Intolerance of uncertainty in seriously injured veterans: a comparative analysis

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Abstract
Intolerance of uncertainty is seen as tendency to perceive unexpected and new circumstances as dangerous, and respond to them as a threat. It is known that the rejection of uncertainty is a factor that complicates the course and treatment of affective disorders (anxiety, depression, PTSD, sociophobia, etc.). The purpose of the research is to identify the relationship between intolerance of uncertainty and signs of PTSD in veterans with serious injuries or disabilities. Methods: using the parametric Student’s t-criterion and the non-parametric Mann-Whitney and Kruskal-Wallis test, a comparative analysis was performed, and the Spearman coefficient \( \rho \) was used to analyze the correlations. Data collected in two groups of servicemen were compared. Officers (n = 47) and veterans who participated in the qualifying round of the Invictus Games (n = 32) completed the Intolerance of Uncertainty Scale questionnaire, the N. Carleton’s short version, and the PCL-5 PTSD Symptom Questionnaire. Results: it was found that

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Інтолерантність до невизначеності розглянуто як властивість сприймати несподівані та нові обставини як небезпечні, та реагувати на них як на загрозу. Відомо, що неприйняття невизначеності є чинником, який ускладнює перебіг та лікування ефективних розладів (тривожність, депресію, ПТСР, соціофобію та ін.). Метою дослідження є визначення особливостей зв’язку інтолерантності до невизначеності з ознаками ПТСР у ветеранів з важкими пораненнями або інвалідністю. Методи: за допомогою параметричного критерію t-Стюдента та непараметричних критеріїв Манна-Уїтні та Краскала-Уоліса був проведений порівняльний аналіз, для аналізування кореляцій використаний коефіцієнт \( \rho \) Спірмена. Були співставлені дані, зібрані в двох групах військовослужбовців. Офіцери (n = 47) та ветерани, що брали участь у відбірковому турі змагань "Ігри Нескорених", (n = 32), заповнили опитувальники "Шкала інтолерантності до невизначеності", модифікована версія Н. Карлетона, та опитувальник симптомів посттравматичного стресового

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groups of servicemen do not differ in the general level of intolerance of uncertainty, but there was a significant difference on the scale of “depressing anxiety”. Subgroups with a higher level of intolerance of uncertainty have significantly more manifestations of post-traumatic stress symptoms. Intolerance of uncertainty correlates with all clusters of PTSD symptoms in the general military group, and the “Inhibitory anxiety” subscale has a stronger correlation with all clusters than the “Perspective anxiety” subscale.

**Conclusions:** For the first time, the connection between IU and signs of PTSD in servicemen was studied in the Ukrainian sample. Veterans with serious injuries and disabilities have higher scores on the “Inhibitory anxiety” subscale. The specificity of the connection between intolerance of uncertainty in veterans with serious injuries or disabilities, and signs of PTSD, is the lack of correlation with aggressive and self-destructive behaviour (symptoms of cluster E). This feature reflects the specifics of the experience and manifestations of aggression in veteran athletes with disabilities.

**Keywords:** intolerance of uncertainty, PTSD, veterans, comparative analysis, disability.

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**Introduction**

Researchers of intolerance of uncertainty study a person's attitude to the obscurity and unpredictability of the world around him or her. Today, in the English literature, tolerance and intolerance of uncertainty are studied as two related but separate constructs, because in English the difference in terminology is more noticeable and has led to the separation of the terms "tolerance for ambiguity" and "intolerance of uncertainty", respectively. Intolerance of uncertainty is understood as the property of an individual to perceive uncertainty as unacceptable, dishonest feature, and to react to it as a threat. Researches of intolerance of uncertainty (IU) are currently numerous and confirm the association of IU with a number of negative affective states. There is evidence that IU is a transdiagnostic factor that complicates the treatment of affective disorders. K. Freeston's questionnaire and its short version made by N. Carleton (Carleton et al., 2007) are used to study IU as a transdiagnostic factor. In Ukraine, research on IU and its connection with negative emotional states has not been conducted, primarily due to the lack of translated, adapted and validated tools for this purpose.
The object of our study is the experience of intolerance of uncertainty in people with traumatic experiences, because IU affects the severity of symptoms of depression and PTSD (Fetzner et al., 2013; Saulnier et al., 2019). According to statistics on the distribution of clinical disorders of the Veterans Health Administration of the United States of America (Veterans Health Administration, USA), these diagnoses are, respectively, first and second in frequency in the servicemen (Trivedi et al., 2015). There are no official statistics available in Ukraine, so we will focus on international data, assuming that the distribution of diseases is similar.

