

THE ROLE OF PERSONALITY TRAITS IN POSTTRAUMATIC STRESS DISORDER (PTSD)

Nenad Jakšić¹, Lovorka Brajković¹, Ena Ivezić², Radmila Topić¹ & Miro Jakovljević¹

¹Department of Psychiatry, University Hospital Centre Zagreb, Croatia

²Psychiatric Hospital "Sveti Ivan", Zagreb, Croatia

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SUMMARY

Background: A number of studies have shown that although exposure to potentially traumatic events is common, development of PTSD is relatively rare, which is one of the reasons PTSD still remains a controversial psychiatric entity. The aim of this article was to provide an overview of the research on the role of personality traits in the vulnerability, resilience, posttraumatic growth and expressions associated with PTSD. Personality based approach represents a dimensional aspect of the transdisciplinary integrative model of PTSD.

Methods: We conducted a systematic search on PubMed, PsycINFO, and Academic Search Complete from 1980 (the year PTSD was first included in the DSM) and 2012 (the year the literature search was performed). Manual examination of secondary sources such as the reference sections of selected articles and book chapters were also conducted.

Results: Most of the reviewed studies dealing with personality traits as vulnerability and protective factors for PTSD examined the relationship between basic personality dimensions and severity of symptoms of PTSD. These studies have applied three types of methodological designs: cross-sectional, post-trauma and pre-trauma longitudinal studies, with latter being the least common option.

Conclusion: Finding that appears relatively consistent is that PTSD is positively related to negative emotionality, neuroticism, harm avoidance, novelty-seeking and self-transcendence, as well as to trait hostility/anger and trait anxiety. On the other hand, PTSD symptoms are negatively associated with extraversion, conscientiousness, self-directedness, the combination of high positive and low negative emotionality, as well as with hardiness and optimism, while posttraumatic growth shows inverse relation to most of these traits. Furthermore, a number of studies have confirmed the existence of three distinct personality-based subtypes of PTSD: internalizing, externalizing and low pathology PTSD. These findings may help in further uncovering etiological mechanisms and in building new strategies for prevention, identification and reduction of health risks among this trauma population, as well as facilitating potential posttraumatic growth. However, focusing on just a single dimensional perspective will unable us to generate comprehensive knowledge of the etiology, course and treatment of PTSD.

Key words: posttraumatic stress disorder - PTSD – personality – vulnerability – resilience - expression

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INTRODUCTION

The idea of trauma experience as the only or leading etiological factor in the development of PTSD has been rejected by empirical data (Johnson & Thompson 2008), adding to the fact that PTSD is still one of the most controversial diagnostic entities in psychiatry and in medicine in general (Jakovljević 1998, Brewin 2011, Jakovljević 2012). More specifically, epidemiological studies have documented high prevalence rates of exposure to traumatic events in the general population and confirmed that PTSD occurs following a wide range of extreme life events (e.g., Breslau et al. 1991, Kessler et al. 1995, 2005). Most important, though, are the consistent findings indicating that, although exposure to potentially traumatic events is common, development of PTSD is relatively rare, usually between 5 and 10% in general population (e.g., Davidson et al. 1991, Breslau et al. 1998, Creamer et al. 2001, Lloyd & Turner 2003, Kessler et al. 2005). Elucidation of the factors responsible for some people developing PTSD while others exposed to similar threatening events do not may inform

our understanding of key variables in the etiology of this condition, helping us in answering the longstanding question whether trauma reactions are the consequence of pre-trauma personality defects, or if psychotrauma largely overshadows the entire pre-trauma personality (Maercker et al. 1999). Previous studies have identified some pre-trauma and post-trauma variables of great importance in addition to the traumatic event itself, such as genetic factors, perceived lack of parental care, past history of trauma and psychological problems, unhealthy life styles, personality traits, intelligence, as well as post-trauma (and post-war) support, beliefs, expectations and attributions (Yehuda & McFarlane 1995, Jakovljević 2012, Jakovljević et al. 2012a). It has been shown that one of the factors that might help explain why only some traumatized people develop psychiatric illness, individual differences in personality traits, plays an important role in the development, outcome and formation of specific symptoms of PTSD (e.g., Fauerbach et al. 2000, Cox et al. 2003, Gil 2005, Engelhard & van den Hout 2007, Miller & Resick 2007, Wolf et al. 2012).

