

**5<sup>th</sup> icCSBs 2017**  
**The Annual International Conference on Cognitive-Social,  
and Behavioural Sciences**

**ASSOCIATIONS OF POSITIVE PERSONALITY  
CHARACTERISTICS WITH PSYCHOPHYSIOLOGICAL  
RESPONSE TO STRESSORS: LITERATURE REVIEW.**

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*Abstract*

Positive personality characteristics (e.g. hardiness) are important predictors of lower stress. However, it is not clear how positive personality characteristics affect physiological response to stressors. The purpose of this study is to review the existing evidence about how different positive personality characteristics, such as optimism, affect physiological response to psychosocial and physiological stressors in humans. Systemic analysis of empirical articles published 1996-2016 in PubMed, Scencedirect, Medline, Health sources databases was performed. A search was conducted in abstracts of articles by keywords: stressor\* AND physiolog\* AND respon\* AND trait\*. Results revealed that positive personal characteristics, such as hardiness, self-esteem, social affiliation, ego resiliency, altruism, straightforwardness, optimism and spirituality predicted better response to psychosocial stressors. Altruism and straightforwardness predicted better response to physiological stressors. Optimism, psychological, emotional and social well-being does not predict better response to physiological stressors whereas hardiness, self-esteem, social affiliation, ego resiliency, altruism, straightforwardness, optimism and spirituality predict better response to psychosocial stressors. Altruism and straightforwardness predict a better response to physiological stressors unlike social, emotional, psychological well-being and optimism. Further research is needed to confirm importance of the specified positive personal characteristics for physiological and psychological response to different types of stressors..

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**Keywords:** Personality, traits, response, physiological, psychosocial, stressors.,



## 1. Introduction

According to the World Health Organization, “The proportion of deaths due to non-communicable disease is projected to rise from 59% in 2002 to 69% in 2030” (Mathers & Loncar, 2006, p. 1) and cardiovascular diseases (CVD) will be the biggest contributor of that rise (Mathers & Loncar, 2006). Traditional factors (e.g. smoking, low physical activity) cannot fully explain why burden of CVD is rising, so there is a need to look for alternative factors which may help to stay healthy (Sapranaviciute-Zabazlajeva, 2015). It is believed that only comprehensive (biopsychosocial) approach to non-communicable diseases can help reduce morbidity (Von Kanel, 2008), so there is a need to consider not only risk factors, but also factors which help to stay healthy, i.e. salutogenic factors (Antonovsky, 1996). One of possible factors which can help to stay healthy is positive personality characteristics (Peterson, Park, Seligman, 2006).

## 2. Problem Statement

Positive personality characteristics according to C. Peterson and M. Seligman (2004) are: creativity (originality, ingenuity), curiosity (interest, novelty-seeking, openness to experience), open-mindedness (judgment, critical thinking), love of learning, perspective (wisdom), bravery (valour), persistence (perseverance, industriousness), integrity (authenticity, honesty), vitality (zest, enthusiasm, vigour, energy), love, kindness (generosity, nurturance, care, compassion, altruistic love, “niceness”), social intelligence (emotional intelligence, personal intelligence), citizenship (social responsibility, loyalty, teamwork), fairness, leadership, forgiveness and mercy, humility/modesty, prudence, self-regulation (self-control), appreciation to beauty and excellence (awe, wonder, elevation), gratitude, hope (optimism, future-mindedness, future orientation), humour (playfulness), spirituality (religiousness, faith, purpose). Self-esteem, resilience, hardiness are also regarded as positive personality characteristics (Peterson, Seligman, 2004).

It is suggested (Pressman & Cohen, 2005) that positive personality characteristics can affect illness through levels of stress hormones (e.g. positive personality characteristics predict lower levels of stress hormones) or through change of response to stress (e.g. positive personality characteristics prevent the acute response from becoming to chronic) (Pressman & Cohen, 2005). It is also believed that positive personality characteristics relates with better coping with stress (Nes & Segerstrom, 2006).

