original article

Interrelation between intolerance of uncertainty and the time perspective profile in the military

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BACKGROUND

Time perspective (TP) theory suggests that people tend to categorize their experience in terms of the past, the present, and the future. Studies have shown that a balanced TP profile supports well-being while misbalance in the TP profile is associated with various psychopathology. On the other hand, an intolerance of uncertainty (IU) underpins a variety of affective disorders. There are still a lot of questions about the relationship between IU and the TP. The purpose of this study was to clarify the interrelation between the time perspective distortion and intolerance of uncertainty level and to examine the degree to which IU and TP scales are associated with posttraumatic stress symptoms in a military sample.

PARTICIPANTS AND PROCEDURE

The sample of servicemen (N = 129) completed ZTPI, the IUS-12 and PCL-5 questionnaires. Correlational and regression analyses were conducted with IU scores, TP scales and DBTP and DBTP-r coefficients.

RESULTS

IU total score correlates with Past Negative (PN), Present Hedonistic (PH), Present Fatalistic (PF), and Future (F) time perspectives in the military sample. Groups that differ in the level of IU have a significant difference in Past Negative TP. Regression analysis models using DBTP as well as DBTP-r coefficients showed similar results. Inhibitory IU, not Prospective IU, turned out to be a predictor of post-traumatic stress symptoms in this military, non-clinical sample.

CONCLUSIONS

Further studies should determine directions of associations between intolerance of uncertainty and time perspective.

KEY WORDS

time perspective; servicemen; DBTP revised; intolerance of uncertainty; deviation from balanced time perspective

BACKGROUND

In recent years, the situation in Ukraine has been unstable due to the military conflict in the eastern part of the country. According to official sources, more than 10 thousand servicemen were injured in the hostilities (Radio Svoboda, 2021). It is known that post-traumatic stress disorder (PTSD) symptoms are detected in both civilians (3.5-13%) and veterans who have combat experience (10-30%) (Gradus, 2005). According to clinical disorder prevalence statistics by Veterans Health Administration (USA), depression and PTSD rank, respectively, first and second in frequency of manifestations in the military (Trivedi et al., 2015). As there are no official statistics available in Ukraine, we will focus on international data, assuming that the distribution of diseases is similar.

A person's attitude to time – stuck in the past, life in the present or dreams of the future – can affect the process of adaptation after trauma and is associated with both a sense of well-being and a number of symptoms of psychological disorders. Time perspective (TP) describes a variety of cognitions and behaviors inherent in people who perceive and experience time limits differently. Zimbardo and Boyd (2009) identified five temporal dimensions that can be used to describe an individual's time perspective: the Past Negative (PN), the Past Positive (PP), the Present Hedonistic (PH), the Present Fatalistic (PF), and the Future (F).

A distorted time perspective may complicate the process of adapting to both new circumstances and previous traumas: research shows that people with PTSD tend to be stuck in the negative past, feel doomed in the present, and not believe in the future (Holman & Silver, 1998; Zimbardo et al., 2012). Another factor that diminishes the ability to adaptively deal with life traumas and changes is intolerance of uncertainty. Fear of the unknown (Carleton et al., 2007) and the resulting intolerance of uncertainty leads to many psychopathologies and is associated with depression (Carleton, 2016; McEvoy et al., 2019), anxiety (Ouellet et al., 2019) and PTSD symptoms (Boelen, 2019; Raines et al., 2019).

This study aims to investigate associations between time perspective and intolerance of uncertainty in a military sample.

TIME PERSPECTIVE AND POST-TRAUMATIC STRESS

Traumatic events, by definition, are those that exceed the ability of the psyche to process them; attention is narrowed to the present moment and to what is happening here and now. The ability of temporal integration is reduced. Such disintegration of perception interrupts the natural differentiation process of experience in terms of the past, the present and the future (Holman & Silver, 1998). Although an objectively traumatic event becomes a part of the past after a while, subjectively it continues to live as the eternal present (van der Kolk, 2015; van der Kolk & van der Hart, 1991; Holman & Silver, 1998) and prevents leaving the past.