Personality traits are traditionally conceptualized as dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions across developmental periods and contexts (McCrae & Costa 2003). Advances in the field of personality have put more emphasis on the interface between personality and psychopathology, including PTSD. This dimensional model assumes there are individual differences in personality structure regarding their vulnerability or resilience to mental distress, in this case PTSD. It comprises three relevant steps in the psychotraumatization process: possible deficits in personality structure and functioning, exposure to stressful or traumatic events and abnormal reactions. For those who are on the extreme vulnerability end of the continuum, a smaller amount of stress or trauma is needed for mental disturbances to appear, while resilient individuals would have to experience more severe stress or trauma before they develop PTSD or some other psychiatric illness (Jakovljević et al. 2012b). Personality has been linked to affective dispositions, structural and biochemical systems in the brain and role in the etiology of psychopathology, while treatment options should be focused on helping individuals use their personality-based resources and strengths to increase personal well-being and restore resilience. Because of a lack of consensus regarding the basic dimensions of personality and their interrelationships, the personality and PTSD literature is based on studies using different personality models which differ in terms of the factor structure, number and definition of specific traits (Miller 2003). In the following section we will briefly mention and define the most commonly used structural personality models and their traits in the research field of PTSD and personality.

The five-factor model of personality (FFM) (Costa & McCrae 1992) is the most popular structural personality model, confirmed across virtually all cultures and fairly stable over time (McCrae & Costa 2003). In addition, research suggests that the Big Five traits have a physiological and genetic basis and the heritability of its dimensions appears to be quite substantial (Bouchard & McGue 2003, Ožura et al. 2012). The dimensions composing the 5-factor model are Neuroticism, Extraversion, Agreeableness, Conscientiousness and Openness to Experience, which encompass 30 lower-order facets.

The psychobiological model of personality is based on four temperament (Harm Avoidance, Novelty Seeking, Reward Dependence, Persistence) and three character dimensions (Self-directedness, Cooperativeness, Self-transcendence) (Cloninger et al. 1993). Temperament is considered to be biologically based emotional response patterns, such as fear, anger and attachment. Character is a developmental construct consisting of self-concepts about the values and goals that influence the significance of what is experienced. Whereas temperament refers to inborn emotional predispositions, character is related to our intentional

behavior repertoire (Cloninger et al. 1993, Svrakic & Cloninger 2010).

The broader three-factor model of personality is based on the work of Tellegen (1985) and comprises three higher-order dimensions: Positive emotionality/Extraversion (PEM), Negative emotionality/Neuroticism (NEM) and Constraint/Inhibition (CON). These dimensions are represented in other models of personality (Miller 2003), have substantial heritabilities (Robinson et al. 1992) and long-term stability in adulthood (Watson & Walker 1996). The three-factor model has been extensively investigated regarding the development and expression of PTSD (e.g., Miller 2003, Miller & Resick 2007, Wolf et al. 2012).

Based on previous empirical studies, the aim of this review was to update the field on the influence of personality traits on four related aspects of PTSD: vulnerability, resilience, posttraumatic growth (PTG) and behavioral expressions associated with PTSD. However, it is noteworthy to mention that the role of personality in PTSD falls into dimensional perspective and represents a part of the transdisciplinary integrative model of PTSD based on the seven perspective explanatory approach as well as on the method of multiple working hypotheses (Jakovljević et al. 2012a,b).

METHOD OF REVIEW

The literature search was aimed at identifying published evaluations of the influence of personality on PTSD. We focused on published, peer-reviewed English-language studies because we expected them to be the most methodologically rigorous and thus yield the strongest conclusions in regard to personality and PTSD. Relevant studies were identified through extensive, computerized database searches of PubMed, PsycINFO, and Academic Search Complete for articles published between 1980 (the year PTSD was first included in the DSM) and 2012 (the year the literature search was conducted), using the specific search terms 'posttraumatic stress disorder', 'PTSD', 'personality', and 'temperament'. To narrow the search, the titles and abstracts and, if necessary, the full articles were then examined in order to exclude the papers that did not report on the direct relationship between personality and PTSD. In order to ensure a thorough search procedure, manual examination of secondary sources such as the reference sections of selected articles and book chapters were also conducted. Furthermore, references were included that were known to the authors and were directly relevant to the review, but that had not otherwise been detected using the previous search strategies. Studies offering evidence representing expert opinion (such as case studies) were excluded on the basis that they appear low down on the 'hierarchy of evidence' adopted by the National Service Framework for Mental Health (Department of Health 1999). The investigation of the literature did not include published abstracts.

