Mindfulness-based Mental Training in a High Performance Combat Aviation Population: A One-Year Intervention Study and Two-year Follow-up

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Introduction
At the core of safe flying lies the capability of regulating and focusing attention (Stanton, Chambers, & Piggott, 2001). Failing to identify important changes or pay attention to what is relevant in a given situation can have serious consequences in aviation. One potential method of regulating attention is mindfulness training (MT). Research investigating how MT is applicable to specially selected healthy populations preparing for peak performance is limited. The aims of the study were to investigate: (1) implementation and feasibility of a 1-year MT intervention in a military population of high performance aviators, and (2) changes in mental skills and measures related to worker satisfaction as a result of MT.

Methods
We recruited all available personnel at a Norwegian military combat aircraft squadron (n=21, mean age=33, range 22-50 years). Subjective measures of mindfulness, mental skills, anxiety, burn-out, and worker satisfaction were administered before and after a 1-year intervention, including a semi-structured interview at after the intervention. Qualitative feedback and measures of mindfulness were collected via email at 12 and 24 months during the follow-up period.

The intervention
The MT intervention consisted of 14 plenary lectures and 20 minutes daily personal practice. In MT, one is encouraged not to manipulate, change, or engage in any thoughts, feelings or bodily sensations. Instead MT involves a non-judgmental observation of inner and outer experience as it appears in consciousness, endeavoring to let them go, and gently returning to the intended focus, e.g. the breath or an ongoing activity.

Results
On a scale from 1-10, where a high score indicated satisfaction, the average score for the overall intervention was 8.4 (SD = 1.0). Eighty percent of the participants underscored the importance of a long-term (12-month) intervention period. There was a general post-intervention increase in scores on all the factors of mindfulness (fig. 1), with the higher levels remaining throughout the 2 years of the follow-up period. Significant improvements in arousal and attention regulation were also found (fig. 2). The interview data at post test confirmed the beneficial effects of the training. Participants also reported MT to improve the quality of professional and private relationships, as well as having direct operational value. Lengthy plenary sessions, a lack of individualized practice, and motivation to do personal practice were highlighted as the most important limitations of the intervention.

Discussion
These findings can be interpreted to support that this MT intervention was efficient in improving mindfulness, arousal regulation and attention skills in individuals who are already quite accomplished. Given the reported operational value of MT together with the potential consequences of being unfocused or inattentive, in high performance aviation, these findings imply a probable and important operational relevance. If delivered with enough attention to work scheduling and motivation, a 12-month MT program may be a feasible and acceptable intervention for a high performance population.

One should be careful to generalize the findings due to a number of limitations, including the lack of a control group, use of a small study sample, and exclusive use of self-report measures in one squadron exclusively.

Figure 1. Mean change scores on mindfulness from pre to post (n = 17).

Figure 2. Mean scores on mental skills at pretest (T1) and posttest (T2) (n=12).