ORIGINAL ARTICLE

Pol J Aviat Med Bioeng Psychol 2021; 27(1): 20-31
DOI: 10.13174/pjambp.28.02.2024.03

SENSATION SEEKING AND POSTTRAUMATIC STRESS LEVELS IN POLISH SOLDIERS FIGHTING IN AFGHANISTAN

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Source of support: The research reported was supported by a Military Institute of Medicine grant.

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Introduction: The central aim of the present study was to address whether sensation seeking traits are related to severity of posttraumatic stress disorder symptoms (PTSD) in soldiers conducting military operations in Afghanistan, and whether this effect is moderated by selected personality traits and strength of traumatic stimulus. The study was drawn upon the Regulatory Theory of Temperament by Strelau, in reference to which it can be assumed that people characterized by both the highest and the lowest levels of sensation seeking traits would be at greater risk of suffering from PTSD symptoms.

Methods: 125 Polish soldiers of the Armored Cavalry Brigade who took part in military mission in Afghanistan in 2013/2014 filled in the following psychological questionnaires: PTSD Questionnaire (PTSD – C Scale); Impact of Event Scale (IES); Sensation Seeking Scale (SSS – V); Impulsiveness Questionnaire (IVE); Eysenck Personality Questionnaire Revised (EPQ-R); Combat Exposure Scale (CES).

Results: Results indicated no direct relationship between sensation seeking and the severity of posttraumatic stress among Polish soldiers participating in combat operations in Afghanistan. However, after controlling for the effect of neuroticism and impulsiveness in the studied group of soldiers, the sensation seeking appeared to be a strong predictor of PTSD symptoms.

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Conclusion: The study provided information on the feature of sensation seeking which regardless of its severity should not be treated as a predictor of emotional disturbances. However under certain conditions created by personality variables the relationship between the sensation seeking and symptoms of posttraumatic stress can occur. Possible explanatory mechanisms refer to the urge to immediate reduction the emotional tension. Among the personality types, individuals with high anxiety and high impulsivity would be most susceptible to the consequences of traumatic stress.

Keywords: sensation seeking, PTSD, impulsivity, individual differences

INTRODUCTION

The risk of developing post-traumatic stress disorder (PTSD) is associated with numerous temperamental and personality factors. Many of them, including neuroticism or emotional clarity, are correlated with other emotional disturbances. However, some of them refer to the formal aspects of behavior which make them neutral from the clinical perspective. The impact of these temperamental traits, which tend to determine individual mobilization when facing extreme stimulus, is far from evident. One of them is sensation seeking.

The concept of sensation seeking refers to the tendency to seek or avoid stimulation. According to Marvin Zuckerman [39], sensation seeking is a temperamental trait that is associated with the need to search for different, new, complex and intense experiences with a willingness to take part in various types of risk. This trait is associated with the area of differential psychology and does not include any aspects related directly to difficulties in emotional adaptation. However, the development of mental disorders is usually triggered by the interaction of various factors, and sensation seeking can often be one of them.

The modifying role of sensation seeking becomes more evident when taking into account the classification of psychopathological symptoms. Sensation seeking most clearly refers to the excitement – slowing down dimension and therefore its impact seems to be apparent when it comes to the disorders in which this dimension plays a vital role. Hence the connection between sensation seeking and bipolar or addiction disorders occurs.

When examining the moderating function of sensation seeking in the context of the development of PTSD, attention should be paid to specific traits which make post-traumatic stress disorder differ from other mental disorders. The first relates to the fact that the level of traumatic stress is extreme, while the second relates to the long-term development of the disorder, during which symptoms may be latent at some stage.

This second aspect was pointed out by Neria et al. [16], who concluded that most of the research on this topic focused on immediate or short-term stress response. Consequently, only the effect of the impact of sensation seeking in the context of adaptation to current stressful life experiences was usually analyzed. The results of this analysis situated the sensation seeking in the area of high-stress tolerance.

Previous research more often perceived sensation seeking as a protective factor in the context of PTSD proneness [16,21,33]. The explanations for these findings refer to the activation of both internal and external coping strategies, which are specific to high-sensation-seekers. These individuals are willing to focus on the problem, which results in a more benign emotional response. On the contrary, individuals with low sensation seeking use a mechanism of denial, which leads to the perception of the stressful situation as more threatening and unpredictable than it actually is.

Neria [16] indicated that sensation-seekers during wartime were willing to take the initiative as well as risk their lives in the face of danger. Compared with low sensation seekers, they developed less severe PTSD symptoms. At the same time, he discovered that although high and low sensation-seekers differed in their adaptation to war conditions, they did not show significant differences in the overall level of emotional distress. It was only the intensity of the stimulus that made the difference in tolerance to stress, causing high sensation-seekers to trigger more creative and flexible thinking, which was a protecting factor during exposure to the traumatic experience.

However, in the literature on the impact of sensation seeking, opposing views on the development of post-traumatic symptoms can also be found. These approaches point out that under some circumstances, the tendency to sensation seeking can affect the difficulty of "dealing" with traumatic experience. Yehuda and MacFarlane [34] noticed that individuals with high sensation

seeking were more exposed to traumatic experience due to the tendency to seek activity associated with exposure to stress.