However, it is not clear how positive personal characteristics affect not only cognitive coping (stress coping strategies) but physiological reaction to stress (stressors) as well. For example optimism does not relate with better response to pain (Pecina et al., 2013) and physical stressor (cold water), but predicts better response to social stressor (public speaking) (Terrill, Ruiz, & Garofalo, 2010). Some findings indicate that the interaction of high optimism and high discrimination predicts worse response to stressors as compared with only high discrimination (Richman, Bennett, Pek, Siegler, & Williams, 2007) which in fact suggests that optimism may not always have a positive impact upon one’s health. It is possible that other positive personality characteristics may also relate not only with positive but with negative health outcomes as well.

So the aim of study is to analyse the links between positive personality characteristics and physiological response to stressors.

### **3. Research Questions**

The study is aimed at answering the research question how different positive personality characteristics affect human's physiological response to psychosocial and physiological stressors.

### **4. Purpose of the Study**

The purpose of study is to review the existing evidence about how different positive personal characteristics, such as optimism, altruism, straightforwardness affect physiological response to psychosocial and physiological stressors in humans?

### **5. Research Methods**

Systematic literature analysis included empirical articles which studied links between positive personality characteristics physiological response to stressors and were published from 1996 through 2016. Other criteria included accessibility to article and language: only articles in English. Data search was conducted in „PubMed“, Sciencedirect, Medline, Health source databases which generated 582 results, 7 from ahead were selected as matching the analysis criteria. The search was conducted by the following combinations of keywords: stressor\* AND physiolog\* AND respon\* AND trait\*. The search was conducted in abstracts of articles. Excluded articles were the ones which investigated physiological reactions not in humans (200), not physiological reactions (16), which investigated not positive personality traits (78), which investigated other phenomena than personality traits (34), literature reviews (13) and articles not in the English language (3).

### **6. Findings**

B. Turan (2015) investigated the importance of self-esteem to the amount of cortisol before expected, psychosocial stressor in 77, undergraduate students. Mean age of participants was 21. Exclusion criteria used were diseases of endocrine system, depression, anxiety, oncological diseases, use of corticosteroids, use of drugs and tobacco. Results revealed that higher self-esteem related with lower anticipatory cortisol reactivity in second session. However, at the first session (when public speech stressor actually happened) self-esteem did not affect the link between anticipatory cortisol and amount of cortisol during stressor, but higher self-esteem related with lower amount of anticipatory cortisol (in both sessions). The authors did not find the relationship between depression, fear of negative evaluation does not relate with cortisol reactivity during second session. According to these findings self-esteem did not affect cortisol reactivity during the stressor, and suggested that higher self-esteem decrease anticipatory reactivity of cortisol, and lower anticipatory cortisol reactivity is known to be beneficial for health (Turan, 2015).

E. Childs, T. White and H. de Wit (2014) assessed importance of positive and negative emotionality for physiological response to psychosocial – public-speech stressor in 125 individuals (56 males and 69 females). Participants mean age was 21; body mass index was between 19 and 29. Exclusion criteria were smoking more than 20 cigarettes per week, serious medical conditions, currently or at least a year ago diagnosed Axis-1 mental disorder, addiction disorder (including nicotine), abnormal electrocardiogram, use of prescribed medication, work at night shift and extra exclusion criteria for women was the use of oral contraceptive. The results showed, that higher tendency at social affiliation (as a form of positive emotionality) predicted lower peak cortisol increase and lower general cortisol increase as well as lower mean arterial blood pressure increase. However, higher tendency at social domination predicted higher general cortisol increase. Authors suggest that a tendency to social affiliation can be regarded as protective, and a tendency at social domination can be viewed as a risk factor for greater physiological response to psychosocial stressors. Authors did not evaluate the importance of coping strategies and regarded it as a limitation of the study.