People with PTSD have a time perspective profile with high scores on the Past Negative (PN) scale and low scores on the Past Positive (PP) and the Future (F) scales. The Present Fatalistic and the Past Negative correlate with the severity of traumatic events, anxiety, depression and PTSD symptoms (Papastamatelou et al., 2020; Walg et al., 2020; Zimbardo et al., 2012). Holman and Silver (1998) found that people with a time-oriented focus on the past had a higher level of distress than people with a focus on the present or the future one year after stressful events. Similar results were obtained by Papastamatelou et al. (2020). Comparison between a clinical group and a control healthy group revealed a difference in the Past Negative, the Past Positive and the Present Fatalistic time scales. It has been suggested that a focus on the Past Positive and the Future may be a kind of "protection" against the development of psychopathology (van Beek et al., 2011). The importance of developing Future time perspective was emphasized in Kooij et al. (2017) meta-analysis.

On the other hand, the ability to consider situations from various time perspectives is the basis for a balanced time perspective profile. For example, Mucha's et al. (2020, p. 83) research shows that "metacognitive management of time" is important for efficient self-regulation of behavior, which is relevant for people with posttraumatic stress symptoms.

BALANCED TIME PERSPECTIVES (BTP)

There are optimal characteristics of the time perspective profile. It assumes a high score on the Past Positive scale, medium scores on the Present Hedonistic and Future, and low scores on the Past Negative and Present Fatalistic scales (Zimbardo & Boyd, 2009). This optimal configuration is related to psychological and physical health (Stolarski et al., 2020) and correlates with the structure and the characteristics of the way one builds the network of healthy, supportive social contacts.

The basic formula of the deviation from the balanced time perspective (DBTP) coefficient was proposed by Stolarski et al. (2011). It is calculated as the difference between optimal (o) and empirical (e) levels of time perspectives:

$$DBTP = \sqrt{\begin{array}{c}(oPN - ePN)^2 + (oPP - ePP)^2 + (oPF - ePF)^2 + \\ + (oPH - ePH)^2 + (oF - eF)^2\end{array}}$$

The values indicating optimal levels of time perspectives corresponded to percentile distribution of scores and based on Zimbardo and Boyd's database (cf. www.thetimeparadox.com/surveys). The optimal score values for each domain were defined as follows: PN = 1.95, PP = 4.60, PH = 0.90, PF = 1.50, and F = 4.00 (Stolarski et al., 2011). Stolarski and Cyniak-Cieciura (2016) have shown the importance of a balanced time perspective (BTP) as a mediator of personal factors on PTSD. It was found that the BTP could also function as a preventive factor against anxiety and depression (Oyanadel & Buela-Casal, 2014). The classic formula "assumes quadratic associations between particular TP dimensions and external criteria of balance" (Stolarski et al., 2020, p. 17). At the same time, further studies did not confirm the quadratic correlations between DBTP and many indicators of wellbeing. In particular, a linear correlation was found between the deviation from balanced TP and such indicators as life satisfaction (Jankowski et al., 2020). The imperfection of the methodology for calculating the optimal score for each scale (the values change when data are added) led to a discussion about which scores on each scale should be taken as optimal. Jankowski et al. (2020) proposed a revised deviation factor from the balanced profile. DBTP-r suggested that optimal values should be either 1 (PN, PF) or 5 (PP, F), as these are the extreme scores from the Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999) and 3.4 for PH as it showed ambiguous results (Jankowski et al., 2020). According to Jankowski et al. (2020) DBTP-r has a greater predictive value, since it reflects the linear relationship between the TP and different indicators of well-being.

Although there is an ongoing discussion about the feasibility of using the integrated BTP coefficient and its variations (McKay & Cole, 2020), a new conceptualization of this concept and the method of calculation (Stolarski & Witowska, 2017), there is a significant amount of research confirming the relationship of the BTP with both indicators of psychopathology and mental health.

Since DBTP-r has not yet become widespread in research, to analyze the relationship of intolerance of uncertainty with the TP profile, we will take two coefficients (DBTP and DBTP-r) and compare the calculation results.