Moreover, Van der Kolk [29] indicated that survivors of traumatic experiences tended to re-engage in a situation with high stress intensity and hypothesized about the "compulsion of repeat" in reference to exposure to trauma, which links sensation seeking to posttraumatic stress disorder. According to the "re-exposure hypothesis", numerous experiences connected with extreme levels of stress can lead to the addiction to trauma, causing individuals to intensely seek further such experiences This process constantly exposes them to stress, which eventually leads to emotional disorders.

Joseph [14] noted that the re-exposure hypothesis had rarely been covered in empirical data. Therefore, he recognized sensation seeking as a multidimensional concept and suggested a reference to Eysenck's concept of impulsiveness. Eysenck's theory distinguished two types of impulsiveness: one that is associated with risk awareness (venturesomeness) and one that does not take into account its consequences (impulsiveness). According to Joseph et al. [14], this distinction is significant, because it is the ability to assess risk that determines the susceptibility to the development of PTSD symptoms. Impulsive people who exhibit reduced awareness of risky behavior are far more exposed to trauma. The study by Volkert et al. [31] seemed to confirm this idea, as the delay in risk assessment associated with sensation seeking was characteristic of individuals with PTSD symptoms.

Summarizing, we concluded that studies on the relationship between sensation seeking and PTSD have not yet yielded unequivocal results. First of all, many empirical data indicated that increased tolerance to intense stimulation could be treated as a mechanism protecting against the development of trauma-related disorders. On the other hand, the tendency to seek stimulation was associated with an increased risk of exposure to traumatic experiences, which, considering the mechanisms of post-traumatic stress disorder development, may cause it to become a risk factor.

The concepts of posttraumatic stress development [2,6] indicated that a key signal of difficulty in adapting to intense stressor was associated with a persistent gap between the emotional and cognitive domains, leading to the formation of intrusions. Horowitz [13] specified this process as an inability to accept information about trauma. Brewin et al. [2] pointed to a situationally activated memory system containing memories that cannot be verbalized. In addition, Ehlers and Clark's model [6] referred to traumatic memories as separated from biographic data.

At the same time, many researches dealing with specific phenomena associated with PTSD also pointed out the relationship between emotion regulation and the development of symptoms. It was found, among other things, that the existence of the dissociation during a traumatic event led to the risk of increased symptoms [18]. Similarly, emotion-focused coping strategies were usually associated with greater susceptibility to trauma [23]. Moreover, Boden et al. [1] found in their study that people with PTSD symptoms were used to applying avoidance strategies and thus did not sufficiently adapt the cognitive mechanisms of coping with trauma.

What we have learned from the Theory of temperament [25] is that its role in the emotion regulation process is indisputably ponderable. Strelau [22] also noticed that the significance of temperamental factors increases when an individual is exposed to extremely difficult situations. In this study, we proposed the Regulative Theory of Temperament (RTT) as a theoretical basis to clarify the relationship between sensation seeking and posttraumatic stress.

According to RTT [25], temperament regulates human behavior during stressful situations, and therefore can affect the development of traumatic stress in two ways. Firstly, by increasing sensitivity to traumatic experiences and secondly by increasing the frequency of such experiences [22]. Strelau [25] also indicated the significance of an adequate level of activation during exposure to stressful situations. It is precisely the increased level of activation that is often associated with the risk of greater severity of PTSD symptoms. Increased level of activation arises as a result of a tendency to overstimulate, which consists of the interaction of two temperamental features of emotional reactivity and activity. According to RTT [25], both these factors are separate.

Increased level of activation can appear both as a result of inner predispositions in the form of a certain intensity of the sensation-seeking trait, and as being due to the emotional consequences of this severity. Thus, in the domain of sensation-seeking features, an increased level of activation can occur due to two processes. In the first, people with low sensation seeking personalities are constitutionally less resistant to excessive external stimulation, as is the case with highly reactive people. In the second case, however, an individual with high sensation seeking trait will tend to be exposed to situations of excessive stimulus value.

A positive correlation between emotional reactivity and the severity of PTSD symptoms was obtained in a flood survivors study [22], in the group of survivors of a mining disaster [23], and among survivors of traffic accidents [35]. Similar relationships were also found by Oniszczenko [17] in his study among the population of uniformed services: firefighters, soldiers and policemen.

However, according to Strelau [25], sensation seeking is associated not only with emotional reactivity, but also with activity, as Zuckerman [41] differentiates individuals into seeking and avoiding stimulation based just on their activity. Moreover, Zuckerman's definition of a sensation-seeking trait includes a motivational aspect for specific life activities [40]. At this point, we should remember the assumption of RTT, according to which, despite obvious mutual relationships, reactivity and activity are two separate temperament traits [25]. Thus, the risk of developing symptoms of traumatic stress not only depends on the emotional reactivity trait but also on the frequency and intensity of the reactivity state, which is associated with the level of activity.

The accumulation of traumatic stimuli provides powerful stimulation to the war participant [5]. It can therefore be assumed that sensation seeking among members of armed forces plays an important role in the context of stress resilience. On the one hand, sensation seeking is perceived as a factor conducive to antisocial behavior during combat duties, such as unnecessary risk-taking [10,11]. On the other hand, there are reports of a positive relationship between adventure seeking and effectiveness on the battlefield [30]. Research conducted among Danish soldiers deployed in Afghanistan [19] found no correlation between sensation seeking and the severity of psychopathological symptoms.