M. Pecina et al. (2013) assessed how features of personality related with the **self-assumed** pain during placebo. Forty seven (19 males and 28 females) healthy participants entered the study. Mean age of participants was 26 years. A left-handed and smoking participant was removed from study. The study analysed psychological characteristics such as emotional, psychological and social well-being, optimism, satisfaction with life, ego-resiliency, altruism, straightforwardness. The results revealed that higher ego-resiliency, altruism and straightforwardness predicted better response to placebo and higher opioid system activation – i.e. participants with higher ego-resiliency, altruism and straightforwardness experienced lower pain because of a better reaction to placebo. Other psychological characteristics (optimism and well-being) did not affect the response to pain or opioid system activation. Authors suggest that stable personality characteristics could predict a better response to placebo and suggest replication of the results in clinical samples.

A.L. Terrill, J.M. Ruiz and J.P. Garofalo (2010) assessed how optimism affected the response to different types of stressors in 90 (46 males and 44 females) undergraduate students. Participants mean age was 20. Results showed that optimism did not predict physiological response to physical (cold water) stressor. However, higher optimism related to lower mean arterial pressure reactivity when imagining personally disgraceful moments of life, also optimism predicted faster systolic and mean arterial blood pressure recovery after self-disclosure task, but *not during* self-disclosure task. Authors suggest that optimism does not affect the response to physical, but affect the response to psychosocial stressors. Students' sample, alcohol and tobacco using were mentioned as limitations of the study.

E.E. Labbe and A. Fobes (2010) assessed the importance of spirituality to physiological response to psychological load task. Eighty (26 males, 54 females) students participated in the study. Participants' mean age was 18,50. Results revealed that spirituality predicted lower respiration rate before and during stress, but spirituality did not predicted skin conductance and heart rate. Low age of participants is mentioned as a limitation of study.

L.S. Richman, G.G. Bennet, J. Pek, I. Siegler and R.B. Williams (2007) assessed the links between discrimination, optimism and cardiovascular system response to stressors in 165 (71 white race and 94 black race) participants from community. Mean age of participants was 33,89 years. The exclusion

criteria were any physical and mental disorders and use of medication. Results revealed that participants which perceived his/her discrimination and optimism as high demonstrated higher diastolic blood pressure reactivity during psychosocial (anger-recall) stressor, i.e. their response to stressor was worse as compared with participants which were less optimistic. Laboratory setting was considered as a study limitation.

A.M., Sandvik, P.T., Bartone, S.W., Hystad, T.M., Phillips, J.F., Thayer, and B.H., Johnsen (2013) assessed links between hardiness and immunological response to stressors. Twenty two cadets from Royal Norwegian Navy participated in the study. Results revealed that participants with balanced hardiness profile (high scores in commitment, control, challenge) as compared to participants with misbalanced hardiness profile (high in commitment and control, but low in challenge) demonstrated more stable amount of InterLeukin-12. The levels of InterLeukin-4 decreased during stressor in the balanced group, but increased in the unbalanced group. In the unbalanced group of hardiness levels, InterLeukin-10 increased when the level of stress was high. Hardiness balanced group also showed increasing levels of neuro peptide Y when levels of stress increased. The results show that balanced hardiness response to stressors is more adaptive as compared to hardiness in an unbalanced group. The study limitations were small sample and homogenous group of military personnel.

Generalised results of review are presented in table 01.

**Table 01.** Generalised results of links between positive personal characteristics and physiological response to psychosocial and physical stressors

Positive personality characteristics	Psychosocial stressors	Physiological stressors
Hardiness	+	+
Self-Esteem	+	
Social affiliation	+	
Ego resiliency		+
Altruism		+
Straightforwardness		+
Optimism	+	-
Spirituality	+	
Social well-being		-
Emotional well-being		-
Psychological well-being		-

Note: + means significant (at .05 level) positive link between higher feature and more adaptive response to stressor; – means not significant link between level of a positive personal characteristic. Empty areas mean that no data was found in study.

## 7. Conclusion

Hardiness, self-esteem, social affiliation, ego resiliency, altruism, straightforwardness, optimism and spirituality predict better response to psychosocial stressors.

Ego resiliency, altruism, straightforwardness predict better response to physiological stressors.

Social, emotional, psychological well-being and optimism do not predict better response to physiological stressors.

## Acknowledgments

I would like to thank my doctoral advisor Loreta Gustainienė for help of preparing manuscript.

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