INTOLERANCE OF UNCERTAINTY

Intolerance of uncertainty describes "the incapacity to endure the aversive (i.e., fearful) response triggered by the perception of one or more salient or key unknowns and sustained by the associated perception of uncertainty" (Carleton, 2016, p. 32). The intolerance of uncertainty concept was originally formulated as part of the generalized anxiety disorder (GAD) study

to explain pathological anxiety (Dugas et al., 1998; Freeston et al., 1994). Further conceptualization led to the understanding of intolerance of uncertainty as a transdiagnostic factor underlying many affective disorders (Carleton et al., 2007; McEvoy et al., 2019).

The original Intolerance of Uncertainty Scale (IUS; Freeston et al., 1994) had one total score and a 5-factor structure. Subsequent refinement of the concept, verification and improvement of the questionnaire led to development of its shortened version, IUS-12, which showed a stable two-factor structure (Carleton et al., 2007; McEvoy & Mahoney, 2011) and withstood translation and adaptation into different languages (for example, Bavolar, 2019; Bottessi et al., 2019; Yao et al., 2020). In the currently most accepted understanding, intolerance of uncertainty is considered as a two-factor construct that reflects beliefs about uncertainty (Perspective IU) and an emotional stressful response to unexpected events (Inhibitory IU). Meta-analysis confirmed that intolerance of uncertainty has a "robust moderate transdiagnostic association" with a range of affective disorders (McEvoy et al., 2019, p. 9).

IU AND POST-TRAUMATIC STRESS

The strength of a negative affective response to stress depends on how a person perceives a traumatic event. Tolerance of distress is defined as an ability to withstand unpleasant physical and psychological conditions and consists of five dimensions: intolerance of uncertainty, intolerance of ambiguity, intolerance of frustration, intolerance of negative emotions and physical discomfort (Zvolesnky et al., 2010). In their study Bardeen et al. (2017) considered all of the dimensions and found that intolerance of uncertainty is the only significant predictor of the extent to which a person perceives an event as stressful. Beliefs about one's inability to act effectively in conditions of uncertainty are an important part of a negative attitude towards surprises and might determine the magnitude to which individuals perceive a stressful event as difficult, unpleasant and disturbing. A study by Paluszek et al. (2021) found a direct correlation between intolerance of uncertainty and COVID-19-related distress, which confirms a natural inverse relationship of intolerance of uncertainty with resilience (Cooke et al., 2013). Satici et al. (2020) found that in a pandemic, intolerance of uncertainty is related to fear of COVID-19 and has a significant direct negative effect on mental well-being.

In the development of post-traumatic stress symptoms, the role of the Inhibitory IU scale turned out to be a more significant predictor than Perspective IU in a sample of students (Boelen, 2019) and among civil respondents with a heterogeneous trauma history (Bardeen et al., 2017; Fetzner et al., 2013).

The results indicated that IU was significantly related to the avoidance, hyperarousal, and emotional numbing PTSD clusters and was not significantly associated with re-experiencing (Fetzner et al., 2013; Oglesby et al., 2017). In a sample of military personnel who turned to a clinic for help, Raines et al. (2019) obtained different results: Prospective IU was significantly associated with overall PTSD symptom severity, whereas Inhibitory IU was not. In a meta-analytical study Gentes and Ruscio (2011) found differences in the strength of the relationship between intolerance of uncertainty and anxiety in student samples in comparison to treatment-seeking samples. Thus, the contribution of each IU dimension to post-traumatic stress (PTS) symptoms requires further clarification.

IU AND FUTURE

Intolerance of uncertainty highlights the attitude towards the unknown, unlike intolerance of ambiguity, which describes the response to data based on which it is difficult to draw unambiguous conclusions or to make choices (Carleton, 2016; Grenier et al., 2005). A high level of IU envisages the feeling of uncertainty about the future and one's ability to cope with surprises. Although there is a suggestion of attitude towards time, the future in particular, in the definition of the term "intolerance of uncertainty", there are very few studies of the relationship between IU and time perspective.