PERSONALITY TRAITS AS VULNERABILITY FACTORS

Generally, vulnerability factor refers to a measurable attribute of individuals, their interpersonal relationships, or their social and physical environments that increases the likelihood of negative or undesirable current or future outcomes (Layne et al. 2007). Therefore, a personality trait that demonstrates a positive association with PTSD in a sample of individuals who have experienced a traumatic event may qualify as a vulnerability factor.

Research findings on basic dimensions of personality

Most of the reviewed studies dealing with traits as vulnerability factors for PTSD examined the relationship between basic personality dimensions and severity of symptoms of PTSD. Despite growing evidence of the association between PTSD and personality, some questions still remain open, such as whether personality-based vulnerability factors for PTSD are unique or they are the same as those related to many other mental disorders (Jakovljevic et al. 2012a).

Several studies examined dimensions derived from the Eysenck's model of personality (e.g., Holeva & Tarrier 2001, Brodaty et al. 2004, Engelhard et al. 2006, Parslow et al. 2006, Wu et al. 2011): Extraversion/Introversion, Neuroticism and Psychoticism. Extraversion is characterized by being outgoing, social, talkative and high on positive affect. Neuroticism describes a tendency to react with strong emotion to adverse events. Individuals who are high on this dimension are more sensitive to stress because their responses are more rapid, more intense and slower to return to baseline. Conversely, those who are low on trait neuroticism find it easier to "shake off" stressful events (Paris 2000). Psychoticism is characterized by non-conformity, anger, hostility, irresponsibility and impulsiveness. In a cross-sectional study conducted on holocaust survivors, Brodaty et al. (2004) found that only higher neuroticism was associated with significant PTSD. The same was shown in a cross-sectional study on Chinese students after a snowstorm disaster (Wu et al. 2011). Similarly, this finding was confirmed in two longitudinal studies of young adults (Parslow et al. 2006) and women after miscarriage or stillbirth. On the other hand, both neuroticism and psychoticism were linked to PTSD in one cross-sectional study conducted on war veterans (Casella & Motta 1990). In their posttrauma prospective study on victims of traffic accidents, Holeva & Tarrier (2001) showed that both neuroticism and psychoticism were significantly correlated with posttraumatic symptoms.

A number of consulted studies examined the relationship between PTSD symptoms and personality dimensions according to the Five-factor model of personality (FFM) by Costa & McCrae (e.g., Talbert et

al. 1993, Hyer et al. 1994, Lawrence & Fauerbach 2003, Knežević et al. 2005, Chung et al. 2006, 2007, 2011). Two dimensions of the model correspond to Eysenck's model: Extraversion/Introversion and Neuroticism. Other dimensions are: Agreeableness, Conscientiousness and Openness to experience. Agreeableness is a tendency to be pleasant in social situation, conscientiousness includes traits like self-discipline, carefulness, thoroughness, self-organization and need for achievement, while openness can be defined as the tendency to be interested in new situations, new ideas and new experiences. Talbert et al. (1993) sorted Vietnam veterans into three groups based on trauma exposure level and found no significant difference among the personality profiles between them, but a normative profile was presented and it was characterized by an extremely high neuroticism score and an extremely low agreeableness score. In their cross-sectional study on persons with PTSD, Hyer et al. (1994) found that only neuroticism was significantly associated with PTSD. Knežević et al. (2005) conducted a longitudinal study on Yugoslavian students exposed to air attacks. While there was no significant correlation between personality traits and subsequent avoidance scores, openness to experience positively predicted intrusion scores 1 year after the attacks. In a posttrauma prospective study, Lawrence & Fauerbach (2003) obtained results which suggested that neuroticism was the most important personality dimension in predicting PTSD. Chung et al. (2006) examined the association between five personality traits and PTSD symptoms among older people after myocardial infarction. Regression analyses showed that higher neuroticism predicted reexperiencing and avoidance symptoms, while higher neuroticism and less agreeableness predicted hyperarousal symptoms. Chung et al. (2007) compared a no-PTSD group, a partial-PTSD group and a full-PTSD group of patients after myocardial infarction. Patients with full-PTSD were significantly more neurotic than those with no-PTSD and partial-PTSD. Patients with full-PTSD were less agreeable than patients with no-PTSD. There were no significant differences in extraversion, openness to experience and conscientiousness. Nevertheless, several studies established a link between low extraversion and PTSD outcomes (e.g., Fauerbach et al. 2000, Dörfel et al. 2008). To conclude, the overall findings from these studies suggest that neuroticism accounts for the risk of developing PTSD symptoms. As for other personality dimensions, the results are inconsistent and further research is needed.

