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RESEARCH ARTICLE **OPEN ACCESS**

Social and Psychological Rehabilitation of Servicemen with Post-Traumatic Stress Disorder

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Abstract:

Introduction: The growing number of servicemen injured during the war in Ukraine creates a need for effective social and psychological rehabilitation and the identification of early signs of Post-Traumatic Stress Disorder (PTSD).

Aims: The aim of the study is to identify the need for psychological support for the rehabilitation of servicemen with PTSD.

Methods: The study employed the Primary Care PTSD Screen (Screen PC-PTSD), the Impact of Event Scale-Revised (IES-R), the 36-Item Short Form Health Survey (SF-36), and the Rogers-Diamond Socio-psychological Adaptation Test. The statistics were processed using descriptive statistics, analysis of variance, and regression analysis.

Results: This study reported that 29.65% of the servicemen showed signs of PTSD and observed symptoms of intrusion, avoidance, and hyperarousal. It was established that PTSD symptoms reduced the indicators of physical ($R2=0.634$, $p<0.001$) and psychological ($R2=0.607$, $p<0.001$) components of the quality of life of the servicemen, as well as socio-psychological adaptation ($R2=0.576$, $p<0.001$).

Conclusion: Among the studied servicemen, almost 30% demonstrated signs of PTSD, emphasizing the relevance of the studied problem. The identified negative impact of PTSD on the quality of life of the servicemen proved the importance of their complex social and psychological rehabilitation, involving the use of specific means at each stage. The obtained results can be used in the development of an algorithm for providing socio-psychological assistance to servicemen with signs of PTSD.

Keywords: Rehabilitation, Stress syndrome, Social adaptation, Psychological trauma, Quality of life.

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1. INTRODUCTION

The full-scale war, which is ongoing on the territory of Ukraine for the second year in a row, involves an increasing number of servicemen in active hostilities. Almost all of them, in one way or another, are subject to physical or psychological trauma. Constant shelling, physical injuries, capture, and loss of relatives or loved ones are all traumatic events that provoke severe stress

and may cause PTSD in case of failure to successfully overcome it. PTSD is a consequence of severe emotional disturbances under the influence of negative stressors [1]. Servicemen with PTSD are more likely to have psychosocial impairments [2] and problems with social integration [3]. Most researchers note that PTSD symptoms develop in approximately 30-35% of servicemen who participated in combat operations and were injured [4]. The main reason for untimely seeking assistance is the feeling of shame for showing weakness [5]. Two-thirds of servicemen with PTSD ignore the symptoms of the disorder completely [6]. This leads to social maladaptation and violation of the main aspects of readaptation in society.

Returning to a peaceful life, the psychological state of servicemen deteriorates greatly because they do not perceive a different reality [7]. The main consequences of this are problems in adapting to society and peaceful conditions, re-professionalization, and social integration [8]. Therefore, many military personnel attempt to return to combat, but returning too early may put them at risk of re-traumatization [9]. The accumulation of stress and negative emotions provokes the complication of PTSD symptoms [10]. There are cases of suicides that occur against the background of mental neuroses and depressive states [11]. Servicemen are not inclined to actively seek professional assistance, so this problem remains hidden and urges the need for qualified socio-psychological assistance for such servicemen at the same level as physical rehabilitation [12].

The essence of the rehabilitation of servicemen who took part in military operations is to restore the full functioning of the individual. At the same time, socio-psychological rehabilitation is part of the general rehabilitation complex, which aims to restore impaired mental functions [13], social status, and well-being of servicemen [14]. The basis of socio-psychological rehabilitation should be the creation of supportive strategies, which should include programmes to reduce stress, change maladaptive behaviour to socially acceptable forms, and develop psycho-emotional stability [15, 16].

In most cases, only medical and physiological care is provided to military personnel, while psychological rehabilitation is secondary care [17]. In these conditions, treatment of PTSD is reduced to relieving symptoms, while functional impairments associated with trauma and negative experiences because of injury or loss are ignored [18]. At the same time, it is noted that specially created psychological rehabilitation programmes can achieve effective significance in reducing PTSD symptoms. More than 1/3 of PTSD cases can be successfully treated, which has a positive effect on the social readaptation of servicemen [19, 20].