Yang et al. (2021), using the theory of Trope and Lieberman (2010), tested an assumption that respondents who are able to project the future in the long term will have a lower intolerance of uncertainty level. The construal level theory states that the psychological distance between objects in the consciousness can be more or less close. Closer objects are described by people in more detail and with more emotions. Objects that are psychologically distant from us are seen in a generalized and detached manner. The attitude to the future from a more distant perspective allows people to treat possible upcoming events more calmly, without getting involved. Accordingly, having the ability to look at their life from afar, people are less emotionally involved in the experience of current events. A study by Yang et al. (2021) revealed an inverse relationship between the level of intolerance of uncertainty and attitude towards the future.

Another possible prerequisite for a negative relationship between intolerance of uncertainty and the future time perspective is the fact that IU is associated with anxiety (Dugas et al., 1998; Freeston et al., 1994), and anxiety is associated with low scores on the Future scale (Walg et al., 2020). Studies by Durak Batıgün and Şenkal Ertürk (2021) and Rönnlund et al. (2017) found that intolerance of uncertainty is associated with negative beliefs and expectations from the future and with an increase in negative symptoms of perceived stress in adults.

As intolerance of uncertainty increases vulnerability to stressors, and underlies many psychopathologies, and people with affective spectrum disorders differ from a balanced TP, it can be assumed that intolerance of uncertainty is associated with time perspective scales, at least with PN, PF and Future.

The aims of this study are as follows:

Test for interrelations between intolerance of uncertainty and time perspective scales.

To determine how differences between respondents are displayed using different coefficients of deviation from the balanced TP profile (DBTP and DBTP-r).

To examine the degree to which DBTP, DBTP-r, IU total score, IU and TP scales scores generally are associated with posttraumatic stress symptoms in a military sample.

PARTICIPANTS AND PROCEDURE

PARTICIPANTS

The sample consisted of servicemen (N = 129). The average age in the sample was M = 34.5 (from 19 to 59, SD = 8.3), men 105 (81.4%), women 24 (18.6%). The sample includes respondents who were in the Armed Forces of Ukraine in the period from 2014 to 2020.

PROCEDURE

The data were collected through an offline survey (n = 78) and an online form (n = 62). After the questionnaires had been checked, 11 of them were rejected because they were incomplete (6 of them were completed offline, and 5 were completed online). Paper questionnaires were offered for filling in one of the higher military educational institutions and distributed through a 'Come back alive' NGO working with military personnel and veterans. A link to the online form was circulated through another NGO ('Women's Veteran Movement') and sent to one of the training bases in the center of the country. Since the data were collected in different ways, Student's t-test was used to check the homogeneity of the two groups (responses collected offline and responses collected online) for key variables. There were no statistically significant differences in the intolerance of uncertainty level (IUS-12) and PTSD symptoms (PCL-5) between the subsamples.

The study was conducted on a voluntary basis; participants were informed about the objectives of the study and signed the consent form to personal data processing. The research procedure was approved at the ethics section of the research board in the Institute

of Social and Political Psychology (the research board follows the guidelines of APA 2017 Ethics Code).

MEASURES

Intolerance of Uncertainty Scale – short form (IUS-12). The short version (IUS-12) of the Intolerance of Uncertainty Scale was created by Carleton et al. (2007; Ukrainian version: Hromova, 2021) and has 12 items. It has a total score and two subscales: Perspective anxiety (Perspective IU) and Inhibitory anxiety (Inhibitory IU). Respondents were asked to answer the Likert scale questions to what extent they agree with each question, where 1 meant *completely disagree*, 5 meant *completely agree*. Maximum total score was 60. In the present study Cronbach's α for total score was .81; Prospective IU scale α = .70 and Inhibitory IU scale α = .73. For the general sample (N = 129) M = 31.09, Me = 31, SD = 7.74, min = 12, max = 59.

Zimbardo Time Perspective Inventory (ZTPI). ZTPI (Zimbardo & Boyd, 1999; Ukrainian version: Senyk, 2012) is a self-report questionnaire that consists of 56 questions grouped into five scales: the Past Negative (PN), the Past Positive (PP), the Present Hedonistic (PH), the Present Fatalistic (PF) and the Future (F). The respondents were asked to answer questions on a Likert scale from 1 (*not typical*) to 5 (*very typical*). In the present sample Cronbach's α of the ZTPI was .79, .48, .73, .79 and .62 for PN, PP, PH, PF and F respectively.