Four temperament and three character dimensions from the Psychobiological model of personality by Cloninger are often a subject of research in studies dealing with predictive factors of PTSD. The four dimensions are: Harm Avoidance (a tendency to respond intensely to previously established signals of adverse stimuli and to learn passively to avoid punishment, novelty, and non-rewarding situations), Novelty Seeking (a tendency to respond with intense

excitement to novel stimuli or potential relief from punishment), Reward Dependence (a tendency to respond intensely to signals of reward, especially social reward, and to maintain behavior previously associated with reward or with relief from punishment) and Persistence (persevering, ambitious vs. easily discouraged, underachieving) (Gil 2005). Character dimensions are: Self-directedness (eliable, purposeful vs. blaming, aimless), Cooperativeness (tolerant, helpful vs. prejudiced, revengeful) and Self-transcendence (self-forgetful, spiritual vs. self-conscious, materialistic). Richman & Frueh (1997) compared data of Vietnam veterans suffering from combat-related PTSD with normative data and veterans were found to be high on harm avoidance, low on reward dependence, and high on novelty seeking. High harm-avoidance and high novelty-seeking scores were predictive of increased PTSD severity. Similarly, Wang et al. (1997) found substantially elevated novelty seeking and harm avoidance scores as well as moderately lower reward dependence scores in the PTSD Vietnam veterans compared to national norms. In a longitudinal study on undergraduate students exposed to a terrorist explosion (Gil 2005), regression analysis showed that harm avoidance was positively associated with the risk for developing PTSD, and that novelty-seeking was negatively associated with this risk. North et al. (2008) conducted a longitudinal study and found that symptoms of PTSD are related to harm avoidance, self-transcendence, and self-directedness. In a cross-sectional study, Yoon et al. (2009) showed that patients with PTSD achieve significantly higher scores on harm avoidance and self-transcendence and lower scores on self-directedness and cooperativeness. Evren et al. (2010) confirmed that persons with PTSD have higher mean scores of novelty seeking, harm avoidance and self-transcendence. A study of bombing survivors (North et al. 2012) showed that postbombing PTSD was associated with low self-directedness and low cooperativeness, and also with high self-transcendence and harm avoidance in most configurations. Finding that appears relatively consistent in studies of different designs, carried out on different samples, is that PTSD is related to high harm avoidance, novelty-seeking and self-transcendence, while for other personality dimensions, such unambiguous conclusion cannot be made.

Several studies were based on the Three-factor model derived from Tellegen's conceptualization of these dimensions: Positive emotionality/Extraversion (PEM), Negative emotionality/Neuroticism (NEM) and Constraint/Inhibition (CON). PEM refers to individual differences in the capacity to experience positive emotions and tendencies towards active involvement in the social and work environments. It corresponds to the dimension of Extraversion in Eysenck and Costa & McCrae models of personality. NEM is orthogonal to PEM and refers to dispositions toward negative mood and emotion and a tendency towards adversarial interactions with others. It is synonymous with Neuroticism