There are still few IU studies that link attitudes to uncertainty with signs of PTSD. Most of them are made on a sample of civilians, usually students. In particular, the hypothesis that a high level of intolerance of uncertainty is a factor that increases vulnerability to stress was tested on students. Level of IU and a variety of symptoms (anxiety, signs of PTSD) was measured before and after negative life events in two independent researches. Both studies confirmed that IU was a significant predictor of the development of signs of post-traumatic stress (Oglesby et al., 2016; Boelen, 2019).

The authors, who studied the relationship of IU with signs of PTSD in the servicemen, also found a significant contribution of intolerance of uncertainty in the development and maintenance of post-traumatic stress signs, in particular, in the symptoms of hyper arousal and reactivity. The samples consisted of servicemen who sought help in the clinic and were diagnosed with PTSD (Banducci et al., 2016; Raines et al., 2019), and demobilized veterans with combat experience (Zerach, Levi-Belz, 2019). The specifics of the attitude to uncertainty in veterans with serious injuries and / or disabilities in the world have not been studied. In Ukraine, the issue of the connection between intolerance of uncertainty and the development of negative emotional states and post-traumatic stress in the servicemen has also not been studied.

The probability of developing signs of PTSD, in addition to the presence of traumatic experience and individual characteristics, also has a social component: financial status, preservation / loss of emotional states did not conduct itself, passed through a crack, adapted and translated instrument for this purpose.

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The probability of developing signs of PTSD, in addition to the presence of traumatic experience and individual characteristics, also has a social component: financial status, preservation / loss...
of social status, the presence of social support from society and the surroundings. The research of the veterans of Afghanistan confirms the fact that there are much more adapted ones among socially active veterans than among socially passive ones; the severity of trauma (the presence of serious physical injuries, disability) significantly impede readaptation (Pidchasov, Lomakin, 2011). The connection with the symptoms of PTSD is reciprocal: the restriction of activity leads to manifestations of social psychological maladaptation, which exacerbates the symptoms of PTSD, which, in turn, actualizes alienation and leads to a decrease in social activity. Thus, rehabilitation and reintegration of veterans into peaceful life in personal, instrumental, spatial, temporal areas (Tytarenko, 2019) are important component of preventing the development of PTSD in veterans. The intolerance of uncertainty level should be the focus of attention as one of the strategies of a complex process of social psychological support at its diagnostic-target and community-communicative stages (Tytarenko, 2020).

The purpose of this study is to examine the relationship between intolerance of uncertainty and signs of PTSD in veterans with serious injuries or/and disabilities.

Methodology

Participants
The total sample consisted of two groups of servicemen. The sample No. 1 (hereinafter referred to as veterans) consisted of 32 servicemen who took part in the final selection for the Ukraine’s Paralympic team in 2019 to participate in the competition “Invictus Games” 2020. The selection criteria for the final were the presence of confirmed serious injuries or disabilities, the formation of the desire to undergo rehabilitation, the ability to work in a team, sports ethics and a proactive attitude. The research was conducted on a voluntary basis; participants were informed about the objectives of the study and signed consent to data processing. A total of 38 respondents filled in the questionnaires, of which 6 were excluded from further analysis due to the incomplete filling process or many gaps.
in the data. The mean age was 33.7 years (from 23 to 50 years, SD = 7.2).

Sample No. 2 (hereinafter referred to as officers) consisted of servicemen, mostly with combat experience, who passed a master’s program in one of the higher education institutions of the Ministry of Defence of Ukraine. The total number of respondents was 47 people, the mean age was 34.8 years (from 28 to 44 years, SD = 3.7).

Representatives of both samples filled in questionnaires, which are described in paragraph “Methodology”.