Considering that war conditions usually mean prolonged exposure to trauma, it can be assumed that the way in which sensation seeking affects the level of posttraumatic stress in soldiers depends on the mechanisms of stimulation regulation described by Strelau's Regulatory Theory of Temperament [25].

The Present Study

Based on Zuckerman's theory and the regulatory theory of temperament (RTT), it was assumed that there is a relationship between sensation seeking and the level of posttraumatic stress. Since sensation seeking is related to high activity and low emotional reactivity, it was assumed that this relationship is curvilinear, in which individuals with the highest and lowest sensation seeking would be most exposed to the risk of posttraumatic stress symptoms. It was also assumed that the relationship between sensation seeking would be moderated by factors related to the severity and type of the traumatic stimulus, and by factors related to the significance that individuals attribute to this experience as a result of their personality traits.

According to RTT, the development of posttraumatic stress is preceded by an increased level of activation. However, the level of activation is affected not only by temperament traits, but also by the power of the traumatic stimulus and personality traits. In the theoretical context of sensation seeking [14], the level of activation is also correlated with impulsiveness. Therefore, it is reasonable to ask a question about determining the moderation of factors, such as the strength of the traumatic stimulus, the level and type of impulsiveness, and personality traits for the relationship between the sensation seeking and posttraumatic stress.

METHODS

Participants

The sample was formed from 125 soldiers of the Polish Armored Cavalry Brigade in Świętoszów participating in military operations in Afghanistan (14th PKW shift). The Armored Cavalry Brigade is stationed in the Świętoszów garrison in the Lower Silesian Voivodeship and is part of the 11th Lubuska Armored Cavalry Division. Brigade soldiers have participated in military missions outside Poland since 2000, including four shifts in Iraq and three shifts in Afghanistan. This study concerned soldiers who participated in the 14th shift in Afghanistan, which numbered 1,000 people, with the core being soldiers from Świętoszów.

Participants were between 21 and 43 years old. The average age of the research group was 32.8 years. The vast majority (80%) had secondary education; 10% higher education, 8% vocational education. The study group consisted solely of men.

MEASURES

PTSD – C

The PTSD Questionnaire: Factorial Version (abbreviation in Polish: PTSD-C); Zawadzki et al. [36]. This inventory contains 30 items that can be divided into three scales, as identified through exploratory factor analysis: Intrusion/Arousal (15 items); Avoidance/Numbing (15 items); and a Global Scale

(all items). The Intrusion/Arousal scale refers to persistent re-experiencing of a traumatic event, causing chronic symptoms of hyperarousal not present before. The Avoidance/Numbing scale refers to avoidance of stimuli associated with the trauma, causing decreased involvement in significant life activities and decreased capacity to feel certain feelings. Participants are asked to report on four-point Likert-type scales how often they experienced a given thought, behavior, or emotion related to the traumatic event in the past several months. Cronbach's α, for the Intrusion/Arousal scale, the Avoidance/Numbing scale, and the Global scale are .96, .92, and .93, respectively.

Impact of Event Scale Revised (IES - R)

Post-traumatic psychological symptoms were assessed using the IES-R, which is a 22-item self-rating questionnaire with a four-point Likert scale ranging from "never" to "often." The IES-R consists of three subscales: Intrusion with seven items; Avoidance with eight; and Hyperarousal with seven items. Cronbach's α is 0.75).

Sensation-Seeking Scale (SSS-V)

Sensation-seeking traits were measured through Zuckerman, Eysenck and Eysenck's Sensation Seeking Scale (SSS) Form V [37], an inventory for assessing sensation-seeking traits on four sublevels: Thrill and Adventure Seeking (TAS); Experience Seeking (ES); Disinhibition (Dis); and Boredom Susceptibility (BS). Form V of the SSS represents an improvement on several earlier sensation-seeking scales, with internal reliabilities of .77, .61, .14, .57, .84 for TAS, ES, Dis, BS and Total Sensation Seeking scores, respectively [37]. The Sensation Seeking Scale Form IV has demonstrated convergent validity with several other personality scales [28] and has also demonstrated predictive ability with many criterion measures, including involvement in risky sports, illegal drug use and promiscuous sexual behaviors.

Eysenck Personality Questionnaire (EPQ-R)

Major dimensions of personality were measured through Eysenck and Eysenck's [7] Personality Scale Revised (EPQ-R-Short Scale). The EPQ-R-S is an improved version of the EPQ, and measures the three broad dimensions of Eysenck's personality theory: Psychoticism or Tough-Mindedness; Neuroticism or Emotionality; and Extraversion. The EPQ-R-S also includes a lie scale measuring conformity. The EPQ-R-S demonstrates internal reliabilities of .62, .88, .84, and .77 for psychoticism, extraversion, neuroticism and lie scales respectively [4]. The extraversion and neuroticism scales in particular have demonstrated high convergence with corresponding personality trait measures [38] and the EPQ has demonstrated a general predictive ability for a variety of criterion measures, including depression, criminal involvement and schizophrenia [7].

Impulsivity, Venturesomeness and Empathy (IVE)

This questionnaire comprises 54 items measuring impulsivity, venturesomeness (sensation seeking), and empathy. The higher the score, the more likely it is that the person has these personality traits. Only the impulsivity and venturesomeness scales were analyzed in the current study and these have been found to have satisfactory alpha coefficients (0.84 and 0.85, respectively) [8]. For males, the correlation between impulsivity and venturesomeness is very low: 0.24 and 0.21 [8]. This is because the impulsivity and venturesomeness scales measure different aspects of impulsivity, with the former being more associated with dysfunctional aspects of personality, such as psychoticism, whereas venturesomeness is more related to extraversion.