in other before mentioned models. CON, also called Social inhibition (SI), involves tendencies anchored by planfulness vs. spontaneity, restraint vs. recklessness, and harm-avoidance vs. risk-taking. It has been referred to by other theorists as psychoticism (Eysenck) and novelty-seeking (Cloninger). High NEM is assumed to be the primary personality risk factor for the development of PTSD whereas low CON and low PEM serve as moderating factors that influence the form and expression of the disorder through their interaction with NEM (Miller 2003). Bramsen et al. (2000) studied the contribution of predeployment personality traits to the development of symptoms of PTSD in individuals involved in military peacekeeping activities. Only NEM contributed to the prediction of PTSD symptom severity. Similarly, in their cross-sectional study on active duty officers, Maia et al. (2011) found that only NEM has been related to an impaired capacity to regulate negative emotions and to be associated with increases in the duration of distressing emotional and physical responses to traumatic situations. Kunst (2011) explored the differential association between affective personality type and PTSD symptom severity in victims of violence. Participants were classified as high affective (e.g., high positive affectivity (PEM) and high negative affectivity (NEM)), self-actualizing (e.g., high PEM and low NEM), self-destructive (e.g., low PEM and high NEM) and low affective (e.g., low PEM and low NEM). Results indicated that the self-destructive and high affective personality styles were strongly associated with increased PTSD symptoms severity. Low CON was implicated as a possible risk factor for the development of PTSD in two longitudinal studies. O'Toole et al. (1998) reported that veterans with diagnosis of combat-related PTSD were more likely to have had premilitary criminal records and symptoms of antisocial personality disorder at the time of military enlistment. Schnurr et al. (1993) reported that, compared to those with no PTSD symptoms, Vietnam veterans who endorsed any lifetime PTSD symptoms produced higher scores on the MMPI Psychopathic Deviate scale (which is associated with low CON) prior to enlistment. Based on these findings, it is concluded that NEM is associated with PTSD symptoms, while the role of PEM and CON is yet to be clearly defined by future research.

Research findings on Type D (distressed) personality

The concept of type D (distressed) personality was developed by Denollet et al. (1995, 1996) and represents a personality configuration of high NEM and high SI, personality dimensions from the before mentioned three-factor model of personality. According to Denollet and colleagues, the combination of high scores on both traits renders individuals at risk of developing health-related problems and not a high score on NEM alone. SI has been suggested to act as a maladaptive coping

strategy in overcoming the psychological burden of distress that follows stress exposure. Therefore, SI is a moderator, such that prevalence of PTSD symptoms for individuals high on NEM but low on SI is less than for individuals high on both components.

Majority of research on the predictive validity of Type D personality focused on cardiac patients exclusively (e.g., Pedersen & Denollet 2004, Wikman et al. 2008, Habibović et al. 2012). Pedersen & Denollet (2004), in their cross-sectional study, showed that type D personality is associated with the risk of PTSD. Similarly, Habibović et al. (2012) confirmed this independent association using a posttrauma prospective design. On the other hand, Wikman et al. (2008) found that type D personality did not predict PTSD symptoms when controlling for prior psychological symptoms.

Several recent studies examined the relationship between type D personality and PTSD symptoms in non-cardiac samples. One cross-sectional study on victims of violence (Kunst et al. 2011) showed that type D subjects reported more severe PTSD symptom levels than those characterized by high NEM /low SI or low NEM. In multivariate analyses, type D personality was associated with an increased risk of probable PTSD above and beyond background variables, while high NEM /low SI was not. Contrary to this, the longitudinal study by Rademaker et al. (2010) showed that, among Dutch soldiers, NEM was a significant predictor of PTSD symptoms, while SI and type D personality did not add to the amount of explained variance in post-deployment PTSD scores over the effects of childhood abuse, NEM and prior psychological symptoms. Similarly, in a cross-sectional study on earthquake survivors, although both NEM and SI were significantly associated with PTSD symptoms, regression analysis revealed that only NEM contributed significantly to explaining the variance of PTSD (Zhang & Ho 2011). Obviously, the results of these studies are inconsistent and more research is needed to clarify the role of type D personality in the development of PTSD symptoms.

Research findings on specific personality traits

Since aspects of aggression and hostility are also symptoms of PTSD, several authors assumed that the symptoms of PTSD may be associated with trait hostility. Indeed, van Zuiden et al. (2011), in a longitudinal study of male soldiers deployed to Afghanistan, showed that pre-deployment high hostility represented intrinsic vulnerability for development of PTSD symptoms after deployment. The same finding was obtained in another longitudinal study, conducted on professional firefighters (Heinrichs et al. 2005). Ouimette et al. (2004) examined anger/hostility as a possible mediator and moderator of PTSD and health status among a sample of medical patients. Findings of this cross-sectional study indicated that trait anger partially explained the association between PTSD and poorer general health perceptions.

