. Performance in a DSST task and a state anxiety subscale was assessed immediately before and after two 45-min sessions. DSST scores increased in yoga practitioners and meditation practitioners. This suggests that even in army personnel naive to yoga, a yoga-based intervention or concentrative meditation could increase performance on an attention task [9]. A large survey of the literature on multimodal training programs for the self-management of emotional stress was undertaken in 2013. Select programs such as mindfulness-Based Stress Reduction and other meditation and mind-body skills practices are highlighted as feasible and implementation within military settings needs more attention [10]. Furthermore a focused look at meditation, imagery, acupuncture, and yoga as the most frequently offered mind and body practices in the USA department of Veterans Affairs was published a year later. Elwy and colleagues [11] conducted a systematic review of mind and body practices used with veterans or active duty military personnel. They searched 5 databases using 27 different National Centre for Complementary and Alternative Medicine-defined mind and body practices as text words, keywords, and MeSH terms. Of 1819 studies identified; 89 interventions (50 Randomized Controlled Trials) published between 1976 and 2014; conducted in 9 countries; using 152 different measures to assess 65 health and well-being outcomes were analyzed. Elwy and colleagues [11] found that meditation practices were the most frequently studied. The authors concluded that creating a repository of mind and body intervention outcome measures may further future research efforts; as would conducting pragmatic trials [11]. Two such pragmatic trials indeed supported the authors’ conclusions. The regular practice of Transcendental Meditation or breathing-based meditation decreased the need for psychotropic medications required for anxiety and post-traumatic stress disorder management and increased psychological wellbeing. These findings from a study focusing on military service members with documented PTSD or anxiety disorder provide insight into the benefits of meditation as a viable treatment modality in military treatment facilities [12,13].

In the present study MM was tested as a potential tool for strengthening capacities that are at risk of being corrupted over an interval of persistent burdens. Specifically, we aimed to determine whether MM might be beneficial to Israel Defense Forces (IDF) members in the demanding initial stages of training for their military vocation. We aimed to assess if MM reinforces basic cognitive traits and affects satisfaction with life.

2. Methods

2.1. Participants

All participants (N=150) were IDF recruits who had recently completed basic training and were assigned to begin professional training designed to provide them with the knowledge and skill to

serve. This was a convenience sample. Participants were randomly assigned in “blocks”–according to their classes’ schedule–to the mindfulness meditation (MM) or military controls (MC) groups. None of the participants in the two groups had any earlier experience with any form of meditation. It is important to note that none of the participants were using any mental health services and none were prescribed any physical or psychotropic medications during the study period.

The IDF approved this project. All participants had agreed to participate in this project after a detailed explanation of the aims and methods.

2.2. Intervention

The MM group attended an 8-week meditation course followed by additional 16 weeks of supervised practicing formal MM. The MM course was planned and delivered by one of the authors (SR) a certified MM teacher with 15 years’ experience of mindfulness practice and training. The course involved 20 h of class instruction over 8 weeks, with daily meetings. The additional following 16 weeks comprised supervised MM twice weekly by the same author and teacher. Each class session consisted of didactic instruction, a group discussion of the didactic topics and interactive mindfulness-based exercises. At first, exercises emphasized attention on a single focus, such as the breath (breath awareness practice), “contact points” between body parts and the floor or chair, or sensations within specific body parts (body scan exercise) similar to the technique described by Jha et al. [7].

MM included didactic content to highlight parallels between physical and mental fitness. The course also added specific guidance for using focused attention to regulate physiological and psychological symptoms when experiencing stress. Thus, MM blended mindfulness skills training with information about stress in the body.

Each class session consisted of didactic instruction, a group discussion of the didactic topics and interactive mindfulness-based exercises. In later stages of training exercises were added that required attention to body sensations during movement and “shuttling” the attention between inner sensations and outer experiences (i.e., sights or sounds). MM was taught on-site at the unit’s various training locations.

The MC group were presented with the daily news during the same time and for the same duration as their counterparts were practicing MM.

2.3. Outcome measures

All participants took part in two testing sessions, occurring before MM and 1 week after the 24-weeks MM course. The primary outcome measure was defined as the change in score of the 90 s DSST. The secondary outcome was change in satisfaction with life of participants. All questions were answered anonymously. This was the first time the participants encountered these scales.

2.3.1. DSST

A key mechanism in cognitive abilities is speed in processing upcoming information. The Digit Symbol Substitution Test (DSST) from the WAIS-III was used to assess cognitive speed. Participants were presented with rows of empty boxes labeled with a digit. They were required to fill in these boxes as quickly as they could with a corresponding symbol, according to a digit/symbol code that was permanently displayed. The total number of boxes accurately filled in within 90 s was tallied.

The DSST requires the rapid processing of symbolic information and the transcription of numbers that are paired with the symbols on a tracking task. This test has been assumed to measure the

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