Combat Exposure Scale (CES)

The Combat Exposure Scale (CES) is a seven-item self-report measure that assesses wartime stressors experienced by combatants. Items are rated on a five-point frequency (1 = "no" or "never" to 5 = "26+ times" or "51+ times"), five-point duration (1 = "never" to 5 = "7+ months"), or 45-point degree of loss (1 = "none" to 45 = "76% or more") scale.

Respondents are asked to reply based on their exposure to various combat situations, such as firing rounds at the enemy and being on dangerous duty.

Demographics

Demographics was used to obtain information on subjective variables such as gender, age, education, military rank and the number of previous deployments.

PROCEDURE

The research project was part of the Military Medical Institute grant and required the consent of the military authorities, which was granted. The examination took place at the military unit in the 10th Armored Cavalry Brigade in Świętoszów.

The study was carried out in the form of a questionnaire. The participants were gathered in the lecture hall of the military unit, where they filled the battery of tests under the assistance of a psychologist.

The study was longitudinal. The first measurement took place in September 2013, which was about a month and a half before leaving for the battlefield in Afghanistan. The second measurement took place 3 months after returning from the battlefield. In the meantime, the participants spent about 7 months in a war zone in Afghanistan.

DATA ANALYSIS

The initial part of the statistical analyses carried out included calculations of the value of descriptive statistics. A frequency distribution specifying the number of individual categories was presented for all categorical variables. The mean values, standard deviations, minimum and maximum results were calculated for interval variables. Then, the assumption about the normal distribution of analyzed variables was verified. For this purpose, the Kolmogorov–Smirnov test was used. Since statistically significant deviations from the normal distribution were found for most of the analyzed variables, subsequent analyses were performed using statistical methods that do not require normal distribution. The bootstrapping method was used, which created a probability distribution separately for each of the analyzed variables based on the results of multiple draws with returns. A total of 1,000 subsequent draws were carried out in the analyses. Other calculations used nonparametric statistical methods, which also did not require a normal distribution.

The hypothesis regarding the curvilinear relationship between sensation seeking and the level of posttraumatic stress was verified by estimating the quadratic function curve based on the least squares method.

Further hypotheses regarding the modifying effect of impulsiveness and traumatic stimulus strength on the relationship between sensation seeking and posttraumatic stress were analyzed using moderation analysis. The latter, unlike mediation analysis, is used to analyze the interaction between an explanatory variable and a variable that is relevant to the relationship between an explanatory variable and an explained variable, i.e. moderator. The verified interaction is that the strength and / or sign of the relationship between the explained and explanatory variables depends on the level of the moderator. The presented analyses verify whether the level of impulsiveness and the strength of the traumatic stimulus changes the strength and / or sign of the relationship between the sensation seeking and posttraumatic stress. The feature that defines a moderator is not entering statistically significant relationships with explanatory variables, but entering statistically significant interactions with these variables. The verified hypotheses speak about the moderating impact of impulsiveness, personality traits and the strength of the traumatic stimulus, so the main part of the statistical analysis is based on moderation analysis.

RESULTS

No statistically significant fit of the square curve to the data was obtained in any of the analyzed models, therefore it should be stated that no results confirming the hypothesis were obtained (Tab. 1).

One statistically significant interaction was obtained between the sensation seeking and impulsiveness in relation to the overall level of posttraumatic stress measured using the PTSD-C questionnaire. It was found that people characterized by a low level of general sensation seeking were characterized by a higher intensity of PTSD symptoms, provided that they also had higher results on the impulsiveness scale (Tab. 2). Based on the Johnson–Neyman procedure, it was found that the relationship between sensation seeking and severity of PTSD symptoms, in which sensation seeking is an explanatory variable was explained in 43.12% of subjects with the highest level of impulsiveness. However, no statistically significant relationship was found between the sensation seeking and the severity of PTSD symptoms in the group of people with average or low impulsiveness.

Three statistically significant interaction effects were obtained. Each of them concerned the severity of neuroticism. A positive relationship between the sensation seeking and the severity of PTSD symptoms measured using the PTSD-C questionnaire was obtained in a group of 14.29% of people with the highest intensity of neuroticism (Tab. 3).

Statistically significant positive correlations were obtained between the severity of neuroticism and the severity of PTSD according to the results in the PTSD-C and IES-R questionnaires and the severity of intrusion (Tab. 4).

Tab. 1. The results of the analysis of the relationship between sensation seeking and the severity of PTSD symptoms.