Trait anxiety refers to the general tendency to perceive stressful situations as dangerous or threatening. Individuals with high trait anxiety have a sensitive autonomic system, which indicates that they respond intensely to situations of trauma (Marais & Stuart 2005). Their arousal levels take longer to normalise, and they start at a higher baseline level of arousal. Therefore, it is logical to assume that high trait anxiety is likely to lead to PTSD symptoms after exposure to a disaster. Studies have confirmed this assumption. For example, in their cross-sectional study of undergraduate students, Collimore et al. (2008) examined the impact of trait anxiety and media exposure on PTSD symptoms, following a remote traumatic event. Regression analyses revealed that trait anxiety was a significant predictor of PTSD symptoms. This was similar to results obtained on Dutch war veterans (Hovens et al. 1994). Hensley & Varela (2008) conducted a posttrauma prospective study which examined the relationships between trait anxiety, anxiety sensitivity, PTSD symptoms and somatic complaints following a major hurricane. Trait anxiety was significantly related to PTSD symptoms above and beyond exposure to the hurricane, and certain factors of anxiety sensitivity interacted with trait anxiety to predict PTSD and somatic symptoms.

PERSONALITY TRAITS AS PROTECTIVE FACTORS

In the most basic sense, resiliency has been defined as the ability to adapt and cope successfully despite threatening or challenging situations (Agaibi & Wilson 2005). In the context of disaster trauma, psychological resilience may present as distress (“bending”) without succumbing to psychiatric illness (“breaking”) (North et al. 2008). Resilient individuals are not necessarily unaffected by disaster, but rather will adapt more easily to adverse events and be less vulnerable to psychiatric illness.

Basic dimensions of personality

As stated in the section on vulnerability factors, some studies have pointed to the significant association between “positive” personality dimensions and symptoms of PTSD, in a sense that a lower score on these dimensions represents a risk factor for PTSD. Accordingly, it can be assumed that higher scores on the same dimensions represents a protective factor for developing PTSD. Indeed, several studies found positive correlation between extraversion and PTSD resilience (e.g., Fauerbach et al. 2000, Lauterbach & Vrana 2001, Campbell-Sills et al. 2006). Conscientiousness is also positively related to resilience (Campbell-Sills et al. 2006), as well as self-directedness (Ghazinour et al. 2003, North et al. 2008). Similarly, Kunst et al. (2011) found that “self-actualizing personality” (high positive affectivity and low negative affectivity) is associated with posttraumatic growth. Nevertheless, it is worthy to

mention a longitudinal study of Yuan et al. (2011) who found that positive personality dimensions, assessed with the Big Five Inventory, were not associated with lower PTSD symptoms.

Hardiness

Hardiness is conceptualized as a constellation of personality characteristics that function as a resilience resource during encounters with stressful life events (Miller 2003). Hardy individuals tend to view potentially stressful situations as meaningful and interesting (commitment), appraise stressors as changeable (control), and see change as a normal aspect of life and an opportunity for growth (challenge).

Several cross-sectional studies have found relationships between hardiness and PTSD. Bartone (1999) found that high-hardy war veterans were less symptomatic than low-hardy veterans and that this difference was more pronounced for individuals reporting the highest levels of combat exposure. Similarly, Sutker et al. (1995) found that hardiness, particularly the commitment subscale differentiated veterans with and without PTSD. Therefore, inclinations to involve oneself in and experience purposefulness in activities may protect against the negative effect of stressful events. The study of King et al. (1998) revealed evidence of a direct negative association between hardiness and PTSD symptom severity among veterans as well as an indirect effect of hardiness on PTSD mediated by social support, meaning that hardy individuals were more likely to utilize support from others effectively, which was associated with lower PTSD severity. Zakin et al. (2003) examined the relationship between hardiness and long-term distress among Israeli prisoners of war and combat veterans. The results showed that hardiness was associated with low levels of symptoms reported.

Optimism

Dispositional optimism can be defined as the generalized expectancy for positive outcomes. Several studies dealing with optimism as protective factor for PTSD symptoms started from the assumption that optimistic persons might be more inclined than pessimists to derive a sense of benefit from adversity. For example, in a cross-sectional study on soldiers from an active-duty brigade combat team, Thomas et al. (2011) found that soldiers higher on dispositional optimism showed weaker relationships between combat exposure and PTSD symptoms, and between deployment demands and PTSD. Optimism is related to the flexible use of adaptive coping strategies with regard to the controllability of stressors (Solberg Nes & Segerstrom 2006) and is considered a predictor of perceived capability to manage the demands of a potentially traumatic event (Benight & Bandura 2004). The role of optimism in health settings has been documented as being central to recovery and adjustment

(Bostock et al. 2009). It correlates with acceptance, lack of denial and behavioral disengagement, social support seeking, planning, and positive reinterpretation. However, Segerstrom (2005) suggested that optimism improves immunity when stressors are relatively controllable but inhibits immunity when stressors are more persistent and uncontrollable. This may perhaps be due to optimists' tendency to continue to engage, rather than disengage, in the face of controllable stressors.