Deviations from the balanced time profile (DBTP) and revised deviation from the balanced time profile coefficients (DBTP-r) were determined for each respondent, and were calculated according to the proposed (Jankowski et al., 2020; Stolarski et al., 2011) formulas.

PTSD Checklist for DSM-5 (PCL-5). PCL-5 is a 20-item self-report evaluating PTSD symptom severity (Weathers et al., 2013; Ukrainian version: Karachevsky, 2016). Respondents answered questions on a Likert scale from 0 (*not at all*) to 4 (*extremely*), referencing the most traumatic life event they could remember. In the current study Cronbach's α for total score was .95. Since criterion A and an interview (which were not planned during data collection) are required to make a diagnosis of PTSD, the results from the PCL-5 questionnaire will be referred to as PTS symptoms.

ANALYSIS

Bivariate Pearson correlation analyses were conducted to assess the relationships between intolerance of uncertainty, time perspective scales, deviation from BTP coefficients and PTS symptoms. Although skew and kurtosis did not exceed ±2, the relationships between the variables were double checked using robust nonparametric control analyses (Spearman's coefficient for rank-order correlation and Mann-Whitney test for comparative analysis) due to the small size of subgroups. Post hoc power analyses were then conducted using G*Power 3.1.9.4. Then linear regression analyses were conducted with time perspectives, IU total score and subscales serving as predictors for symptoms of PTS for the total sample (N = 129). The analysis was performed using SPSS 23.0 software.

RESULTS

Correlations between intolerance of uncertainty and time perspective scales of the Zimbardo questionnaire are presented in Table 1.

The intolerance of uncertainty total score has a medium level of correlation with the Past Negative (r = .48, p < .001, 1-β = .99) and the Present Fatalistic (r = .32, p < .001, 1-β = .98) time perspectives. There is a weaker relationship with the Present Hedonistic (r = .19, p < .001, 1-β = .69) and the Future (r = .18, p < .001, 1-β = .66). Nonparametric control analysis confirmed results for these two TP: ρ = 0.20, p = .027 for the PH and ρ = 0.17, p = .049 for the Future. There is also a moderate positive correlation between the IU level and PTS symptoms (r = .46, p < .001, 1-β = .99).

Since the correlation analysis showed interrelations between intolerance of uncertainty and time perspective scales, we divided the sample into subgroups with a high and low IU level, taking respondents from the lower and upper tercile of the sample according to the total intolerance of uncertainty score: subgroup A (IUS < 24; n = 27, M = 21.00, SD = 2.10) and subgroup C (IUS > 37; n = 28, M = 42.00, SD = 4.40). Most of the sample with IU values within ±1 SD constituted the middle group B (24 < IUS < 37; n = 74, M = 30.60, SD = 3.65). Comparison of the subgroups with the lowest and highest IU scores showed a difference in the Past Negative (t(108) = −4.32, p < .001, d = 1.17, 1-β = .99). On the verge of significance Student's t-test showed differences for the PF (p = .064) and the F (p = .061). Nonparametric control analysis (Mann-Whitney test) confirmed differences for three scales: PN (U = 155.5, p < .001), PF (U = 250.5, p = .031) and F (U = 237, p = .017) There was no significant difference in DBTP and DBTP-r coefficients between subgroups A and C. The analysis results of the comparison of groups with extreme intolerance of uncertainty values turned out to be ambiguous, and further research is needed to clarify the differences in the time perspective scales in people with different intolerance of uncertainty levels in a larger sample.