Methodology

Intolerance of uncertainty scale, a short version of N. Carleton. The "Intolerance of Uncertainty Scale" test, a short version by N. Carleton (IUS-12) adapted by G. Hromova (in press) is an abbreviated version of the questionnaire “Intolerance of Uncertainty Scale” by M. Freeston (Carleton et al., 2007; Freeston, 1994). The test has total score and subscales: Perspective anxiety and Inhibitory anxiety. Respondents were asked to answer the Likert scale to what extent they agree with each question, where 1 – completely disagree, 5 – completely agree. Maximum total score was 60.

The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). The PCL-5 questionnaire with criterion A is a 20-point test designed to measure the symptoms of PTSD according to the DSM-5 criteria for PTSD (Karachevskyi A. B., 2016; Bovin M. J., 2015). After identifying the worst event by criterion A, respondents answered questions about the various symptoms and the degree of their experience during the last month. The answers were rated using a five-point Likert-type scale ranging from 0 (not at all) to 4 (very strongly). Maximum possible total score is 80. Scores of 45 and higher indicate a significant probability of having PTSD. The Cronbach's alpha coefficient in the total sample was α = .94.

Stages of analysis

Initially, a comparative analysis of two servicemen groups was conducted on the level of the general score of intolerance of uncertainty and on subscales. Also, the data of two groups were compared to determine the difference in the level of post-traumatic stress signs in servicemen with і підписали згоду на обробку даних. Всього заповнили анкети 38 респондентів, з них 6 анкет були відбраковані через незавершений процес заповнення, або багатьох пропусків в даних. Середній вік склав 33.7 років (від 23 до 50 р., SD = 7.2).

Вибірка №2 (далі – офіцери) – це військовослужбовці, що переважно мають бойовий досвід, які проходили магістерську програму в одном з ВНЗ Міністерства оборони України. Загальна кількість респондентів 47 осіб, середній вік 34.8 (від 28 до 44 р., SD = 3.7).

Представники обох вибірок діагностувалися за представленими нижче методиками. Методики

Шкала інтолерантності до невизначеності, коротка версія Н. Карлетона. Тест "Шкала інтолерантності до невизначеності", коротка версія Н. Карлетона (IUS-12) в адаптації Г. Громової (готується до публікації) є скороченою версією опитувальника "Шкала інтолерантності до невизначеності" М. Фристона (Carleton et al., 2007; Freeston, 1994). Тест має загальний бал та дві шкали: тривога перед майбутнім і гнітюча тривога. Респондентам пропонується відповісти за шкалою Р. Лайкерта насильники зазначеного зовсім з кожним запитанням, де 1 – зовсім не типово для мене, 5 – дуже характерно для мене. Максимальний загальний бал 60.

Опитувальник на виявлення наявності симптомів посттравматичного стресового розладу (PCL-5). Опитувальник PCL-5 з критерієм А – це тест з 20 пунктів, розроблений для вимірювання симптомів ПТСР згідно з сучасним визначенням, зафіксованим в DSM-5 (Карачевський А.Б., 2016; Bovin M. J., 2015). Після ідентифікації найгіршої події за критерієм А, респонденти відповідають на запитання про різні симптоми і ступінь їх переживання впродовж останнього місяця. Відповіді оцінюються за шкалою Р. Лайкерта від 0 (зовсім ні) до 4 (дуже сильно). Максимальний загальний бал 80. Про значну вірогідність наявності ПТСР свідчать бали 45 і вище. Коефіцієнт алфава Кронбаха в загальній вибірці склав α = .94.

Етапи аналізу

Спочатку був проведений порівняльний аналіз групи ветеранів з групою офіцерів за рівнем загального балу інтолерантності до
different levels of IU. The analysis was performed using Student’s t-test and Mann-Whitney U-test.

In the second stage, a correlation analysis of IU scores and PTSD symptoms was performed for the entire sample of veterans and for subgroups formed by the level of intolerance of uncertainty (the nonparametric Spearman’s criterion ρ was used). The calculations were performed using the program for statistical data processing SPSS 23.0.

**Results**

The servicemen groups total score and subscales descriptive statistics of intolerance of uncertainty are presented in Table 1.