PERSONALITY TRAITS AND POSTTRAUMATIC GROWTH (PTG)

Despite a growing body of literatures and philosophies conveying the message that there is personal growth after life-threatening event or adversity (Tedeschi & McNally 2011), the field is still dominated by pathogenic and deficit-oriented paradigms (Jakovljević 2012, Jakovljević et al. 2012a). Generally speaking, posttraumatic growth (PTG) refers to the development of positive changes and outlook following trauma, with its focus on five major aspects being concluded based on previous work: improved relationship with others, increased personal strength, identification of new possibilities, positive spiritual changes, and increased appreciation of life (Tedeschi & Calhoun 1996, 2004). PTG has been observed in various trauma-exposed civilian populations, including survivors of serious medical illnesses, rape and disasters as well as bereaved individuals (Linley & Joseph 2004, Tedeschi & Calhoun 2004, Zoellner & Maercker 2006, Yu et al. 2010, Svetina & Nastran 2012), and individuals who endured military combat (Aldwin et al. 1994, Feder et al. 2004).

According to Tedeschi & Calhoun's (2004) model of PTG, personality factors represent an important class of variables that predict PTG. Indeed, in their literature review of PTG, Linley & Joseph (2004) found consistent support for the positive relationship between PTG and extraversion, openness to experience, agreeableness and conscientiousness. Furthermore, the personality variables self-efficacy, hardiness, self-esteem and optimism were also positively associated with PTG. Positive affect was consistently positively associated with PTG, whereas negative affect was consistently negatively associated, due to the negative correlation of neuroticism and PTG. Most of the reviewed studies examined the relationship between optimism and PTG. The tendency of dispositional optimists to overcome stressful experiences, to engage in adaptive coping styles, and maintain a generalized expectancy of a positive outcome seems particularly relevant for PTG to develop (Bostock et al. 2009). Accordingly, meta-analytic reviews of Helgeson et al. (2006) and Prati & Pietrantonio (2009) found that PTG was related to greater optimism. Nevertheless, findings of the review of Bostock et al. (2009) indicated that the relationship between PTG and optimism is not so clear. According to Tedeschi & Calhoun (2004), PTG and optimism may be distinct concepts and optimism may

promote growth through its effects on threat appraisal and adaptive coping strategies (positive reappraisal, active coping, and seeking support coping) (Zoellner & Maercker 2006).

PERSONALITY TRAITS AND EXPRESSION OF PTSD

In the last two decades a considerable amount of research has been conducted in order to investigate the basic personality processes underlying psychiatric disorders. Different studies examining the latent structure of mental illness suggest that psychiatric symptoms fall along two personality dimensions termed internalizing and externalizing (Krueger et al. 1998, 2001, Kendler et al. 2003, Watson 2005, Kotov et al. 2011). Internalizers are described as individuals who display their stress inwardly and demonstrate high negative emotionality (NEM) and low positive emotionality (PEM). On the other hand, externalizers have a tendency of displaying their distress outwardly and are likely to react in an impulsive, aggressive way with low levels of constraint (CON) in their decision-making and behavior. For example, Krueger et al. (2001) showed that diagnoses of antisocial personality disorder, alcohol and drug dependence were more linked to externalizing personality factor, while major depressive disorder and some anxiety disorders were more associated with internalizing personality factor.