Severity of PTSD symptoms	Sensation seeking	PTSD-K			IES-R			Intrusions			Avoiding			Hyperarousal		
		R2	*F*	*df*	*p*	*R2*	*F*	*df*	*p*	*R2*	*F*	*df*	*p*	*R2*	*F*	*df*	*p*
	Altogether	0.01	0.08	2.120	0.920	0.01	0.21	2.120	0.812	0.01	0.18	2.120	0.840	0.01	0.17	2.120	0.845	0.01	0.03	2.120	0.974
	TAS	0.01	0.06	2.120	0.946	0.01	0.04	2.120	0.960	0.01	0.03	2.120	0.975	0.01	0.26	2.120	0.775	0.02	0.02	2.120	0.983
	ES	0.01	0.04	2.120	0.960	0.01	0.42	2.120	0.657	0.01	0.26	2.120	0.772	0.01	0.83	2.120	0.439	0.01	0.67	2.120	0.515
	DIS	0.01	0.11	2.120	0.896	0.01	0.13	2.120	0.874	0.01	0.32	2.120	0.725	0.01	0.01	2.120	0.988	0.01	0.23	2.120	0.796
	BS	0.02	1.20	2.120	0.305	0.01	0.72	2.120	0.491	0.01	0.87	2.120	0.421	0.01	0.47	2.120	0.625	0.01	0.62	2.120	0.541

R 2 – percentage of explained variance, F – model statistical significance test statistics; df – degree of freedom; p – statistical significance.

Tab. 2. Results of moderation analysis, in which impulsiveness was analyzed as a moderator of the relationship between sensation seeking and the severity of PTSD symptoms.

Explanatory variable	Moderator	Explained variable	*B*	*t*	*p*
Low sensation seeking	**Impulsiveness**	**PTSD-K**	**2.68**	**2.12**	**0.036**
High sensation seeking	Impulsiveness	PTSD-K	-0.58	-0.58	0.559
Low sensation seeking	Venturesomeness	PTSD-K	-0.39	-0.37	0.705
High sensation seeking	Venturesomeness	PTSD-K	1.26	1.08	0.282

B – non-standardized regression coefficients; t – value of the predictor statistical significance test; p – statistical significance.

Tab. 3. Personality traits as moderators of the relationship between the sensation seeking and the severity of PTSD symptoms.

Moderator	Explained variable	*B*	*t*	*p*
Extravert	**PTSD Symptoms**	-0.10	-0.89	0.371
Neuroticism	**PTSD-C**	**0.36**	**3.09**	**0.003**
Psychoticism		-0.26	1.66	0.098
Extravert	**PTSD Symptoms**	-0.02	1.62	0.107
Neuroticism	**IES-R**	**0.02**	**2.02**	**0.046**
Psychoticism		-0.02	1.78	0.077
Extravert	**Intrusions**	0.01	1.68	0.095
Neuroticism		**0.01**	**2.14**	**0.034**
Psychoticism		0.01	1.74	0.084
Extravert	**Avoiding**	0.01	1.11	0.268
Neuroticism		0.01	1.86	0.065
Psychoticism		0.01	1.40	0.163
Extravert	**Hyperarousal**	0.01	1.34	0.183
Neuroticism		0.01	1.92	0.057
Psychoticism		-0.01	1.83	0.070

B – non-standardized regression coefficients; t – value of the predictor statistical significance test; p - statistical significance.

Tab. 4. Correlation coefficients between the severity of personality traits and symptoms of PTSD.

PTSD Symptoms	Personality Traits			
	Extraversion	Neuroticism	Psychoti-cism	Control Scale - Lie
Severity of PTSD PTSD-C	**-0.094**	0.203*	-0.160	-0.109
Severity of PTSD **IES-R**	**-0.108**	**0.204***	**0.000**	**-0.104**
Intrusions	**-0.104**	0.249**	0.034	-0.126
Avoiding	**-0.117**	0.063	-0.029	-0.010
Hyperarousal	**-0.094**	**0.164**	**-0.047**	**-0.100**

** p<0.05; ** p<0.01.*

DISCUSSION

The results indicated a lack of a direct relationship between sensation seeking and posttraumatic stress among soldiers participating in the mission in Afghanistan.

As a result of the applied moderation analysis, it was found that low sensation seekers were characterized by a higher intensity of posttraumatic stress symptoms, provided that they simultaneously revealed a high level of impulsiveness.

Considering the individual personality traits, the role of neuroticism turned out to be a key factor. A positive relationship between the sensation seeking and symptoms of posttraumatic stress was found in about 14% of respondents with the highest level of neuroticism. However, in a more detailed view, high neuroticism favored the relationship between sensation seeking and intrusions.

The study also showed that the severity of the traumatic stimulus surprisingly did not play a significant role in moderating the relationship between sensation seeking and posttraumatic stress.

Additional analysis revealed two interesting relationships. Firstly, the level of posttraumatic stress correlated with the level of neuroticism. Secondly, after returning from the mission, the subjects obtained significantly higher scores on the lie scale.

Previous efforts had placed the sensation seeking either in the area of risk factors or in the field of protective factors. The results of the study left this answer open. First of all, the results did not confirm the hypothesis about the relationship between the sensation seeking and the level of posttraumatic stress. This meant that the sensation seeking was not a factor that directly affected their ability to adapt to war conditions. Their psychological response to the combat stressor turned out to be completely independent of the level of sensation seeking and all its components. The result turned out to be in line with Zuckerman's theoretical assumption [41] according to which the feature of sensation seeking – regardless of its severity – had no psychopathological significance. It was also worth noting that very similar results were obtained in recent studies that concerned Danish soldiers deployed in Afghanistan [19].

On the basis of Polish research, the results brought to mind the hypothesis of Dudek and Wojtecka [5], who believed that sensation seeking played a dual role during exposure to trauma while being both protective and risk factor. Therefore, the possibility of influencing the development of symptoms of posttraumatic stress by seeking sensations exists, provided that there are interactions with other factors. The type of interaction that determined the direction of moderation was also significant.