The aim of the study is to identify the relationship between PTSD symptoms and the physical and mental health of servicemen, which proves the need for their psychological rehabilitation. The aim involves the fulfilment of the following research objectives:

1) Carry out primary screening for signs of PTSD in the servicemen;

2) Determine the degree of the physical and mental component of the psychological health of the servicemen;

3) Identify the impact of PTSD on the indicators of physical and psychological health of the servicemen.

A research hypothesis was advanced based on the aim and objectives: post-traumatic stress disorder negatively affects the personality of servicemen, reducing their level of physical and mental health, which determines the need for the development of effective psychological rehabilitation programmes.

2. LITERATURE REVIEW

The main goal of Ukraine's national security is forecasting, timely detection, prevention, and neutralization of threats to the sustainable development of people and their vital interests [21]. The ongoing war in Ukraine is the most traumatic factor that determines the well-being of people. At the same time, it causes significant trauma to citizens, in particular to servicemen, who take a direct part in hostilities. They need effective psychological rehabilitation to restore their mental health and emotional stability.

According to the Center for Excellence in Community Mental Health, psychological rehabilitation refers to a list of various services aimed at helping a person with psychological disorders restore full functioning in society [22]. Socio-psychological rehabilitation is a process of providing psychological assistance to people, which aims to achieve the optimal level of independent functioning of a person in society and improve his/her quality of life [23].

The main purposes of socio-psychological rehabilitation of servicemen who participated in hostilities are the normalization of the psycho-emotional state, restoration of disturbed mental functions, readaptation and resocialization, and promotion of harmonization of interpersonal interaction [4].

Until recently, military rehabilitation in Ukraine was an outdated practice not supported by evidence-based medicine, in contrast to modern rehabilitation methods that have prospects for implementation [5]. However, the increasing number of servicemen injured in the war, many of whom have psychological disorders, requires new approaches to the psychological support of their rehabilitation. In particular, servicemen with PTSD deserve attention, as this disorder is hidden in nature but has a rather negative impact on their future lives [24].

According to the DSM-5-TR (APA) definition, PTSD is included in the new section of Traumatic and Stress Disorders and is caused by a traumatic or stressful event. The main diagnostic criteria of PTSD are negativism in thoughts and behaviour, changes in arousal and reactivity, and depressed mood [25]. PTSD is a disorder that arises as a result of a traumatic or stressful event and is characterized by a negative cognitive state and psychophysiological arousal over a period of time [26].

This disorder leads to loss and impairment of working

capacity, functional health problems, and complications of social and family relationships [15]. Moreover, suicides and suicide attempts are common among the servicemen. At the same time, the servicemen who received special psychological assistance are observed to improve their psychological state [11]. Sustainable, functional development is mental states that combine conscious and unconscious intentions [27], while PTSD involves disturbances in mental states that worsen the recovery process.

PTSD, which arises as a result of being in a combat zone, is accompanied by social and professional problems that lead to personality disorders [18]. The following problems are typical for servicemen with PTSD: disruption of intimate relationships [28], reduced work capacity, low self-esteem, and insufficient productivity [2]. PTSD is a disorder characterized by hypervigilance and intrusive memories of a traumatic event [17].

Factors causing PTSD among servicemen are divided into pre-combat stressors that occur during combat operations and post-combat stressors. They can affect with different strengths and intensities, but the consequences are always the same, which are disruption of the emotional sphere and interpersonal and social relationships [29]. In particular, researchers study the moral side of PTSD as a basis for providing assistance to servicemen. It is argued that the assessment of prerequisites, consequences, and empirical referents of moral harm to servicemen is a predictor of effective psychological rehabilitation [30, 31]. Therefore, psychological rehabilitation is the main issue not only for the servicemen themselves but also for the society into which they are integrated [32].

Initial psychological care for military personnel with PTSD should consist of “trauma-focused” psychotherapy, which focuses on the details of the trauma or related cognitive and emotional effects [33]. In this way, emergency psychological assistance is provided at the early stages of comprehensive rehabilitation.

