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Effectiveness of progressive muscle relaxation and biofeedback relaxation in lowering physiological arousal among students with regard to personality features

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Abstract

Background. Students make a rather specific population, which has to overcome many obstacles in order to pursue their academic goals (Pierceall, Keim 2007). Special programmes for stress prevention, based on relaxation training are being established in universities. The effectiveness of these programmes is constantly assessed and ways of their improvement are being studied (Jones, Johnston 2000, Beddoe, Murphy, 2004). One of the directions for such studies is the studying the effectiveness of relaxation training in relation to personality characteristics. However, there is lack of studies analysing the impact of personality features on individual's ability to relax and ability to learn to relax. Both biofeedback-assisted and progressive muscle relaxation are regarded as interventions aimed at lowering stress response. These methods help to train relaxation skills as well. *The aim* of the study was to assess the effectiveness of biofeedback-assisted relaxation as well as progressive muscle relaxation in lowering psychophysiological parameters with regard to personality features. *Method.* The subjects of the study were 122 university students. 105 (85 female and 20 male) of them, aged 18 to 36 (mean age 21.13 (SD 2.58), participated in all relaxation training sessions. Participants were randomly assigned into three different groups: a) four progressive muscle relaxation sessions (n = 34) or b) four biofeedback-assisted relaxation sessions (n = 35). Subjects in the c) control group participated only in the 1st and the 6th session without relaxation training (n = 36). Biofeedback-assisted relaxation was conducted using device NeXus – 10 (The Netherlands). *Results and conclusions.* Both relaxation methods proved to be effective in lowering psychophysiological variables. Methods of lowering psychophysiological variables should be applied with regard to personality traits of individuals: the course (of four sessions) of both types of relaxation helps to lower skin conductance in persons with higher scores of openness, agreeableness and conscientiousness and helps to lower heart rate in persons with higher scores of neuroticism and extraversion.

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1. Introduction

Experiencing average levels of stress is rather common among students (Busari, 2014). Nevertheless, too much stress might be related to an increased anxiety level and depression symptoms (Dyson, 2006), worse sleep quality, fatigue (Kelly, 2001), muscle tension (Davey, Cheung, 2010), unhealthy eating habits, low physical activity, lower self-esteem, suicidal tendencies (Hudd et al., 2000; Busari, 2014) and decreased academic performance (Womble, 2003; Busari, 2014). Strong and long-lasting stress may reduce academic achievements, have a negative influence on students' life and increase substance abuse (Richlin-Klonsky, Hoe, 2003).

Universities employ a large variety of skills training programmes for academic stress reduction. These programmes include various stress management tachniques, such as cognitive restructuring, problem solving or time management skills training (Jones, Johnston 2000; Beddoe, Murphy, 2004), improvement of relaxation skills using progressive muscle relaxation (PMR) or biofeedback-assisted relaxation (BAR) (Rasid, Parish, 1998; Ratanasiripong, Sverduk, Prince, Hayashino, 2012), etc.

PMR as well as BAR are used to improve relaxation skills enabling a student to lower stress response. Researchers analyse the effectiveness of these methods (Kerr, 2000; Yucha, Gilbert, 2004) including students' population as well (Ratanasiripong, Sverduk, Prince, Hayashino, 2012; Khanna et al., 2007; Rasid, Parish, 1998; Matsumoto, Smith, 2001). Many studies have confirmed the effectiveness of these relaxation techniques (Khanna et al., 2007; Ratanasiripong et al., 2012; Matsumoto, Smith, 2001).

It is assumed that personality features might be related to the occurrence of chronic or frequent stress, which has a negative impact on a person's health. Therefore, recent studies include analyses of personality characteristics in relation to stress (Sharma, 2011; Vearing, Mak, 2007; Connelly, Denney, 2007; Gorynska, Winiewski, Zajenkovski, 2015). Personality plays a significant role not only in stress evaluation (reaction to different stimuli) and in coping mechanisms of an individual, it has an impact upon selection and modelling of stress-inducing situations as well (Vollrath, 2001; Karimzade, Besharat, 2011).

Acording to Sharma (2011) relaxation plays a significant role in facing stress. 100 college students participated in the study with the the aim to analyse the influence of personality patterns on individual's ability to relax. The study demonstrated that extraverts relaxed more easily than introverts and relaxation was related to facilitating coping reactions. This suggests that in designing stress management techniques personality must be taken into consideration to make these techniques effective. Another study (Zin et al., 2008) reported that extraverts, rather than introverts, seemed to benefit more from both music and progressive muscular relaxation.

Thompson, Steffert, Gruzelier (2009) point out the importance to consider personality when planning stress intervention measures. The aim of their study was to determine whether the effectiveness of guided imagery training on immune-based measures was dependent upon openness to experience. The results indicated that training effectiveness was moderated by openness. When openness was high, cortisol increased and tiredness decreased as compared to the cntrol group. No differences across groups were observed when openness was low. The authors agreed that openness to experience should be considered as a potentially important moderator in future studies examining intervention efficacy in healthy populations. Nevertheless, in their study the autors did not analyse other Big Five personality traits like neuroticism, extraversion, agreeableness and conscientiousness. Thompson, Steffert, Gruzelier, (2009) found that in some studies not all individuals have demonstrated benefits from guided imagery, and they agreed that one possible explanation for this finding was that intervention efficacy is dependent upon personality.

The influence of personality dimensions on relaxation response is still poorly understood (Schneider, 2011). Earlier research studies examining the role of personality in coping strategy use have been focused on the role of single traits. It is assumed that complex examination of personality features may add to our understanding of the stress and coping process (Vearing, Mak, 2007; Sharma, 2011; Karimzade, Besharat, 2011; Lee-Baggley, Preece, & DeLongis, 2005).

Finally, very limited research has analysed interactions between the Big Five dimensions of personality and relaxation training efficacy (Thompson, Steffert, Gruzelier, 2009; Ziv, Rotem, Arnon, Haimov, 2008).