

## Innovative Food Related Modification of the Day-Night Task Demonstrates Impaired Inhibitory Control among Patients with Binge-Purge Eating Disorder

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**Abstract :** Introduction: Eating disorders (ED) are common psychopathologies which involve distorted body image and eating disturbances. Binge-purge eating disorders (B/P ED) are characterized by repetitive events of binge eating followed by purges. Patients with B/P ED behavior may be seen as impulsive especially when relate to food stimulation and affective conditions. The current study included innovative modification of the day-night task targeted to assess inhibitory control among patients with B/P ED. Methods: This prospective study included 50 patients with B/P ED during acute phase of illness (T1) upon their admission to specialized ED department in tertiary center. 34 patients repeated the study towards discharge to ambulatory care (T2). Treatment effect was evaluated by BMI and emotional questionnaires regarding depression and anxiety by the Beck Depression Inventory and State Trait Anxiety Inventory questionnaires. Control group included 36 healthy controls with matched demographic parameters who performed both T1 and T2 assessments. The current modification is based on the emotional day-night task (EDNT) which involves five emotional stimulation added to the sun and moon pictures presented to participants. In the current study, we designed the food-emotional modification day night task (F-EDNT) food stimulations of egg and banana which resemble the sun and moon, respectively, in five emotional states (angry, sad, happy, scrambled and neutral). During this computerized task, participants were instructed to push on "day" bottom in response to moon and banana stimulations and on "night" bottom when sun and egg were presented. Accuracy (A) and reaction time (RT) were evaluated and compared between EDNT and F-EDNT as a reflection of participants' inhibitory control. Results: Patients with B/P ED had significantly improved BMI, depression and anxiety scores on T2 compared to T1 (all  $p < 0.001$ ). Task performance was similar among patients and controls in the EDNT without significant A or RT differences in both T1 and T2. On F-EDNT during T1, B/P ED patients had significantly reduced accuracy in 4/5 emotional stimulation compared to controls: angry ( $73 \pm 25\%$  vs.  $84 \pm 15\%$ , respectively), sad ( $69 \pm 25\%$  vs.  $80 \pm 18\%$ , respectively), happy ( $73 \pm 24\%$  vs.  $82 \pm 18\%$ , respectively) and scrambled ( $74 \pm 24\%$  vs.  $84 \pm 13\%$ , respectively, all  $p < 0.05$ ). Additionally, patients' RT to food stimuli was significantly faster compared to neutral ones, in both cry and neutral emotional stimulations ( $356 \pm 146$  vs.  $400 \pm 141$  and  $378 \pm 124$  vs.  $412 \pm 116$  msec, respectively,  $p < 0.05$ ). These significant differences between groups as a function of stimulus type were diminished on T2. Conclusion: Having to process food related content, in particular in emotional context seems to be impaired in patients with B/P ED during the acute phase of their illness and elicits greater impulsivity. Innovative modification using such procedures seem to be sensitive to patients' illness phase and thus may be implemented during screening and follow up through the clinical management of these patients.

**Keywords :** binge purge eating disorders, day night task modification, eating disorders, food related stimulations

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