Among the effective foreign practices of socio-psychological rehabilitation of military personnel with PTSD, forest therapy can not be ignored [34]. Forest therapy is a clinical application of the Shinrin-Yoku technique, which is also known as “forest bathing”. The essence of the technique consists of constant walks in nature, that is, “bathing in the air of the forest.” The technique of exposure therapy (exposure therapy), which is a method of cognitive-behavioral therapy and involves the intentional confrontation of the subject of therapy with disturbing situations, is also in demand. This technique has proven effective in working with the military [35]. Telepsychology has proven its effectiveness in reducing PTSD symptoms in war veterans. This therapy method is based on providing psychological services through video teleconferencing (VTC) and telephone counselling [36]. Virtual reality is one of the most effective methods of psychological rehabilitation of military personnel with PTSD today [37].

In Ukraine, rehabilitation programmes for servicemen are still poorly developed at the state level [38]. The growing number of injured combatants indicates an urgent need to create a comprehensive rehabilitation system, the key element of which should be psychological assistance to military personnel.

3. METHODS

3.1. Research Design

The study was conducted from September, 2023 to December, 2023 and involved 4 consecutive stages. The first methodological stage provided for determining the aim, objectives, and hypotheses of the research and the selection of appropriate diagnostic tools. The second stage involved diagnostics of the servicemen, as well as entering the obtained results into the database. The third stage involved data processing and interpretation of the obtained results. The fourth stage provided for drawing the conclusions of the research and outlining its prospects.

3.2. Sampling

The study involved 236 men aged 23 to 47 who participated in combat operations. The study was conducted at the National Military Medical Clinical Centre “Main Military Clinical Hospital” (Kyiv). All subjects were patients of this institution. The study was approved by the Commission on Bioethical Expertise and Research Ethics of the National Medical University, named after O.O. Bogomolets. As material for this study, the accounting medical documentation was used with the consent of the chief physicians and medical staff. Access to difficult patients in the hospital is limited, so the study was conducted with patients based on the Department of Medical Rehabilitation and Physiotherapy and the Therapeutic Department. Military personnel who were not seriously injured and were undergoing medical rehabilitation became the participants in the trial. The inclusion criterion was direct participation in hostilities. The exclusion criterion was the severe physical injuries of the patients, as they are an additional traumatic factor capable of influencing PTSD.

3.3. Methods

PTSD was detected in the servicemen using the method of Primary Care PTSD Screen (Screen PC-PTSD). This technique includes 5 items to identify people with probable PTSD. The test result is positive if the respondent answered yes to any three or more proposed options.

The study also used the Impact of Event Scale (IES-R). The test was developed by M. Horowitz in 1979. The author singled out two specific reactions of the individual to stress factors: “invasion” and “avoidance”. The technique was adapted in 2001 by N.V. Tarabrina.

The need for psychological rehabilitation of the servicemen was determined using the 36-Item Short Form Health Survey (SF-36). The questionnaire was developed in 1992, and it involves the assessment of health-related components of quality of life. In our case, two integral

indicators were considered: the physical component of health and the psychological component of health.

The Rogers-Diamond Socio-psychological Adaptation Test was conducted. The test contained 101 statements and a 7-point Likert-type response scale. Six subscales were identified in the test: adaptation, self-perception, acceptance of others, emotional comfort, internality, and striving for dominance.

The data were processed in Microsoft Excel and SPSS 22.0. Descriptive statistics, dispersion analysis, and correlation analysis were employed.

4. RESULTS

The study made it possible to identify those servicemen who have pronounced signs of PTSD among the sample population of respondents (Fig. 1).

It was established that a significant part of the servicemen are those persons who have pronounced symptoms of PTSD (29.65%). Such servicemen have pronounced symptoms of negative emotional experiences and violated the main aspects of resocialization. Such servicemen cannot fully integrate into society on their own, so they need socio-psychological support.

Indicators of PTSD symptoms among servicemen with different degrees of PTSD manifestation were also revealed (Table 1).

The obtained results indicated that the PTSD symptoms were most pronounced in military personnel with symptoms of PTSD, while the studied symptoms were within the normal range among the servicemen with partial symptoms and the absence of PTSD. The servicemen with the symptoms of invasion were constantly in a state of tension and had nightmares, and regular memories of a traumatic event did not allow them to relax emotionally. The avoidance symptom expressed the desire to escape from obsessive thoughts about the traumatic event, sometimes manifested by the abuse of alcohol and psychoactive substances. Irritability was expressed in attacks of anger and aggressiveness, hostility towards others, and mistrust.