Analysis of impulsiveness as a moderator showed that in the area of interaction between sensation seeking and impulsiveness, it was possible that the sensation seeking – under certain conditions – acted as a risk factor. Although statistical interactions were too rare to speak of unambiguous confirmation of the hypothesis, the result turned out to be consistent with the adopted assumption. This result confirmed Joseph's intuition [14] regarding the significance of the distinction between impulsiveness and venturesomness when examining relationships for sensations and symptoms of posttraumatic stress. According to the theory of Eysenck and Eysenck [9], these two components differed in terms of awareness of undertaken actions as well as their risk and consequences. The results showed that among the soldiers with the greatest tendency to take no action, low sensation seeking was associated with a greater severity of symptoms of posttraumatic stress. However, this result was only partly in line with expectations, because theoretical assumptions showed that this relationship would also apply to high sensation seekers. Still, it shed new light on the importance of various psychological mechanisms in the process of developing PTSD symptoms. While there was no doubt that impulsiveness in the functioning of an individual performs a regulatory function [9], the methods of regulation might be different. The study assumed that the moderate role of impulsiveness would be associated to a greater extent with a tendency to thoughtless, premature, excessively risky and inadequate reactions to situations that, combined with high activity and a high sensation seeking, would be associated with a greater risk of exposure to trauma. Meanwhile, the situation in which the intensity of impulsiveness affects people with low sensation seeking suggests that the development of posttraumatic stress was less related to the consequences of a certain type of behavior, but rather was associated with internal abilities to regulate emotional tension, and, strictly speaking, with difficulties in tolerance of aversive stimuli. It was the tendency to immediately reduce emotional tension that seemed to be a factor indirectly hindering the integration of traumatic experiences into the structures of autobiographical memory and thus the integration of this experience. This, of course, did not mean that low sensation seekers were generally more at risk of traumatization.

Rather, the high level of impulsiveness could do more "harm" among people with low stimulation processing capabilities, because, as the results suggest, the development of posttraumatic stress was more associated with the importance of emotional reactivity than activity.

This interpretation seemed to correspond to the results of current research, in which the relationship between impulsiveness and PTSD was explained by the mechanism of negative urgency, i.e., a tendency to violent behavior while experiencing intense stress to reduce emotional tension [20]. This mechanism referred to internal predispositions and is associated with difficulties in regulating emotions [33]. It was also worth mentioning that the association between PTSD symptoms and dysphoric symptoms was found by Taft et al. [27], who suggested the relevance of aggression theory to the study of combat veterans.

In turn, the analysis of the impact of personality traits showed that a high level of neuroticism determined the relationship between the sensation seeking and the symptoms of posttraumatic stress. Neuroticism is, in fact, a trait that is commonly associated with susceptibility to PTSD symptoms [15]. According to the researchers' opinion, it is even considered the most important personality dimension when it comes to the possibility of predicting post-traumatic stress disorder. Numerous studies (see for example Bromet et al. [3]) indicated that a history of anxiety disorders constitutes a significant risk factor of revealing PTSD. It is also worth adding that a correlation between the level of neuroticism and the severity of posttraumatic stress was also obtained in this study.

The importance of intensifying neuroticism in the context of the relationship between sensation seeking and posttraumatic stress is complex and its cause is likely to lie in multiple phenomena. One possible explanation seems to be a situation in which an increased level of anxiety, by influencing the interaction between emotional activity and reactivity, would be a factor facilitating the tendency to overstimulation (expressed by an increase in the level of activation). It is known that neurotic people are prone to excessively strong psychophysiological responses to stress. This would mean that high levels of anxiety disrupt the stimulation regulation mechanism. However, it is difficult to precisely define the mechanisms of this phenomenon, if only because the activation construct does not allow a distinction to be made between anxiety and mental excitement [24].

In turn, research on individual differences indicated that people with high extraversion and high neuroticism were particularly susceptible to risky behavior [32]. Also Zuckerman [39] put forward the hypothesis that neurotic entities – on the basis of anti-phobia – tend to undertake risky behaviors. This seems to be another clue by which one can attempt to explain the effect of high levels of neuroticism on the positive relationship between sensation seeking and PTSD symptoms. It would mean that highly neurotic people undertaking risky behavior in situations of intense stimulation would be guided by a need to reduce tension rather than a rational assessment of the situation. The mechanism of action of highly neurotic persons would therefore be similar to those characterized by high impulsiveness. A certain argument for adopting this interpretation would also be the result concerning the relationship between the sensation seeking and the symptoms of intrusion moderated by a high level of neuroticism. As is known from the theory of double representation [2], the symptoms of intrusion had their origins in memories that were not included in the verbal memory system, because during the traumatic event they required too much attention. However, it seems that the mode of action of highly neurotic people during stress exposure is to focus on reducing internal tension at the expense of attention to external stimuli.

In addition, the importance of traumatic stimulus strength was also analyzed for relationships with personality variables. The result showed that the relationship between the strength of the traumatic stimulus and the symptoms of posttraumatic stress applies to the same extent regardless of the severity of personality variables, which meant that there was no structure of personality traits that would protect against PTSD after a traumatic event.