Comparison of the group of veterans with the group of officers on the general scale of the IUS-12 questionnaire did not show a significant difference in the level of intolerance of uncertainty. But a comparison of the mean values on the subscales (Student’s t-test) made it possible to conclude that there was a significant difference between the groups on the "Inhibitory anxiety" subscale (p <.05). The average values of невизначеності та за субшкалами. Також дані двох груп були співставленні між собою для визначення різниці у рівні прояви ознак пост-травматичного стресу у військовослужбовців з різним рівнем ІН. Аналіз проводився за допомогою t-критеріїв Стюдента та U-критеріїв Манна-Уїтні.

На другому етапі був проведений кореляційний аналіз показників інтолерантності до невизначеності та симптомів ПТСР для всіх вибірки ветеранів і для підгруп, сформованих за рівнем інтолерантності до невизначеності (використовувався непараметричний критерій ρ Спірмена). Розрахунки проводились за допомогою програми для статистичної обробки даних SPSS 23.0.

**Результати**

Описові статистики відповідей двох груп військових за загальним балом інтолерантності до невизначеності та за субшкалами представлені у табл. 1.

Співставлення групи ветеранів з групою військових за загальним балом інтолерантності до невизначеності та за субшкалами представлені у табл. 1.

<table>
<thead>
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<th>Scales Шкали</th>
<th>α</th>
<th>M</th>
<th>SD</th>
<th>Skew Асиметрія</th>
<th>Kurtosis Ексцес</th>
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<td><strong>Veterans, n=32</strong> Ветерани, n=32</td>
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<tr>
<td>IUS-12 Total</td>
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<td>11.19</td>
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<tr>
<td>PCL-5</td>
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<td>-.21</td>
<td>-.15</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>IUS-12 Total</td>
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<td>29.96</td>
<td>5.6</td>
<td>.6</td>
<td>.97</td>
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<tr>
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<td>11.1</td>
<td>1.5</td>
<td>3.3</td>
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<tr>
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<td>19.8</td>
<td>15.8</td>
<td>.67</td>
<td>-.34</td>
</tr>
</tbody>
</table>

**Note:** IUS-12 Total - total score of the questionnaire "Intolerance of Uncertainty Scale"; IUS-12 PA - “Perspective anxiety” subscale; IUS-12 IA - “Inhibitory anxiety” subscale; PCL-5 - the total result of the PTSD symptoms questionnaire.

**Примітка:** IUS-12 Total – загальний бал опитувальника "Шкала інтолерантності до невизначеності"; IUS-12 PA – субшкала "тривога перед майбутнім"; IUS-12 IA – субшкала "гнітюча тривога"; PCL-5 – загальний результат по опитувальнику симптомів ПТСР.
of Inhibitory anxiety were higher in groups of veterans with serious injuries.

Then the general group of servicemen (n = 79) was divided into two subgroups, formed by the level of intolerance of uncertainty (up to 29 points, and more than 31). Mann-Whitney U test revealed that there was a significant difference between two subgroups in the level of PTSD symptoms. That is, in the group with a higher level of intolerance of uncertainty, there were more of the post-traumatic stress signs, and this difference was significant for all clusters of symptoms.

According to the general level of PTSD signs, the group of veterans differs from the group of officers by higher scores. In the group of veterans, the number of people with a very high risk of developing PTSD (PCL-5 > 45) reached 19.0%, and in the group of officers it was only 2.0%.

As it can be seen from the Table 2, IU has a strong correlation with all clusters of PTSD symptoms. Weaker association is only with the group of symptoms related to changes in hyper arousal and reactivity, exaggerated startle response, excessive starting reaction, problems with concentration and sleep. Inhibitory anxiety has a stronger connection with all types of post-traumatic stress reactions than the scale of Perspective anxiety, except for the cluster E.

In the group of officers, no correlations were found between IU and signs of PTSD, because the vast majority of respondents had zero or close to zero values in the PCL-5 questionnaire.

