



Examination of military personnel's changed psychological states during long-term deployment in a war zone

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Título: Examen de los cambios en el estado psicológico de los militares durante el despliegue de larga duración en una zona militar.

Resumen: Una de las formas más eficaces para prevenir las consecuencias negativas del despliegue en la zona militar para la salud mental de los militares es diagnosticar su estado psicológico. En el presente estudio se determinan las particularidades de los cambios en el estado psicológico de los militares ($n = 192$) durante el despliegue de seis meses en la zona militar en el este de Ucrania. Los resultados obtenidos confirmaron ambas hipótesis formuladas: en cuanto a la posibilidad de determinar, sobre la base del diagnóstico del estado psicológico, el plazo recomendado para el despliegue de los militares en la línea de demarcación en el este de Ucrania, que es de tres meses. Así como también sobre las posibles diferencias significativas en la dinámica del estado psicológico de los militares que tienen y no tienen experiencia en el despliegue. Asimismo, se argumenta la necesidad de monitorear el estado psicológico de los militares durante el despliegue con el propósito de prevenir oportunamente las consecuencias negativas para su salud mental y para la ejecución exitosa de las tareas de la subunidad militar.

Palabras clave: Militares. Factores estresantes de combate. Despliegue. Estado psicológico. Salud psíquica.

Abstract: Examining military personnel's psychological states is an effective way to prevent negative mental health consequences during their deployment in a war zone. The present study identifies changes in the psychological states of military personnel ($n = 192$) during a 6-month deployment in a war zone in eastern Ukraine. The results confirmed both of our proposed hypotheses. First, with regard to time limits on military personnel's deployment on the front lines in eastern Ukraine on the basis of examined psychological states, the estimated recommended deployment duration was three months. Second, we found significant differences in the dynamics of the psychological states of service members with versus without previous deployment experience. The results also substantiate that military personnel's psychological states should be monitored during deployment in order to prevent negative mental health consequences and to ensure that military units successfully accomplish their tasks.

Keywords: Military personnel. Combat stressors. Deployment. Psychological state. Mental health.

Introduction

Military service is generally regarded as a highly stressful career (Krishnakumar et al., 2019). After all, a military workplace is a unique environment in which military personnel have experiences that differ from those in civilian jobs, as service members are confronted with psychosocial challenges created by an intense work environment (Redmond et al., 2015). Lo Bue (2015) pointed out that military service presents constant challenges: frequent stressful conditions, acting in situations with high uncertainty and lack of time, and a high cost for mistakes.

The stressful working conditions of military environments become even worse during deployment in a war zone, where they are characterised by increased danger and even greater responsibility. During deployment, military personnel are influenced by combat stressors (seeing dead human bodies, being attacked or ambushed, knowing someone who was injured or killed and handling dead bodies) as well as operational stressors (long deployments, uncertain redeployment date, separation from families and lack of privacy; Osório et al., 2018; Nassif et al., 2019; Shen et al., 2009).

The stressful impact of deployment on military personnel can be redoubled by engagement in hostilities, witnessing

acts or the need to make immediate decisions that may violate individuals' moral codes and personal values (Richardson et al., 2020). Potentially morally compromising war circumstances, as noted by Wortmann et al. (2017), could involve prescribed roles (e.g. maiming and killing), proscribed behaviours (e.g. the use of excessive force or cruelty), bearing witness to the aftermath of violence or terror (e.g. handling or uncovering human remains) or being a victim of others' failures to uphold a moral code. As a consequence, many service members and veterans suffer moral injury, characterised by guilt, shame, anger, social withdrawal, feelings of worthlessness, self-blame and spiritual distress (Nazarov et al., 2020; Wortmann et al., 2017). Warfare-related stress puts service members at risk for a range of mental health problems after they return from deployment (Sanders et al., 2019). However, according to Born and Zamorski (2018), deployment-related factors and exposure to potentially traumatic deployment experiences have the strongest and most consistent association with post-deployment mental health problems.