The next step was to check the contribution of each variable to the development of post-traumatic stress symptoms. Models of linear regression analyses (Table 2) were significant and had no multicollinearity problem (all the VIF were not more than 1.3,

Table 1

Zero order correlations, means, and standard deviations (N = 129)

Variable	PA	IA	PN	PP	PH	PF	F	DBTP	DBTP-r	PCL-5	M	SD	Skewness	Kurtosis
IUS-12	.93**	.87**	.48**	.17	.19*	.32**	.18*	.11	.26**	.46**	31.09	7.74	.41	-.16
PA	1	.63**	.34**	.19*	.13	.21*	.26**	.05	.15	.34**	20.29	4.87	.25	-.47
IA		1	.50**	.10	.23**	.40**	.03	.18*	.36**	.52**	10.79	3.69	.62	.58
PN			1	.20*	.47**	.59**	.003	.39**	.64**	.60**	31.98	7.55	.41	-.22
PP				1	.32*	.24**	.21*	-.38**	-.15	-.02	30.11	4.27	-.38	.58
PH					1	.51**	.07	.42*	.35**	.44**	53.11	8.03	.44	.17
PF						1	-.13	.06	.73**	.41**	25.36	5.79	.31	.33
Future							1	-.19*	-.23**	.09	43.05	5.42	-.48	.66
DBTP								1	.45**	.45**	2.49	0.43	.33	-.36
DBTP-r									1	.49**	3.67	0.69	.04	.88
PCL-5										1	23.78	20.02	.67	-.61

Note. IUS-12 – Intolerance of Uncertainty Scale, total score; PA – Perspective IU; IA – Inhibitory IU; PN – Past Negative; PP – Past Positive; PH – Present Hedonistic; PF – Present Fatalistic; F – Future; DBTP – deviation from the balanced time profile coefficient; DBTP-r – deviation from the balanced time profile revised coefficient; PCL-5 – post-traumatic stress symptoms questionnaire, total score;
$^*p < .05$, $^{**}p < .01$.

and were far from the critical value of 10.0 suggested by Field, 2013). Analysis of residuals revealed no homoscedasticity problems.

As can be seen from Table 2, both coefficients of deviation from the balanced time perspective profile show a significant contribution to the post-traumatic symptoms' development. Also, in order to assess the impact of all TP and IU dimensions on PTS symptoms, a model was tested where all TP scales (PN, PP, PH, PF and F) and two intolerance of uncertainty scales separately were taken as independent variables (Perspective IU and Inhibitory IU). However, checking the residuals for homoscedasticity did not confirm the validity of the model. Model 5 reflects the significant contribution of intolerance of uncertainty (total score) and PN, PP (inverse relation) and PH scales in the development of PTS symptoms.

DISCUSSION

The first aim of the study was to investigate associations between IU and TP dimensions. As can be seen from Table 1, the IUS-12 Inhibitory IU subscale has a stronger relationship with the PN, PF and PH scales. Questions on the IA scale involve disbelief in one's own ability to cope with a strong negative emotional reaction to unexpected circumstances. Such a belief fixes the filter of attention on situations such as 'I did not cope', which can eventually condense into a negative view of the past. It also deprives individuals of hope and faith in their own ability to cope with unforeseen difficulties in the future. Thus, attention is focused on the inability to influence one's own life, the meaning of one's own efforts is devalued and a fatalistic view of the present is formed.

Table 2

Summary of regression analyses with intolerance of uncertainty, deviation from balanced TP coefficients and time perspectives scales predicting post-traumatic stress symptoms

Model	Variables	R^2	F	β	t	sr^2
1	Dependent variable – PCL-5	.37	37.63***			
	IUS			.42	5.91***	.17
	DBTP			.40	5.64***	.15
2	Dependent variable – PCL-5	.36	35.99***			
	IUS			.36	4.88***	.12
	DBTP-r			.40	5.41***	.14
3	Dependent variable – PCL-5	.41	28.72			
	PA			.06	0.64 (ns)	.00
	IA			.42	4.72***	.11
	DBTP			.37	5.29***	.13
4	Dependent variable – PCL-5	.38	26.05			
	PA			.07	0.71 (ns)	.00
	IA			.38	3.72***	.07
	DBTP-r			.36	4.72***	.11
5	Dependent variable – PCL-5	.48	19.19			
	IUS			.25	3.23**	.04
	PN			.38	4.22***	.07
	PP			−.25	−3.56**	.05
	PH			.27	3.29**	.04
	PF			.04	0.41 (ns)	.00
	F			.09	1.23 (ns)	.01

Note. IUS-12 – Intolerance of Uncertainty Scale, total score; PA – Perspective IU; IA – Inhibitory IU; PN – Past Negative; PP – Past Positive; PH – Present Hedonistic; PF – Present Fatalistic; F – Future; DBTP – deviation from the balanced time profile coefficient; DBTP-r – revised deviation from the balanced time profile coefficient; PCL-5 – post-traumatic stress symptoms questionnaire, total score; ** p < .01, *** p < .001; ns – not significant.