Correlation analysis of IU with signs of PTSD in the group of veterans gave a completely different picture. The overall IU score correlated with all clusters of PTSD symptoms, only the subscales were not associated with marked alterations in arousal and reactivity. A thorough analysis of the correlations of IU with the items included in cluster E showed that in the group of veterans the “Perspective anxiety” subscale significantly correlated with a sense of alertness and hypervigilance (ρ = .41, p < .05). At the same time, “Inhibitory anxiety” had a positive correlation with complaints of problems with concentration (ρ = .49, p < .01) and sleep (ρ = .57, p < .01) at a statistically significant level.
Discussion

The comparison of two groups of servicemen in terms of the general level of intolerance of uncertainty did not show significant differences. At the same time, in absolute terms, the level of IU in the group of officers was slightly lower. The significant difference between groups of veterans and officers was on the “Inhibitory anxiety” subscale. This result may be due to the fact that officers have been taught and trained to act in conditions of uncertainty and therefore they respond to its presence more calmly. Another reason for the difference in the level of Inhibitory anxiety may be that in the group of veterans with serious injuries, the experience of encountering unforeseen events had catastrophic consequences for life and health, and test questions indirectly activated these memories, affected feelings and responses.

Table 2. Correlations between clusters of PTSD symptoms and intolerance of uncertainty, Spearman's rank correlation ρ

Таблиця 2. Кореляційні зв'язки між кластерами симптомів ПТСР та інтолерантністю до невизначеності, ρ Спірмена

<table>
<thead>
<tr>
<th>Scale</th>
<th>IUS-12 Total</th>
<th>PA</th>
<th>IA</th>
<th>PCL-5</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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</table>

Note: * - the correlation is significant at the level of 0.05; ** - correlation is significant at the level of 0.01; IUS-12 - N. Carleton's test of intolerance of uncertainty; PA - Perspective anxiety; IA - Inhibitory anxiety; clusters of PTSD symptoms: B - intrusions; C - avoidance behaviour; D - negative changes in thoughts and moods; E – marked alterations in arousal and reactivity; PCL-5 - the total score of the PTSD symptoms questionnaire.

Примітка: * – кореляція значуща на рівні 0,05 (другостороння); ** – кореляція значуща на рівні 0,01 (другостороння); IUS-12 – тест інтолерантності до невизначеності Н. Карлетона; PA – тривога перед майбутнім; IA – гнітюча тривога; кластери симптомів ПТСР: В – інтрогії; С – поведінка уникнення; Д – негативні зміни в думках та настрої; Е – негативні зміни у процесах збудження і реактивності; PCL-5 – загальний результат по опитувальнику симптомів ПТСР.

Discussion

Співставлення двох груп військовослужбовців за загальним рівнем інтолерантності до невизначеності не показало значущих відмінностей. Водночас, “гнітюча тривога” має однакову кореляцію із скаргами на проблеми з концентрацією (ρ = 49, p < 0.01) та сном (ρ = 57, p < 0.01) на статистично значущому рівні.
In the group of veterans, the level of post-traumatic stress signs was much higher than in the group of officers. Primarily, this was due to the difference in the number and severity of combat experience and injuries. This connection was well studied and proven (Humeniuk, Fedchuk, 2016; Steele, 2017). A secondary factor might be the difference in the level of Inhibitory anxiety, which increased vulnerability to stress.

At the same time, the correlation analysis did not show an association of IU in Ukrainian veterans with symptoms of hyperarousal and reactivity, which differs from data obtained from American servicemen and students in previous studies (Fetzner et al., 2013; Oglesby et al., 2016; Oglesby, Gibby et al., 2017; Raines et al., 2019). This might be due to the specifics of the sample, as the group of veterans consisted mainly of motivated veterans who tamed their emotions. Correlation analysis of the answers to the questions of cluster E clarified the following: intolerance of uncertainty in veterans was associated with vigilance and problems with concentration and sleep. Examples of the IU correlation with sleep difficulties were studied previously and an indirect effect of IU on sleep quality due to anxiety and sensitivity to anxiety was found (Lauriola et al., 2019). Significantly fewer points were scored by the cluster's answers regarding outbursts of aggression towards others, self-destructive behavior and exaggerated startle response. The reason for this difference might be precisely in the specifics of the aggression experience in athletes with disabilities, in particular their inherent “positive aggression” (Gluhova et al., 2017: 89). One of goals and value of participation in the “Invictus Games” is the opportunity to undergo rehabilitation, i.e. the achievement is the performance and participation in the competition, not victory, not the desire to get a result at any cost. This orientation shifts the expression of aggression from themselves or others to the process of preparation for competition. From a prognostic point of view, this distribution of responses in this cluster allows to make a positive assessment of the veterans’ state, because previous studies have found a correlation between the level of post-traumatic stress signs and the level of intolerance of uncertainty.
of hyper arousal symptoms with difficulty in recovery and chronic PTSD (Marshall, 2006).