One of the most common effects experienced by service members after combat is posttraumatic stress disorder (PTSD; Hines et al., 2014; Kokun et al., 2020; Pietrzak et al., 2011; Sipos et al., 2014). In addition to PTSD, higher levels of cumulative combat experiences are also directly related to increased likelihood of anxiety, depression, alcohol abuse and suicidality (Bergman et al., 2017; Elnitsky et al., 2017; Johnson et al., 2018; Williams & Berenbaum, 2019). The most common issues reported by service members returning

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from combat deployments include anger and aggression (Wilk et al., 2015), risk-taking behaviours and sleep difficulties (Nassif et al., 2019), headaches, tremors and shaking, difficulty completing tasks, poor concentration, repeated fears and avoidance of social contact (Engelbrecht et al., 2018). Reyes et al. (2020) even reported the possibility of schizophrenia.

Based on the above, in our opinion, regularly examining service members' psychological states is an effective way to prevent negative mental health consequences related to their deployment in a war zone. In this context, research by Vermetten et al. (2016), Ordóñez-Cambor et al. (2016), Paniagua et al. (2016) and Fonseca-Pedrero (2018) has substantiated the extreme importance of regular traumatic experience assessment, and Seal et al. (2009) highlighted the need for targeted screenings and early interventions among military personnel. Dami et al. (2018) noted that military personnel's mental health should be assessed both before and after deployment to prevent the development of distress. Kelley et al. (2012) have noted necessity of an understanding of the optimal time stamp for interventions to attenuate health risk behaviours during the deployment cycle. A study by Martínez-Sánchez (2019) supported the need for psychological monitoring of personnel involved in military operations, especially those who had suffered adaptation difficulties during operations and/or had been involved in traumatic events (accidents, attacks, confrontations and combat). If the above-mentioned measures are not applied, it is obviously impossible to achieve one of the main goals of work and organisational psychology for service members, namely promotion of employees' well-being and performance (Peiró et al., 2014).

In our opinion, regular examination of service members' psychological states can reduce the negative effects of deployment on their mental health in two ways. The first is the definition of limits for deployment durations for a particular military troop based on when the psychological states of most service members start to deteriorate significantly so that the troop can return from deployment before this point. Since service members' psychological states are changed as a result of specific combat missions, it is necessary to define deployment duration limits depending on the dynamics of service members' psychological states as well as the country in which an armed conflict takes place, the specific service within the armed forces and the specific armed conflict.

The second way is to those individual service members in a particular military unit whose psychological states show clear deterioration before the end of a deployment period. The obtained information can be used to make a decision regarding early termination of participation for such service members, as further task execution in such altered states increases the risk to service members' mental health, in addition to jeopardising the success of combat missions and the life and health of other service members. This approach is justified by the fact that – as noted by Hernández-Varas et al. (2019) – although some requirements of military life

compromise an individual's mental and physical health and well-being, potentially hindering their professional performance and development, individual variability nonetheless leads to a wide range of responses, with some people struggling to handle hardships and others adapting quickly and maintaining a high level of performance.

As such, the present study aimed to determine changes in military personnel's psychological states during a long (6-month) deployment in a war zone in eastern Ukraine. Our first hypothesis (H1) was that we could determine the recommended duration for Ukrainian military personnel's deployment on the front lines in eastern Ukraine based on their examined psychological states. The second hypothesis (H2) was that the dynamics of Ukrainian military personnel's psychological states during deployment on the front lines in eastern Ukraine would differ for service members with versus without previous experience of deployment.

Method

Participants and Procedure

This study involved 192 Ukrainian service members who were deployed to a key front-line area in eastern Ukraine between October 2017 and October 2018 for a 6-month period. All participants were male. The age distribution of the total sample was as follows: 45.3% ($n = 87$) were between 18 and 29 years old; 31.8% ($n = 61$) were between 30 and 39 years old; 18.7% ($n = 36$) were between 40 and 49 years old; and 4.2% ($n = 8$) were between 50 and 58 years old. Regarding distribution of military ranks, 4.7% ($n = 9$) of the participants were commissioned officers, 33.3% ($n = 62$) were non-commissioned officers and 63.0% ($n = 121$) were soldiers. Of the total 192 service members, 108 (sample 1) were being deployed for the first time, while 84 (sample 2) had previous experience of deployment at a key front-line area in eastern Ukraine. Age and military rank distributions for samples 1 and 2 were the same.