The relationship between IU and the Past Positive may be the consequence of the fact that the scale itself showed an insufficient level of consistency in this sample (α = .48; N = 129). This scale regularly shows the lowest consistency scores in other studies as well (Sircova et al., 2014). However, the reason for the low concurrency may be the specifics of the sample: even with a calm, good childhood, events and memories of service in a combat zone evoke an ambivalent reaction when assessing the 'positivity' of the past.

Associations with the Present Hedonistic TP may indicate a predisposition to avoiding stress, which is characteristic of people with a high intolerance of uncertainty level (Ouellet et al., 2019) and one of the post-traumatic stress symptoms.

The correlation between IU and Future TP is direct (Table 1), and not inverse, as in other studies (Walg et al., 2020; Yang et al., 2021). These results may be caused by several factors. Firstly, available studies of the relationship between attitudes towards the future and IU used either an extended version of the ZTPI Future scale (Chinese adjusted version; Yang et al., 2021) or a special questionnaire for attitudes towards the future (Subjective Probability Task; Durak Batıgün & Şenkal Ertürk, 2021). The difference between the used tests and the basic version of Future TP in the Zimbardo questionnaire lies primarily in the evaluative questions about the future (positive or negative expectations) and questions about belief in justifiability of the efforts. The basic version of Zimbardo's questionnaire contains questions mainly about planning and commitment to long-term goals and does not contain modal questions. Other researchers also pointed out the necessity to refine the Future TP in the classic Zimbardo questionnaire (Jankowski et al., 2020; Stolarski et al., 2020), as was done in the Norwegian version of the questionnaire, where there are two scales of the Future: negative and positive (Rönnlund et al., 2017). The worse the respondents feel about uncertainty, the more negative are their expectations from the future. Thus, the difference in the content of the questions about the future could give different results in the answers.

The second reason for the different results might be related to the specifics of the sample. From Table 1, it can be seen that the Perspective IU is associated with the Future, and not the Inhibitory IU. The Perspective IU scale contains questions on beliefs about the future and its surprises, mostly unpleasant, and associated with the desire to avoid or envisage them. This is why it is important to plan everything in detail and far ahead. The habit of planning is a necessary skill for the military, especially those with combat experience. This is a learned skill and it is reflected in a direct correlation between Perspective IU and Future TP. The Inhibitory IU, since it correlates with anxiety (Ouellet et al., 2019) and confusion

when faced with surprises, presumably, gave the reverse correlation between anxiety and the Future TP in the study by Walg et al. (2020) conducted on refugees. Perhaps the inconsistency between the bodily response to surprises (confusion, stupor) and the cognitive dimension (the belief that everything needs to be planned in advance) is more pronounced in the military. The attitude to the future in that case might be mediated, for example, by the tendency to dissociation, when the presence of emotional or physical discomfort when encountering surprises (Inhibitory IU) is either ignored or not even realized. But this assumption requires a separate study.

Comparison of time perspective in subgroups with different levels of IU revealed an evident difference on the PN scale and, with some reservations, there is a difference in the PF time perspective. Comparison of subgroups with different IU levels gave mixed results on the Future and further research is needed to clarify the differences in the time perspective scales in people with different IU levels in a larger and less specific (than military) sample.

The second aim of the study was to check how different coefficients of deviation from BTP reflect the relationship between IU and TP profile. The DBTP rate was not informative for correlation and comparative analyses, possibly because of specifics in its calculation as mentioned above. The revised formula of the DBTP-r coefficient (Jankowski et al., 2020) showed significant difference between subgroups. The presence of a correlation between the total IU score and DBTP-r may also testify in favor of a linear relationship between the IU level and TP imbalance, first of all, due to the PN and PF time perspectives. The respondents with a higher IU level are more likely to have a less balanced time-perspective profile.

