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Original Article

Post-traumatic stress disorder among elite athletes affected by war

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Abstract.
Introduction. Current research on the Russian-Ukrainian conflict explores various aspects of psychological distr ess among affected individuals. However, there is a lack of information regarding post-traumatic stress disorder (PTSD) among Ukrainian athletes affected by the conflict. Objective: In this study we aimed to investigate the prevalence of PTSD among Ukrainian athletes affected by the ongoing war. **Materials and methods:** A total of 163 Ukrainians with varying degrees of exposure to the war participated in the study. Among them, 109 (67%) were non-athletes, while 54 (33%) were athletes. Non-athletes were individuals who remained in Ukraine after the onset of the conflict. Athletes with many having traveled for competitions and subsequently returned to Ukraine. This study used the primary care PTSD screen for DSM-5 (PC-PTSD-5). According to this method, the main scales are: anxiety, depression and post-traumatic stress disorder. Additional stress disorder scales were used as a supplement to the main questionnaire. **Results** The results show the prevalence of PTSD in the general sample compared to the general population. 54.4% persons reported PTSD. Non-athletes felt more in danger and threatened than athletes. We hypothesize that stress resistance in athletes supports the ability to reduce the effects of post-traumatic stress. The results of clinical symptoms was obtained that athletes avoid negative memories associated with military situations compared to non-athletes. This demonstrates that athletes are very busy with the training process. Non-athletes lack this tendency. In conclusion, we argue that the consequences of PTSD in athletes are lower than in non-athletes, and this may be an opportunity to prevent PTSD through sport. **Conclusions** The obtained studies show a connection between the war situation and the development of post-traumatic stress syndrome in people. A higher level of stress resistance in athletes has been established. This manifests itself in resistance to traumatic stress.
Keywords: post-traumatic stress disorder, Ukrainian athletes, war situation

Introduction

Traditional post-traumatic stress disorder associated with strong environmental stimuli, social or political disasters. Among all the events that provoke psychological disorders, war is the most traumatic event (Kokun 2023). With the beginning of the Russian-Ukrainian war on 22.02.2022, the entire Ukrainian population found itself in a military situation. This led to destruction, civilian casualties and mass flight of people from the war. The war negatively affects the state of mental health of all being in the Ukraine, which ultimately leads to the exhaustion of the nervous system mental health. (Bateman et al., 2019). Military conflicts associated with the forced relocation of people to safe regions and other countries, social problems and the development of chronic stress (Hamza et al., 2021). In connection with the increase in mental and psychosomatic disorders associated with the war, a professional analysis and further plan for the prevention and improvement of the psychosocial situation in Ukraine are needed.

The manifestation of mental and psychosomatic disorders in a war situation has serious consequences for the population of Ukraine. A negative result of war is the increase in the number of people with post-traumatic stress disorder (PTSD). A significant contribution to the high rates of PTSD is due to the numerous forced changes of residence and suffering from the sounds of war (Vanderheyden et al., 2014; Aron et al., 2019;). A significant number of people are in a state of constant anxiety for themselves, their children, and their relatives, which negatively affects their state of mental health (Kakaje et al., 2021).

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PTSD is a mental disorder that can be caused by a traumatic event, short as well as long-term. It can cause lasting emotional distress and can manifest as a delayed reaction to the event (Lynch et al., 2021). Individuals with existing PTSD, including complex PTSD, have a number of different symptoms, which in turn are associated with a large number of different disorders especially functional disorders (Alzoubi et al., 2018). In some studies compared PTSD to other disorders: anxiety (Kristensen et al., 2015; Moitra et al., 2014), depressive disorders (Hatch et al., 2018), psychotic disorders (Haase et al., 2009) and acute distress disorders (Compean et al., 2019).

Over time, each symptom tends to increase in severity and interfere with the person's normal functioning as experience before the traumatic event. PTSD is often accompanied by traumatic memories, flashbacks, depersonalization from events that have occurred, high levels of aggression, increased sensitivity to similar situations, psychopathological fear of experiencing new traumatic events, a desire to avoid them, and loss of important memories of the traumatic event. Increased alertness is usually observed in the first months after injury (Gil et al., 2022; Miles et al., 2020).

Some studies have established the duration and severity of acute mental reactions to post-traumatic events. Prolongation of emotional disorders up to two days has been established (Wiseman et al., 2022). As a result, behavioral disturbances are observed: escape, aggression or even suicide (Stanley 2021).

Traditionally, in sports practice, post-traumatic disorders arise from injuries or overstrain due to non-optimal training load. Therefore, athletes have higher levels of post practice resistance than non-athletes (Lawrence et al., 2010). However, real-world data on the behavior of athletes with war-related PTSD are lacking. High levels of post-traumatic reactions in athletes can be compensated for by physical activity (Oppizzi et al., 2018).

The very big problem of modern Ukraine is the unsafe situation associated with the war and the training process of athletes. All athletes from Ukraine are forced to implement the training and competitive process in tense military conditions. Thus, a very important problem is the study of the impact of war on the mental abilities of athletes and the manifestations of post-traumatic stress disorders.