The study identified two main components that reflect the quality of life of the servicemen with and without PTSD symptoms (Table 2).

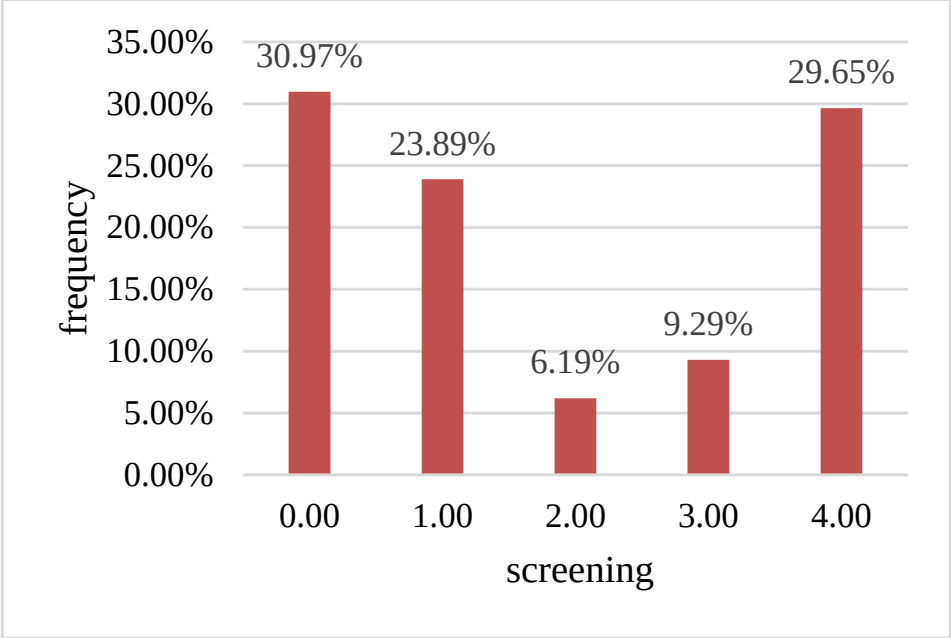

Fig. (1). Distribution of servicemen by level of PTSD manifestation.

Table 1. Indicators of PTSD symptoms in the servicemen (N=226).

PTSD Level	PTSD Symptoms					
	Intrusion		Avoidance		Hyperarousal	
	M	SD	M	SD	M	SD
no PTSD (n=70)	6.94	0.78	7.28	0.43	7.34	0.23
partial signs of PTSD (n=90)	7.58	0.66	9.21	0.77	8.81	0.59
PTSD (n=66)	21.12	1.55	19.43	1.25	19.78	1.62

Table 2. Indicators of the quality of life of the servicemen.

PTSD Level	PTSD Symptoms			
	Physical Component of Health		Psychological Component of Health	
	M	SD	M	SD
no PTSD (n=70)	52.55	14.52	44.07	15.07
partial signs of PTSD (n=90)	62.57	14.92	51.00	13.99
PTSD (n=66)	35.61	14.58	28.58	15.27

Table 3. Indicators of socio-psychological adaptation of the military.

PTSD s	Components of s-psychological s					
	Adaptation	Self-perception	Acceptance of Others	Emotional Comfort	internality	Striving for Dominance
	M±SD	M±SD	M±SD	M±SD	M±SD	M±SD
no PTSD (n=70)	148.46±53.28	56.97±23.33	34.81±17.43	36.44±17.79	36.16±22.27	11.27±5.35
partial signs of PTSD (n=90)	109.31±45.66	41.90±22.39	20.20±3.43	21.11±6.02	31.34±12.86	10.75±3.98
PTSD (n=66)	66.88±21.51	18.79±24.63	11.97±13.18	11.45±15.28	22.36±18.28	7.42±2.61

According to the obtained results, the servicemen with no PTSD and partial PTSD symptoms had a high level of physical and psychological quality of life. In other words, despite certain PTSD symptoms, they still fully functioned on a physical and psychological level. They could independently overcome certain emotional states or stressful manifestations. At the same time, low values of the physical and psychological components of the quality of life were found in the servicemen with a high manifestation of PTSD. This suggests that PTSD has a negative impact on the well-being of the servicemen, their psycho-emotional state, and physical functioning.