This model has been applied to PTSD in order to elaborate the issues of heterogeneity in the manifestation of posttraumatic symptomatology and patterns of comorbidity (Miller 2003, Wolf et al. 2010, Domschke 2012). It was hypothesized that NEM is the primary temperamental risk factor for PTSD, while PEM and CON influence the expression of PTSD. Subsequent cluster and latent class analytic studies, using several self-report measures of personality and psychopathology, have confirmed three distinct personality-based subtypes of PTSD: internalizing, externalizing and 'simple' PTSD (Miller & Resick 2007, Sellbom & Bagby 2009, Flood et al. 2010, Forbes et al. 2010, Rielage et al. 2010, Wolf et al. 2010, 2012). Internalizers are defined by high NEM and low PEM, they display problems in the areas of depression, anxiety, hypochondriasis, social avoidance and withdrawal, and they also exhibit features of schizoid and avoidant personality disorders. Externalizers are defined by high NEM and low CON, they show problems in the domains of impulsivity, aggression, delinquency, and substance abuse, including features of antisocial, borderline, histrionic and narcissistic personality disorders. Flood et al. (2010) found higher risk for all cause and behavior cause mortality in these two subtypes; both externalizers and internalizers were more likely to die from cardiovascular causes and externalizers were more likely to die of substance-related causes. Low pathology or 'simple PTSD' subtype is characterized by normal range personality scale scores

and less severe psychiatric disturbances, including relatively few comorbid diagnoses. Relative to the other subtypes, this group appears to have scores reflective of more stable emotional and social functioning, despite their PTSD diagnosis. It is noteworthy to mention that these studies have been performed using both male and female samples of military veterans and sexual assault survivors, which makes this typology generalizable across different trauma populations. One difference between these samples was the lower proportion of female externalizers, in line with prior evidence of low prevalence of externalizing disorders among women (Kessler et al. 1993, 1997). Furthermore, one study (Rielage et al. 2010) obtained a three-cluster solution using the Big Five Inventory, which supports the robustness of the internalization-externalization dimension and extends the notion that this dimension could be derived from longer personality scales. Although Forbes et al. (2010) found evidence for four possible subtypes (internalizing factor was subdivided into two classes), this small discrepancy was attributed to high levels of psychoticism among a subset of internalizers, and the authors concluded that the three-subtype model was still the most meaningful one. One of the key questions here is whether certain subtypes of PTSD are more responsive to specific treatment methods and what role do ethnicity and culture play in the manifestation of these symptoms (Jakovljevic et al. 2012a).

CONCLUSIONS

In the last two decades there is an ongoing investigation of the factors responsible for some people developing PTSD while others exposed to similar threatening events do not. It has been shown that one of these factors, individual differences in personality traits, plays an important role in the development and formation of specific symptoms of PTSD. Most of the reviewed studies dealing with personality traits as vulnerability and protective factors for PTSD examined the relationship between basic personality dimensions and severity of symptoms of PTSD. Finding that appears relatively consistent in studies of different designs, carried out on different samples, is that PTSD is positively related to basic personality dimensions of negative emotionality, neuroticism, harm avoidance, novelty-seeking and self-transcendence, as well as to specific personality traits of hostility/anger and anxiety. As for other personality dimensions and traits, the results are inconsistent and further research is needed. On the other hand, PTSD symptoms are usually negatively associated with basic personality dimensions of extraversion, conscientiousness, self-directedness, the combination of high positive and low negative emotionality, as well as with specific personality traits of hardiness and optimism, while posttraumatic growth shows inverse relation to most of these traits. Despite the growing evidence of the association between PTSD and personality, some questions still remain open, such

as whether personality-based vulnerability factors for PTSD are unique or they are the same as those related to many other mental disorders. Furthermore, a number of studies have confirmed the role of negative emotionality, positive emotionality and constraint in the expression of PTSD symptoms. These cluster and latent class analytic studies, using several self-report measures of personality and psychopathology, have obtained three distinct personality-based subtypes of PTSD: internalizing, externalizing and low pathology PTSD. Whether different treatment methods should be used for these subtypes and what role do ethnicity and culture play in the manifestation of PTSD symptoms, are issues that require further investigations. The identification of personality-based risk and protective factors as well as understanding variations in PTSD symptom expression may help in uncovering etiological mechanisms and in building new strategies for prevention, identification and reduction of health risks among this trauma population, as well as of facilitation of potential posttraumatic growth. Treatment options should be focused on helping individuals use their personality-based resources and strengths to increase personal well-being, restore resilience and develop personal functioning that possibly exceeds pre-trauma levels.

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Correspondence:

Nenad Jakšić, MP

Department of Psychiatry, University Hospital Centre Zagreb

Kišpatičeva 12, 10000 Zagreb, Croatia

E-mail: nenad_jaksic@yahoo.com