However, the explanation for the unexpected decrease in the severity of distraction observed during the second measurement seems to be hidden under the lie scale results, which turned out to be significantly higher after returning from the mission. The situation of the group of respondents was such that during the first measurement they had already completed the process of qualifying for the mission, and therefore the participation in psychological research was not in any way threatening for them. The situation was different during the second measurement, where the issue of further military service was involved. This perspective could undoubtedly play a role in reinforcing the tendency to present oneself in a favorable light.

In any case, the higher lie score obtained during the second measurement is very puzzling. It obviously suggests that posttraumatic stress symptoms may be dissimulated and confirms the stereotype of soldiers as a group reluctant to reveal their emotional problems. This is in some way convergent with recent studies that found that veterans receiving mental health care perceived it as a kind if stigma [12].

CONCLUSIONS

1. The results confirmed that there is no system of personality factors that would absolutely protect against the symptoms of posttraumatic stress. Regardless of individual personality and temperament equipment, any individual exposed to a traumatic event may experience post-traumatic stress symptoms.
2. The study provided information on the feature of sensation seeking, which, regardless of its severity, did not have a psychopathological dimension, and therefore should not be treated as a predictor of emotional disturbances.
3. The results of the conducted research allow it to be stated that among the soldiers fighting in Afghanistan, individual differences in the area of sensation seeking did not have a direct impact on the level of severity of posttraumatic stress. However, under certain conditions created by personality variables, a relationship between sensation seeking and posttraumatic stress can occur.
4. Among the personality factors moderating this relationship, neuroticism and impulsiveness should be distinguished, because of their association with the risk of mechanisms triggering the development of posttraumatic stress.
5. A possible explanatory mechanism included increased readiness to undertake risky behaviors in the event of exposure to intense and long-term stressors due to intolerance to aversive stimuli leading to the urge to immediately reduce emotional tension.
6. Among the personality types, individuals with high anxiety and high impulsiveness would be most susceptible to the consequences of traumatic stress. This configuration was also the opposite of the structure that made up the construct of emotional stability [26].
7. The research results confirmed that the balance point of the diagnosis of susceptibility to posttraumatic stress is placed closer to the sphere of emotion than formal behavioral characteristics.

AUTHORS' DECLARATION:

Study Design: Maciej Zbyszewski, Jan F. Terelak. **Data Collection:** Maciej Zbyszewski, Jan F. Terelak. **Manuscript Preparation:** Maciej Zbyszewski, Jan F. Terelak. The Authors declare that there is no conflict of interest.

REFERENCES

1. Boden M, Westerman S, Macrae K. Emotion regulation and post-traumatic stress disorder: A prospective investigation. Journal of Social and Clinical Psychology. 2013; 32(3): 296-314.
2. Brewin C, Dalgleish T, Joseph S. A dual representation theory of post-traumatic stress disorder. Psychological Review. 1996; 103: 670-686.
3. Bromet E, Sonnega A, Kessler RC. Risk factors for DSM-III-R post-traumatic stress disorder: Findings from the National Comorbidity Survey. American Journal of Epidemiology. 1998; 147(4).
4. Brzozowski P, Drwal RŁ. Kwestionariusz Osobowości Eysencka. Polska adaptacja EPQ-R. Podręcznik. Pracownia Testów Psychologicznych PTP, Warszawa 1995.
5. Dudek B, Wojtecka K. Potrzeba stymulacji a ekspozycja na zdarzenia traumatyczne. Acta Universitatis Lodziensis: Folia Psychologica. 2009; 13: 41-54.
6. Ehlers A, Clark D. A cognitive model of post-traumatic stress disorder. Behaviour Research and Therapy. 2000; 38: 319-345.
7. Eysenck HJ, Eysenck MW. Personality and individual differences: A natural science approach. Plenum 1985.
8. Eysenck HJ, Eysenck SBG. Manual of the Eysenck Personality Scale (Adults). London, UK: Hodder and Stoughton 1991.