The obtained results made it possible to establish the level of socio-psychological adaptation of the servicemen with various manifestations of PTSD (Table 3).

Table 4. Regression analysis of the impact of PTSD on the quality of life of the servicemen.

Physical Component of Health				
PTSD Symptoms	**β**	**SD**	**R^2**	**F (p)**
PTSD	-4.25	0.61	0.634	37.13 (p≤0.001)
intrusion	1.41	0.28		
avoidance	0.12	0.37		
hyperarousal	-2.47	0.38		
Psychological component of health				
PTSD symptoms	**β**	**SD**	**R^2**	**F (p)**
PTSD	-3.87	0.62	0.607	32.27 (p≤0.001)
intrusion	1.39	0.29		
avoidance	-0.45	0.38		
hyperarousal	-2.19	0.39		
Socio-psychological adaptation				
PTSD symptoms	**β**	**SD**	**R^2**	**F (p)**
PTSD	-6.48	2.27	0.576	6.49 (p≤0.001)
intrusion	2.26	1.05		
avoidance	1.06	1.40		
hyperarousal	-4.35	1.41		

The obtained results established that the servicemen with no signs of PTSD had high adaptation, self-perception, acceptance of others, emotional comfort, and normative values of internality and dominance. The servicemen with partial PTSD symptoms had all components of social and psychological adaptation within normative values. The servicemen with PTSD had low adaptation, low self-perception, low emotional comfort, high externality (low internality), and low striving for dominance. These results indicated that military personnel with severe PTSD symptoms had low socio-psychological adaptation, impaired self-perception and relationships with others, a pronounced inclination to attribute their problems to external circumstances, and a low striving for dominance.

A regression analysis was performed to identify the impact of PTSD and its symptoms on the quality of life of the servicemen (Table **4**).

The obtained data indicated a statistically significant effect of PTSD on the physical and mental health of the servicemen. PTSD and PTSD symptoms explained 63% of the physical component of health (R2=0.634). In other words, a high manifestation of PTSD (β=-4.25±0.61) and hyperarousal (β=-2.47±0.38) were found to have the greatest impact on the physical component of the servicemen's health. Such disorders can be expressed in discomfort, sleep disturbance, problems with taking meals, the need to drown out negative emotions with alcohol, *etc*. The psychological component of health was 60%, determined by the presence of PTSD (R2=0.607). This means that a high level of PTSD (β=-3.87±0.62) and the hyperarousal symptom (β=-2.19±0.39) reduce psychological health. It is difficult for such servicemen to cope with the disorder on their own. They always mentally return to stressful events and cannot change the vector of their thoughts to the opposite. This worsens their relationships with others and social interaction. It was found that PTSD and its symptoms determined the socio-psychological adaptation of the servicemen by 58% (R2=0.576). It was found that a high level of PTSD reduced socio-psychological adaptation (β=-6.48±2.27), with the greatest effect exerted by the hyperarousal symptom (β=-4.35±1.41).

5. DISCUSSION

The obtained results showed that PTSD symptoms negatively affected the quality of life of servicemen who participated in hostilities. Almost a third of respondents in the entire sample were found to have PTSD symptoms, indicating a high need for providing them with psychological assistance. The main PTSD symptoms found in this study were the intrusion of obsessive thoughts and states, as well as manifestations of negativism in relation to others. It was difficult for them to adapt to a peaceful environment, readjust to society, return to the workplace, or simply function as a member of society. Each level of readaptation was found to involve certain difficulties that they could not cope with on their own.

It was found that the servicemen with PTSD have a rather low level of social and psychological adaptation, which is manifested in low self-esteem, rejection of others, emotional discomfort, reduced activity, and inability to dominate. It was established that PTSD is the cause of a decreased quality of life of the servicemen on a physical and psychological level. This proves that the servicemen who have certain traumas as a result of war additionally suffer from psychological problems, obsessive experiences, and emotional instability [39].