At the same time, there were no significant differences for the regression analysis models when using DBTP-r or DBTP. As can be seen from Table 2, models with the independent variables DBTP and DBTP-r (models 1 and 2, respectively) have similar values of the coefficient R^2 and describe 36-37% of the variation. Both intolerance of uncertainty and deviation from a balanced time profile make a significant contribution to the symptomatology of post-traumatic stress. The joint contribution of two variables (the effect of their interaction) is not very large in the first model (5% of 37%) and more significant in the second (9.2% of 36%), which is reflected in the correlation analysis.

The third aim was to test the role of each IU and TP dimension in the development of PTS symptoms in a military sample. A separate analysis of the IU subscales (models 3 and 4) shows that it is Inhibitory IU that makes a significant contribution to the development of PTS symptoms, which coincides with the data obtained by Boelen (2019) when studying the relationship between IU and PTS symptoms in a sam-

ple of students. At the same time, this result does not support the data obtained in treatment-seeking military sample (Raines et al., 2019). Thus, the question remains open whether the difference in results was affected by the specifics of the sample (servicemen vs. civil), the severity of trauma or other variables which should be taken into account in further studies. For example, in the study of Bunducci et al. (2016) in the example of a clinical sample of veterans with a comorbid diagnosis with both PTSD and a substance use disorder, the direct effect of intolerance of uncertainty on PTSD symptoms turned out to be insignificant after accounting for shared variance with tolerance of emotional distress. However, intolerance of uncertainty served to amplify the effect of tolerance of emotional distress on PTSD symptom severity in that study (Bunducci et al., 2016).

Regression analysis in model 5 showed that the Present Fatalistic and Future TP do not significantly contribute to the of development PTS symptoms. This is interesting because the correlations analysis shows the relationship between PF and PTS symptoms, both in this study and in Papastamatelou's et al. (2020) research. Walg et al. (2020) obtained debatable results on the association of PF with PTSD. In this study, the result may be a consequence of the specifics of the sample, or evidence in favor of the fact that high scores on the PF scale are associated with a negative attitude towards the past to a greater extent than the actual situation of the present. Negatively assessing the past, people come to the conclusion about the inability to influence the events of their lives and a fatalistic view of current circumstances. According to Oyanadel and Buela-Casal (2014), higher indices on the PF scale are characteristic of respondents with diagnoses of depression and schizophrenia (there were no respondents with PTSD in their study). It is possible that the PF scale makes a greater contribution to the maintenance of depressive symptoms than PTS. From the data of our analysis, it follows that in the treatment of PTSD, it will be more productive to concentrate work on positive rethinking of the past, rather than developing a more optimistic view of the present.

LIMITATIONS

The specificity of the sample (the military with combat experience, despite the fact that this is not a clinical sample) to some extent limits the ability to generalize conclusions to a wider audience. The weak Cronbach α score of the Past Positive scale compels us to be careful with the conclusions about this time perspective. The cross-sectional study design limits the ability to draw inferences about causal relationships. Thus, additional research on associations between IU and time perspectives is necessary.

CONCLUSIONS

Despite the presence of restrictions, the study found a moderately significant relationship between the level of IU and the Past Negative time perspective, a weak but significant correlation between IU and Present Fatalistic, Present Hedonistic and Future TP. Groups that differ in the level of IU have a significant difference in Past Negative TP. Differences in Present Fatalistic and Future time perspectives in people with different IU level require additional confirmation. Respondents with a high level of IU have a greater deviation from the balanced time profile. To identify differences and correlations in the balanced time profile in people with different IU levels, the DBTP-r coefficient turned out to be more informative. Regression analysis models using DBTP as well as DBTP-r coefficients showed similar results. Inhibitory IU, not Prospective IU, turned out to be a predictor of PTS symptoms in a military non-clinical sample.

As temporal balance and uncertainty tolerance are constructs often seen as an intermediate link between lifespan events and psychopathology, further studies should determine to what extent their interaction contributes to affective (dis)regulation and psychological adjustment.

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