Purpose: In this study we aimed to investigate the prevalence of PTSD among Ukrainian athletes affected by the ongoing war.

Methods

A total of 163 Ukrainians with varying degrees of exposure to the war participated in the study. Among them, 109 (67%) were non-athletes, while 54 (33%) were athletes. Non-athletes were individuals who remained in Ukraine after the onset of the conflict. Athletes with many having traveled for competitions and subsequently returned to Ukraine. Those who took part in the survey have personal experience of the war at the time of the beginning of the invasion of Ukraine; they were at home or returned from the competition before the war.

When choosing methods for diagnosing the condition of Ukrainians, we took into account several features of testing. Methods were needed that were officially recognized as validated in psychology. Given the low level of English proficiency among the Ukrainian people, we chose methods that can be adapted to the Ukrainian language. Importantly the Institute of Practical Psychology lead by G. S. Kostyuk has provided conscientious work during the 30 years of independence of Ukraine in the adaptation of psychological tests, including diagnostics for our research question (Kokun et al., 2023).

This study used the primary care PTSD screen for DSM-5 (PC-PTSD-5). According to this method, the main scales are: anxiety, depression and post-traumatic stress disorder. Additional stress disorder scales were used as a supplement to the main questionnaire. All of these scales are related to the military environment and include: subjective perception of the level of severity of a stressful event (Williamson et al., 2022). To determine the manifestations of stress disorder and assess the severity of the impact of critical events on people who survived the war, a scale for subjective assessment of the severity of traumatic events was used. The Traumatic Event Severity Scale has been used to monitor people's actual condition after certain stressful events. This scale includes three subjective subscales: intrusion, avoidance, and excitability.

Ethical Statement. In this study, the ethical standards of human experimentation were approved by the Biomedical Ethics Committee in accordance with the Declaration of Helsinki. The research was carried out with the approval of the Ministry of Youth and Sports of Ukraine and the personal consent of the participants.

Participants were informed that there were no right or wrong answers and were encouraged to answer openly. Complete confidentiality was ensured. The study was conducted from late August to mid-September 2022 and taught for the 6th month of hostilities on the territory of Ukraine online in the form of Google questionnaires.

Statistical Analysis

Statistical processing of the obtained results was carried out using the “Statistica 12” program. Since the analyzed indicators had a non-normal distribution, the Wilcoxon rank sum test was used to determine a statistically significant difference between samples.

Results

Table 1 presents the results of screening for post-traumatic stress disorder among a general sample of Ukrainians in the fifth month after the start of Russian military aggression against Ukraine.

Table 1 Screening for PTSD among Ukrainians in the fifth month after the start of the war (%)

Questions	Answer "Yes"	Answer "No"
Q1	55.8	44.2
Q2	54.0	46.0
Q3	53.4	46.6
Q4	39.3	60.7
Total	202.5	197.5
M	50.625	49.375
SD	7.618	7.618

According to the results, more responses to PTSD Screening questions were "Yes This fact show the prevalence of post-traumatic stress disorder in the overall sample. Thus, among the study sample, more people have PTSD.

Table 2 shows the responses of non-athletes after the fifth month after the start of the war. Our data shows that more people answered "Yes." These results highlight the prevalence of PTSD among non-athletes compared to athletes.

Table 2 PTSD Screening among Ukrainians (non athletes) in the fifth month after the start of the war (%)

Questions	Answer "Yes"	Answer "No"
Q1	61.5	38.5
Q2	58.7	41.3
Q3	59.9	43.3
Q4	40.4	59.6
Total	220.5	182.7
M	55.125	45.675
SD	9.88	9.49

The table shows the results of screening of Ukrainian athletes in the fifth month after the start of the war. The data showed that the majority of athletes answered "No." This is due to the low level of post-stress disorders in athletes. Based on these results, we can conclude about the prevalence of post-stress disorder among non-athletes relative to athletes.

Table 3 PTSD Screening among Ukrainians (athletes) in the fifth month after the start of the war (%)

Questions	Answer "Yes"	Answer "No"
Q1	44.4	55.6
Q2	44.4	55.6
Q3	44.4	55.6
Q4	37	63
Total	170.2	229.8
M	42.55	57.45
SD	3.7	3.7

In the subsequent analysis, a number of individuals who answered "Yes" to all questions and "No" to all questions were analyzed to identify the characteristics of the manifestation of post-stress disorder (Table 4).

Table 4 Number of Ukrainian people who answered "Yes" or "No on PTSD Screening questions (%)

Answer	Athletes	Non athletes
Yes	16.5	21.1
No	30.1	13.8

The obtained result reflects differences in the manifestation of post-stress disorder in a military situation. Among non-athletes, 21.1% answered "Yes". This means that these individuals self-reported to have PTSD. But among non-athletes, only 13.8 people answered "No".

At the same time, in the survey there were more athletes who answered "No" (30.1%) than among non-athletes. Further, 16.5% athletes answered "Yes".

The dynamics of clinical symptoms PTSD are presented in Table 5. The intensity of PTSD was assessed by the level of involuntary memories and reactions to experienced events. According to this result, the intrusion subscale of athletes is found to have significantly lower mean scores than that of non-athletes. This fact indicates

the more intense perception of feeling threatened in non-athletes than in athletes. Moreover, in athletes mechanisms of stress resistance are more evident.