The obtained results are consistent with previous studies, where some researchers found that the rate of PTSD among servicemen is 32.8% [40], while others indicate 47% [41]. It is noted that the manifestations of PTSD negatively affect the quality of life and psychological well-being of servicemen [42], relationships with their close environment [28], and social reintegration [43]. Moreover, it is indicated that PTSD is a trigger for social isolation and loneliness in servicemen, causing them to become alienated in their relationships with society [8]. Therefore, the normalization of relationships with others is a priority in the rehabilitation of servicemen with PTSD [44].

Previous studies indicated that the simultaneous use of a combined approach to psychotherapy and cognitive rehabilitation, which ensures the development of social competence of servicemen, is promising in overcoming PTSD [3]. The high percentage of servicemen with persistent PTSD emphasizes the need for more comprehensive and accessible treatment in peacetime [37]. Recognizing and addressing factors that predict PTSD will help improve the mental well-being and social adjustment of servicemen [2]. The low level of seeking help in overcoming PTSD remains the main obstacle at this stage, which indicates the need for high-quality rehabilitation programmes created on the basis of empirically validated practices [7].

We offer virtual reality technology as a means of socio-psychological rehabilitation of military personnel with PTSD. Today, this effective method makes it possible to reduce emotional stress and return a person to social reality by simulating life situations. The advantage of VR technology is the ability to create interactive, safe three-dimensional environments. At the same time, VR allows you to record human behavioural reactions to situation models that simulate real crisis scenarios. Implementation of this technique will improve the socio-psychological condition of military personnel with PTSD without intrusive psychotherapy meetings, which not everyone agrees to.

CONCLUSION

The conducted research confirmed the fact that PTSD negatively affects the quality of life of servicemen after participating in hostilities. This makes the research results in the field of rehabilitation of servicemen, their readaptation, and reintegration relevant. Therefore, the mechanism of psychological support for the rehabilitation of servicemen with PTSD should provide for clearly defined goals at each stage of rehabilitation. The sooner

psychological assistance is provided to such servicemen, the more optimistic the forecast will be for their full return to peaceful life.

A limitation of the study is the low percentage of requests from military personnel for psychological assistance. Most of them do not show symptoms of PTSD in the early stages of returning to civilian life, so it is extremely difficult to diagnose its symptoms, which worsens their mental condition. In addition, it is important to distinguish between the mental and social consequences of PTSD in injured and non-injured servicemen, as physical trauma places additional stress on their psyche. Finally, the degree of individual perception of reality can also considered a limitation. It is individual characteristics and a personal threshold of sensitivity that determine factors in perceiving a stressful situation as traumatic and ensure resistance to such situations.

An age-based analysis of the spread of PTSD among servicemen is promising, as younger servicemen are more prone to stress disorders. It is also appropriate to establish the impact of stress and the occurrence of PTSD among high-ranking servicemen. One of the promising areas is the development of an effective algorithm for providing psychological assistance to servicemen with PTSD in parallel with medical rehabilitation.

AUTHORS' CONTRIBUTION

O.D.: wrote the manuscript; A.B.: Contributed to the concept or design of the study; R.D. and O.R.: Took part in data collection; S.S.: Carried out data analysis or interpretation of the results.

LIST OF ABBREVIATIONS

APA	=	American Psychological Association
DSM-5-TR	=	Diagnostic and Statistical Manual of Mental Disorders Text Revision
IES-R	=	The Impact of Event Scale-Revised
PTSD	=	Post-Traumatic Stress Disorder
SF-36	=	The 36-Item Short Form Health Survey
VR	=	Virtual Reality

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Commission on Bioethical Expertise and Research Ethics of the National Medical University named after O. O. Bogomolets, Ukraine under ethical approval number 5286/12.

HUMAN AND ANIMAL RIGHTS

Studies were conducted following the principles of the Declaration of Helsinki and International Ethical Guidelines for Health-related Research Involving Humans, Fourth Edition.

CONSENT FOR PUBLICATION

The respondents provided voluntary informed consent for conducting the research, which indicated anonymity, the purpose of the research, the use of data, and possible risks.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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