Induced stress during dual task improved secondary task performance at the sacrifice of primary task performance

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INTRODUCTION

• Completing a simultaneous secondary task while standing or walking, i.e. a high cognitive load situations, may disrupt one’s postural control [1,2].

• Several factors such as pathology, aging, and stress may have an effect on the performance of each task being completed [3].

PURPOSE:

• We aimed to investigate the effect of induced stress on the performance of each task during a high cognitive load situations. The high cognitive load situations S included standing while completing a secondary motor task (wire maze).

METHODS

• Participants (Tab. 1) were asked to randomly stand 1) quietly, or while completing the wire maze 2) with or 3) without a loud buzzer noise (Fig. 1). Stress was induced through a loud buzzer when the ring contacted the maze.

RESULTS

• Perceived stress was measured after each trial. Scores ranged from 1 to 10 with 10 representing the highest level of stress.

• Both task performances were assessed :
  • Primary task performance: Ground reaction force sample entropy in the anterior posterior (AP) and mediolateral (ML) directions during quiet standing, and standing while doing wire maze [4].
  • Secondary task performance: The number of times the subject touched the metal ring to the wire maze was recorded as the number of errors.

MEASUREMENTS:

• Perceived stress was measured after each trial. Scores ranged from 1 to 10 with 10 representing the highest level of stress.

• Both task performances were assessed :
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• One-way repeated measures ANOVAs were used to compare dependent variables during the three conditions (α=0.05).

DISCUSSION and CONCLUSIONS

• During the most stressful high cognitive load situations, the high level of perceived stress coincided with less wire maze errors.

• The addition of a secondary task increased the regularity of the ground reaction force in both directions, which might be due to more automatic and less flexible postural control.

• Induced stress during high cognitive load situations caused a cost for postural control, yet a benefit for wire maze performance, indicating task prioritization under stress.

• Identifying the strategies underlying task prioritization can help clinicians design appropriate interventions to challenge patients appropriately to improve performance during high cognitive load situations

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