The subscale avoidance indicates post-traumatic reaction to avoid negative emotions. Our study show higher values of avoidance among non-athletes compared to athletes (Table 5). This reflects an attempt to avoid unpleasant memories among non-athletes. At the same time, as a result of sports activity, athletes have a reduced need to avoid unpleasant memories.

The resulting arousal is associated with a stress reaction to current events. These reactions lead not only to excitement, but also to the presence of a negative dominance of the brain centers and increased human experiences. In athletes the manifestation of excitability is less pronounced than in non-athletes (Table 5).

Table 5 Clinical symptoms of PTSD in athletes and non athletes

Persons/Subscales	Intrusion	Avoidance	Excitability
Athletes	10.76 7.36; 11.83	13.48 9.86; 15.48	11.40 8.62; 13.58
Non-athletes	15.88* 13.32; 17.26	16.70* 13.73; 17.26	15.30* 12.68; 16.84

Legend: * p =.05, for the comparison of athletes and non athletes

According to our results, the level of PTSD in athletes is lower than in non-athletes (Fig. 1). This correlated with PTSD symptom scores. Obtained fact indicates that athletes have compensatory mechanisms that prevent the negative consequences of post-traumatic stress disorder.

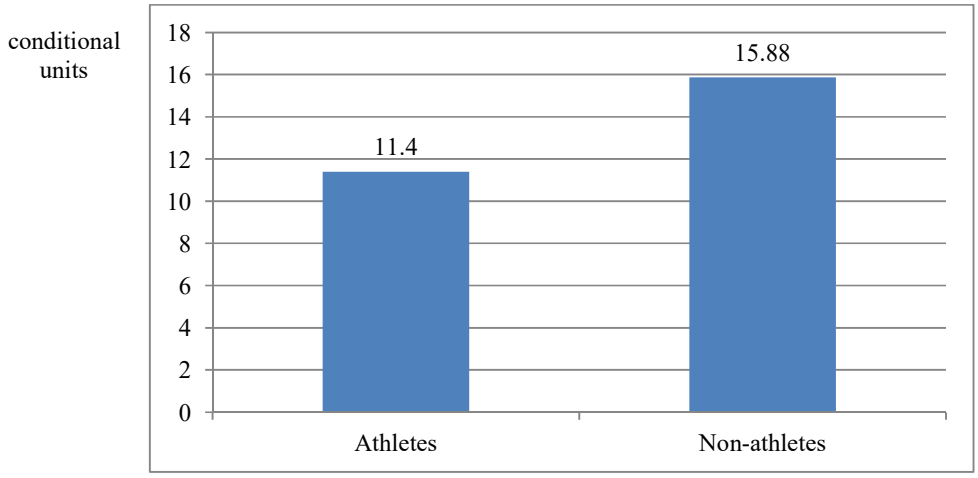

Figure 1. Integral indicator of symptoms of PTSD in athletes and non athletes

Discussion

War is an abnormal event for people. The war situation as a highly traumatic factor, that negatively influence to mental and psychosomatic states (Kokun 2023). As is known, traumatic events associated with specific emotions can lead to changes in mental defense strategies. Experiencing fear, anxiety, and distress in a traumatic situation can trigger PTSD. Subsequent recovery from the effects of post-traumatic stress disorder is highly problematic.

Despite the war, Ukrainian athletes continue to train and compete. In some sports, the results of Ukrainian athletes have improved since the beginning of the military aggression. Perhaps this is due to the activation of internal resources associated with the need to protect oneself from live-threatening danger.

Sport is accompanied by stress factors associated with competitive activity (Galea et al., 2005). As a result, athletes' stress levels increase before competition. But one of the ways to increase stress resistance is to improve competitive practice and participate in various competitions.

Due to the lack of data on the impact of post-traumatic stress disorders in war conditions on the mental state of Ukrainian athletes, research on this issue is very important.

Our results revealed a predominance of post-traumatic disorders among the individuals studied, especially among non-athletes. Moreover, non-athletes more felt unsafe and threatened than athletes. We argue that stress resistance in athletes support the ability to reduce the consequences of post-traumatic stress.

Our study shows changes in the mental states of athletes during war. However, the manifestations of post-traumatic stress disorder in athletes are less pronounced. This fact indicates that athletes have compensatory

mechanisms that prevent the negative consequences of military stress. We believe that this is due to the ability of athletes to immerse them in the training process. Our study provides evidence that sport activity can reduce the effects of war-related post-traumatic stress. Our results can be used to develop a program for the prevention of post-traumatic stress. The findings support the suggestions of some authors about the relationship between post-traumatic stress disorder and previous stressful events (Clarner et al. 2015; Spytska 2023).

Conclusions

The study found a link between the war situation and post-traumatic stress in athletes and non-athletes. It has been shown that athletes have a high level of mechanisms for preventing mental disorders and greater resistance to traumatic stress.

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Conflict of interest

The authors declare that there is no conflict.

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