In the group of veterans, the level of IU significantly correlated with all clusters of symptoms of post-traumatic stress. Similar results were also obtained from samples of civilians (Fetzner et al., 2013) and African-American servicemen (Hollingsworth et al., 2018), although some researches did not confirm the contribution of IU to the development of negative changes in thoughts and moods (Raines et al., 2019) or re-experiencing a traumatic event-intrusions (Oglesby, Gibby et al., 2017). There is an assumption that the type of traumatic experience may affect the characteristics of uncertainty and the severity of certain signs of post-traumatic stress (Raines et al., 2019). For example, the presence of traumatic childhood experiences and the level of IU differently affect the choice of coping strategies and emotional reactions in overcoming stress (Hromova, 2020). But this connection needs further study.

Conclusions
Results of IU level comparing in two groups of servicemen showed that veterans differ from officers primarily in the "Inhibitory anxiety" subscale. According to the intolerance of uncertainty total score, no significant difference has been found.

A distinction of the correlation of intolerance of uncertainty level with signs of post-traumatic stress in the group of veterans with serious injuries is the lack of significant connection with the cluster E – hyper arousal and reactivity, in particular, outbursts of aggression and self-destructive behavior. This difference reflects the specifics of the experience and expression of aggression in athletes with disabilities.

Servicemen with a higher level of intolerance of uncertainty differently affect the choice of coping strategies and emotional reactions in overcoming stress (Hromova, 2020).

Acknowledgements
The author expresses gratitude to the public organization "Come Back Alive" for cooperation and support in collecting data for the study.

Retaining a result for any price. This commitment shifts the manifestations of aggression from self or surroundings in the process of preparing for a fight. From a prognostic perspective, this distribution of responses in this cluster provides a positive evaluation of veterans, as preliminary studies have revealed a connection between the level of symptoms of hyperarousal and difficulty in recovery and chronic PTSD (Marshall, 2006).

In the group of veterans, the level of IU significantly correlated with all clusters of symptoms of post-traumatic stress. Similar results were also obtained from samples of civilians (Fetzner et al., 2013) and African-American servicemen (Hollingsworth et al., 2018), although some researches did not confirm the contribution of IU to the development of negative changes in thoughts and moods (Raines et al., 2019) or re-experiencing a traumatic event-intrusions (Oglesby, Gibby et al., 2017). There is an assumption that the type of traumatic experience may affect the characteristics of uncertainty and the severity of certain signs of post-traumatic stress (Raines et al., 2019). For example, the presence of traumatic childhood experiences and the level of IU differently affect the choice of coping strategies and emotional reactions in overcoming stress (Hromova, 2020). But this connection needs further study.

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A distinction of the correlation of intolerance of uncertainty level with signs of post-traumatic stress in the group of veterans, that has serious injuries, is the lack of significant connection with the cluster E – hyper arousal and reactivity, in particular, outbursts of aggression and self-destructive behavior. This difference reflects the specifics of the experience and expression of aggression in athletes with disabilities.

Servicemen with a higher level of intolerance of uncertainty differently affect the choice of coping strategies and emotional reactions in overcoming stress (Hromova, 2020). A significant connection does not occur.

Acknowledgements
The author expresses gratitude to the public organization "Come Back Alive" for cooperation and support in collecting data for the study.

Инновации
В результаті порівняння двох груп військовослужбовців за рівнем інтOLERАНТНOSTI до невизначеності можна стверджувати, що ветерани відрізняються від офіцерів насамперед за субшкалою "гнітюча тривога". За загальним балом інтолерантності до невизначеності значущої різниці не встановлено.

Особливістю кореляції інтолерантності до невизначеності з ознаками посттравматичного стресу в групі ветеранів, що мають важкі поранення, є відсутність значущого зв'язку з клас-тером "Е" – гіперзбудження та реактивність, зокрема, спалахів агресії та самопошкоджуваль-ної поведінки. Ця відмінність відображає специ-фіку переживання та прояву агресії у спортсме-нів з обмеженими можливостями.

Hromova Hanna
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Intolerance of uncertainty in seriously injured veterans: a comparative analysis


