Biopsychosoc Med. 2011 Jun 30;5:8. doi: 10.1186/1751-0759-5-8.

Helplessness and perceived pain intensity: relations to cortisol concentrations after electrocutaneous stimulation in healthy young men.

Müller MJ.

BACKGROUND:

Uncontrollable aversive events are associated with feelings of helplessness and cortisol elevation and are suitable as a model of depression. The high comorbidity of depression and pain symptoms and the importance of controllability in both conditions are clinically well-known but empirical studies are scarce. The study investigated the relationship of pain experience, helplessness, and cortisol secretion after controllable vs. uncontrollable electric skin stimulation in healthy male individuals.

METHODS:

Sixty-four male volunteers were randomly assigned to receive 30 controllable (self-administered) or uncontrollable (experimenter-administered) painful electric skin stimuli. Perceived pain intensity (PPI), subjective helplessness ratings, and salivary cortisol concentrations were assessed. PPI was assessed after stress exposure. For salivary cortisol concentrations and subjective helplessness ratings, areas under the response curve (AUC) were calculated.

RESULTS:

After uncontrollable vs. controllable stress exposure significantly higher PPI ratings ($P = 0.023$), higher subjective helplessness AUC ($P < 0.0005$) and higher salivary cortisol AUC ($P = 0.004$, t-tests) were found. Correlation analyses revealed a significant correlation between subjective helplessness AUC and PPI ($r = 0.500$, $P < 0.0005$), subjective helplessness AUC and salivary cortisol AUC ($r = 0.304$, $P = 0.015$) and between PPI and salivary cortisol AUC ($r = 0.298$, $P = 0.017$).

CONCLUSIONS:

The results confirm the impact of uncontrollability on stress responses in humans; the relationship of PPI with subjective helplessness and salivary cortisol suggests a cognitive-affective sensitization of pain perception, particularly under uncontrollable conditions.

PMID: 21718526 PMCID: PMC3141369