World Academy of Science, Engineering and Technology
International Journal of Psychological and Behavioral Sciences
Vol:15, No:11, 2021

Developing a Methodology to Examine Psychophysiological Responses during Stress Exposure and Relaxation: An Experimental Paradigm

Authors : M. Velana, G. Rinkenauer

Abstract : Nowadays, nurses are facing unprecedented amounts of pressure due to the ongoing global health demands. Work-related stress can cause a high physical and psychological workload, which can lead, in turn, to burnout. On the physiological level, stress triggers an initial activation of the sympathetic nervous and adrenomedullary systems resulting in increases in cardiac activity. Furthermore, activation of the hypothalamus-pituitary-adrenal axis provokes endocrine and immune changes leading to the release of cortisol and cytokines in an effort to re-establish body balance. Based on the current state of the literature, it has been identified that resilience and mindfulness exercises among nurses can effectively decrease stress and improve mood. However, it is still unknown what relaxation techniques would be suitable for and to what extent would be effective to decrease psychophysiological arousal deriving from either a physiological or a psychological stressor. Moreover, although cardiac activity and cortisol are promising candidates to examine the effectiveness of relaxation to reduce stress, it still remains to shed light on the role of cytokines in this process so as to thoroughly understand the body's response to stress and to relaxation. Therefore, the main aim of the present study is to develop a comprehensive experimental paradigm and assess different relaxation techniques, namely progressive muscle relaxation and a mindfulness exercise originating from cognitive therapy by means of biofeedback, under highly controlled laboratory conditions. An experimental between-subject design will be employed, where 120 participants will be randomized either to a physiological or a psychological stress-related experiment. Particularly, the cold pressor test refers to a procedure in which the participants have to immerse their non-dominant hands into ice water (2-3 °C) for 3 min. The participants are requested to keep their hands in the water throughout the whole duration. However, they can immediately terminate the test in case it would be barely tolerable. A pre-test anticipation phase and a post-stress period of 3 min, respectively, are planned. The Trier Social Stress Test will be employed to induce psychological stress. During this laboratory stressor, the participants are instructed to give a 5-min speech in front of a committee of communication specialists. Before the main task, there is a 10-min anticipation period. Subsequently, participants are requested to perform an unexpected arithmetic task. After stress exposure, the participants will perform one of the relaxation exercises (treatment condition) or watch a neutral video (control condition). Electrocardiography, salivary samples, and self-report will be collected at different time points. The preliminary results deriving from the pilot study showed that the aforementioned paradigm could effectively induce stress reactions and that relaxation might decrease the impact of stress exposure. It is of utmost importance to assess how the human body responds under different stressors and relaxation exercises so that an evidence-based intervention could be transferred in a clinical setting to improve nurses' general health. Based on suggestive future laboratory findings, the research group plans to conduct a pilot-level randomized study to decrease stress and promote well-being among nurses who work in the stress-riddled environment of a hospital located in Northern Germany.

Keywords : nurses, psychophysiology, relaxation, stress
Conference Title : ICHPS 2021 : International Conference on Health Psychology and Stress
Conference Location : Istanbul, Türkiye
Conference Dates : November 08-09, 2021