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### A Combination of Magnesium, B Vitamins, Green Tea and Rhodiola Attenuates the Negative Effects of Acute Psychosocial Stress on Subjective State in Adults

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**Objectives:** Magnesium (Mg), and green tea and rhodiola extract supplementation have, in isolation, been shown to improve subjective stress perception and mood responses to acute stress. The combined capacity of these ingredients to confer protective effects during exposure to stress has yet to be evaluated. We tested the hypothesis that a combination of Mg (with B vitamins) + green tea + rhodiola would improve physiological and subjective responses to stress exposure in adults compared to placebo and Mg + B vitamins + green tea or rhodiola in isolation.

**Methods:** A double blind, randomised, placebo controlled, parallel group design was employed. 100 moderately stressed (DASS 13–25) adults (*mean age* = 25.07, *SD* = 0.65) received oral supplementation of either (i) Mg + B vitamins + green tea + rhodiola; (ii) Mg + B

vitamins + rhodiola; (iii) Mg + B vitamins + green tea; or (iv) placebo. After supplementation participants were exposed to the Trier Social Stress Test. Subjective stress (Stress and Arousal Checklist; SACL), mood (Profile of Mood States; POMS) and salivary cortisol responses were collected over 8 hours to ascertain the effects of supplementation on stress responsivity and recovery.

**Results:** Analyses demonstrated the superiority of the combined treatment vs the ingredients in isolation and placebo. The combined treatment significantly attenuated subjective stress (SACL), and tension and total mood disturbance (POMS) ratings after acute stress exposure (all  $P < .05$ ). Effects were found both during the peak stress response and recovery. The salivary cortisol response was unaffected by treatment.

**Conclusions:** A combination of Mg + B vitamins + green tea + rhodiola significantly alleviated subjective stress and mood responses to acute stress provocation. This preliminary evidence suggests the capacity of these ingredients in combination to confer protective effects under conditions of stress in adults.

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