9. Eysenck SBG, Eysenck HJ. The place of impulsiveness in a dimensional system of personality description. British Journal of Social & Clinical Psychology. 1977; 16: 57-68.
10. Fear NT, Iversen AC, Chatterjee A, Jones M, Greenberg N, Hull L, Rona RJ, Hotopf M, Wessely S. Risky driving among regular armed forces personnel from the United Kingdom. American Journal of Preventive Medicine. 2008; 35: 230-236.
11. Glicksohn J, Ben-Shalom U, Lazar M. Elements of unacceptable risk taking in combat units: An exercise in offender profiling. Journal of Research in Personality. 2004; 38: 203-215.
12. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. The New England Journal of Medicine. 2004; 351(1): 13-22.
13. Horowitz MJ. Stress response syndromes: A review of post-traumatic and adjustment disorders. Hospital and Community Psychiatry. 1986; 37(3): 241-249.
14. Joseph S, Dalgleish T, Thrasher S, Yule W. Impulsivity and post-traumatic stress. Personality and Individual Differences. 1997; 22: 279-281.
15. Lawrence J, Fauerbach J. Personality, coping, chronic stress, social support and PTSD symptoms among adult burn survivors: a path analysis. Journal of Burn Care Rehabilitation. 2003; 24: 63-72.
16. NeriaY, Solomon Z, Ginzburg K, Deke R. Sensation seeking, wartime performance, and long-term adjustment among Israeli war veterans. Personality and Individual Differences. 2000; 29: 921-932.
17. Oniszczenko W. Temperamental correlates of trauma symptoms in firemen, policemen and soldiers. International Journal of Occupational Medicine and Environmental Health. 2014; 27(4): 599-607.
18. Otis C, Marchand A, Courtois F. Peritraumatic dissociation as a mediator of peritraumatic distress and PTSD: A retrospective, cross-sectional study. Journal of Trauma and Dissociation. 2012; 13: 469-477.
19. Ponce de León B, Andersen S, Karstoft KI, Murphy S, Elklit A. Sensation seeking as a predictor of psychopathology in Danish soldiers deployed to Afghanistan. Military Psychology. 2018; 30(5): 381-389.
20. Roley M, Contractor A, Weiss N, Armour C, Elhai J. Impulsivity facets' predictive relations with DSM V PTSD symptom clusters. Psychological Trauma: Theory, Research, Practice, and Policy. 2017; 9(1): 76-79.
21. Solomon Z, Ginzburg K, Neria Y, Ohry A. Coping with war captivity: The role of sensation seeking. European Journal of Personality. 1995; 9: 57-70.
22. Strelau J, Zawadzki B. Trauma and temperament as predictors of post-traumatic stress disorder and its dimensions 3, 15 months and 2 years after experiencing flood. Polish Psychological Bulletin. 2004; 35: 5-1.
23. Strelau J, Zawadzki B. Trauma and temperament as predictors of post-traumatic stress disorder after disaster. European Psychologist. 2005; 10: 124-135.
24. Strelau J. Miejsce konstruktu aktywacji w badaniach nad temperamentem. Przegląd Psychologiczny. 2001; 3: 275-300.
25. Strelau J. Temperament and stress: Temperament as moderator of stressors, emotional states, coping, and costs. In: C.D. Spielberger, & I. G. Sarason (Eds.), Stress and emotion: Anxiety, anger, and curiosity. Hemisphere. 1995; 15: 215-254.
26. Strus W. Dojrzałość emocjonalna a funkcjonowanie moralne. Wydawnictwo Liberi Libri, 2012.
27. Taft CT, Vogt DS, Marshall AD, Panuzio J, Niles BL. Aggression among combat veterans: Relationships with combat exposure and symptoms of post-traumatic stress disorder, dysphoria, and anxiety. Journal of Traumatic Stress. 2007; 20(2): 135-145.
28. Trimpop RM. The psychology of risk-taking behaviour. Elsevier Science, 1994.
29. van der Kolk AB. The compulsion to repeat the trauma. Psychiatric. Clinics of North America. 1989; 2(12), 389-411.
30. van Emmerik IH, Euwema MC. The international assignments of peacekeepers: What drives them to seek future expatriation? Human Resource Management. 2009; 48: 135-151.
31. Volkert J, Randjbar S, Moritz S, Jelinek L. Risk recognition and sensation seeking in revictimization and post-traumatic stress disorder. Behaviour Modification. 2013; 37: 39-61.
32. Vollrath M, Torgersen S. Who takes health risks? A probe into eight personality types. Personality and Individual Differences. 2002; 32(7): 1185-1197.
33. Weiss N, Tull M, Anestis M, Gratz K. The relative and the unique contributions of emotion dysregulation and impulsivity to post-traumatic stress disorder among substance-dependent inpatients. Drug Alcohol Dependence. 2013; 128: 45-51.
34. Yehuda R, McFarlane AC. Conflict between current knowledge about PTSD and its original conceptual basis. American Journal of Psychiatry. 1995; 152: 1705-1713.
35. Zawadzki B, Popiel A. Temperamental traits and severity of PTSD symptoms. Data from longitudinal studies of motor vehicle accident survivors. Journal of Individual Differences. 2012; 33: 257-267.

36. Zawadzki B, Strelau J, Bieniek A, Sobolewski A, Oniszczenko W. Kwestionariusz PTSD – wersja kliniczna (PTSD-K): konstrukcja narzędzia do diagnozy zespołu stresu pourazowego. Przegląd Psychologiczny. 2002; 3: 289-315.

37. Zuckerman M, Eysenck SBG, Eysenck HJ. Sensation Seeking in England and America: Cross-Cultural, age and sex comparisons. Journal of Consulting and Clinical Psychology. 1978; 46: 139-149.

38. Zuckerman M, Kuhlman M, Joireman J, Teta P, Kraft M. A comparison of three structural models for personality: The Big Three, the Big Five and the Alternative Five. Journal of Personality and Social Psychology. 1993; 65: 757-768.

39. Zuckerman M. Behavioral expressions and biosocial bases of sensation seeking. Cambridge University Press, 1994.

40. Zuckerman M. Sensation seeking and impulsivity: A marriage of traits made in biology? In W. G. McCown, (J.L. Johnson, & M. B. Shure (Eds), The impulsive client: Theory, research, and treatment. American Psychological Association. 1993; 71-91.

41. Zuckerman M. Sensation seeking: Beyond the optimal level of arousal. Lawrence Erlbaum Associates, 1979.

Cite this article as: Zbyszewski M, Terelak J. Sensation Seeking And Posttraumatic Stress Levels In Polish Soldiers Fighting In Afghanistan. Pol J Aviat Med Bioeng Psychol 2021; 27(1): 20-31. DOI: 10.13174/pjambp.28.02.2024.03