During deployment, the service members in the study performed the following tasks: 1) serving on the demarcation line at the firing positions in the area of open enemy fire and participation in direct combat; 2) duty at observation places and checkpoints along the demarcation line; 3) performing combat missions in close proximity to the enemy in accordance with service members' military specialties (e.g. gunner-operator, gunner, liaison officer, observer, scout, shooter, machine gunner, grenade launcher, sniper); 4) equipping dugouts and company bases; 5) receiving and transmitting information via wired and radio communicative devices; 6) conducting reconnaissance and obtaining intelligence on enemy positions and possible objects (targets) of enemy attacks; 7) counteracting sabotage and enemy reconnaissance groups; 8) evacuating wounded from the combat zone; and 9) carrying out guard service (protecting equipment and warehouses) on the second line of defence. The above tasks executed by Ukrainian service members during the study vir-

tually eliminated the need to use a force against non-militarized people.

Four series of examinations were performed at 1 week before deployment, 1 month after the start of deployment, 3 months after the start of deployment and 6 months after the start of deployment. The first series of examinations was conducted in the military training centre, located far from the armed conflict zone. The second, third and fourth series were conducted directly at the place of service members' deployment. At the time of the fourth series, the service members in the study did not know when their deployments would end, as it had been originally planned to last for 12 months. But, soon after the fourth series, the command made a sudden decision to shorten the deployment term for Ukrainian service members at the key front-line area in eastern Ukraine to 6 months. Therefore, the respondents left quickly the deployment area and the study was completed. However, its duration, as the obtained results showed, was quite sufficient to test the hypotheses.

The studies were conducted with the approval of the General Staff of the Armed Forces of Ukraine and participants' personal consent. Participants were informed that there were no right or wrong answers and were encouraged to respond candidly. Complete confidentiality was assured.

Measures

The Ukrainian adaptation of the Combat Exposure Scale (CES; Keane et al., 1989) was used to measure the intensity of combat stressors. The CES is a 7-item self-report measure that assesses wartime stressors experienced by combatants. The CES is easily completed and scored and is useful in both research and clinical settings. Respondents are asked to answer based on their exposure to various combat situations, such as firing rounds at the enemy and being on dangerous duty (Appendix A). Items are rated on a 5-point frequency scale, ranging from no/never (0 points) to more than 50 times (4 points). The total CES score is calculated by summing weighted scores, which can be classified into one of five categories of combat exposure, ranging from light to heavy. The CES was used in the first and fourth series of examinations.

To diagnose psychological states, we used a modified method of scaled self-assessment based on the Scaled Self-Assessment of Psycho-Physiological State (Kokun et al., 2019). This technique allows a researcher to quickly and accurately evaluate various components of psychological state (by choice of the researcher). In particular, the scale has been demonstrated to be effective in investigating a person's psychological state while operating in complex and extreme conditions (Kokun & Bakhmutova, 2020; Kokun et al.,

2021). It is also important that this technique allowed us to evaluate deployment-specific indicators.

Respondents were asked to subjectively evaluate the specified indicators of their psychological state at the present moment by using a vertical line to mark corresponding places on the non-graded scales (straight lines of length 100 mm, where the left and right edges respectively indicate the minimum and maximum possible estimations of a certain characteristic; an example form is provided in Appendix B). Quantitative indicators (from 1 to 100) were obtained by measuring distance in millimetres from the left edge of each scale to the marked places. In our study, the first four scales characterise the psycho-physiological component of psychological state (well-being, activity, mood and performance) and the second three represent the personal-professional component (interest in service participation, desire to perform one's tasks in the deployment area and self-confidence).

Statistical Analysis

Statistical Package for the Social Sciences version 22.0.0.0 was used for statistical analysis. Descriptive statistics (mean, standard deviation, skewness and kurtosis) and an independent sample *t*-test were used. We used a paired samples *t*-test because data distributions for all indicators were close to normal (modulo sum of skewness and kurtosis less than 1).

Results

Table 1 compares the combat experiences of service members with versus without previous deployment experience. The results obtained in the first series confirmed the absence and presence of combat experience among service members in sample 1 and sample 2, respectively. All combat experience indicators were significantly higher in sample 2 ($p < .01$). The extensive combat experience in this sample was clearly determined by the following indicators: 'How often did you fire rounds at the enemy?' ($M = 2.05$), 'Did you ever go on combat patrols or have other dangerous duties?' ($M = 1.91$), 'Were you ever under enemy fire?' ($M = 1.91$) and 'How often were you in danger of being injured or killed (bullets, shells, melee weapons), ambushed, or in other very dangerous situations in the line of duty?' ($M = 1.55$). Combat experience in sample 2 was relatively low according to the three remaining indicators: 'How often did you see someone get hit by incoming or outgoing rounds?' ($M = 0.68$), 'What percent of the people in your unit were killed, wounded, or missing in action?' ($M = 0.55$) and 'Were you ever surrounded by the enemy?' ($M = 0.23$).

Table 1

Comparison of the combat experiences of service members without (sample 1) and with (sample 2) previous deployment experience before and 6 months after beginning the examined deployment

#	Combat experience indicators	Sample	Series					
			Oct 2017			Apr 2018		
			<i>M</i>	<i>SD</i>	<i>p</i> <	<i>M</i>	<i>SD</i>	<i>p</i> <
1	Did you ever go on combat patrols or have other dangerous duties?	Sample 1	.20	.75	.01	1.93	1.64	–
		Sample 2	1.91	1.54		2.05	1.66	
2	Were you ever under enemy fire?	Sample 1	.00	.00	.01	1.11	1.47	
		Sample 2	1.91	1.52		2.27	1.40	.01
3	Were you ever surrounded by the enemy?	Sample 1	.00	.00	.01	.17	.65	–
		Sample 2	.23	.69		.27	.59	
4	What percent of the people in your unit were killed, wounded, or missing in action?	Sample 1	.05	.22	.01	.17	.38	
		Sample 2	.55	.74		.80	.78	.01
5	How often did you fire rounds at the enemy?	Sample 1	.00	.00	.01	.42	.94	
		Sample 2	2.09	1.63		2.73	1.53	.01
6	How often did you see someone get hit by incoming or outgoing rounds?	Sample 1	.00	.00	.01	.06	.23	
		Sample 2	.68	.99		.79	.80	.01
7	How often were you in danger of being injured or killed (bullets, shells, melee weapons), ambushed, or in other very dangerous situations in the line of duty?	Sample 1	.13	.33	.01	.87	1.08	
		Sample 2	1.55	1.47		1.67	1.43	.01

The results of the first and second series showed significantly increased combat experience over the six months of deployment in sample 1 ($p < .01$ for all seven indicators) and a small, statistically insignificant (compared to the first series) increase in sample 2. For sample 1, combat experience increased most sharply according to the indicators ‘Did you ever go on combat patrols or have other dangerous duties?’ ($M = 1.93$), ‘Were you ever under enemy fire?’ ($M = 1.91$) and ‘How often were you in danger of being injured or killed (bullets, shells, melee weapons), ambushed, or in other very dangerous situations in the line of duty?’ ($M = 0.87$).

However, combat experience was the same for samples 1 and 2 ($p > .05$) according to two out of seven indicators: ‘Did you ever go on combat patrols or have other dangerous duties?’ and ‘Were you ever surrounded by the enemy?’ For the other five indicators, sample 2 service members’ combat experience remained significantly higher ($p < .01$), indicating that the intensity of combat stressors in previous deployments (in which service members from sample 2 had participated) was significantly higher.

Having presented the examined combat experience for both samples, we consider it sufficiently detailed to characterise the specific intensity of combat stressors during deployment, during which we examined service members’ psychological states. Table 2 presents the results of changes in self-assessment of the psycho-physiological component of service members’ psychological states during the 6-month deployment.

The results in Table 2 show that, in the first series, service members in sample 1 (who had not previously been de-

ployed) scored significantly higher on all four indicators describing the psycho-physiological component of psychological states (well-being, activity, mood and performance) compared with service members in sample 2 ($p < 0.01–0.05$). During the first month of deployment, service members in both samples showed a significant increase on all indicators ($p < 0.01–0.05$). Moreover, this increase was more pronounced among service members in sample 2 and the differences between the two samples in the second series became insignificant for three out of four indicators (except for well-being).

However, after 3 months of deployment (the third series), the scores of service members in both samples decreased significantly on all four psycho-physiological indicators compared to the second series ($p < 0.01–0.05$). In addition, these scores deteriorated more sharply in sample 1 (consisting of the service members without previous deployment experience) than in sample 2. In other words, all four indicators deteriorated significantly for sample 2 in the third series compared with the second series but still remained higher than in the first series. However, for sample 1, scores on all four indicators were significantly lower in the third series than in the first series ($p < 0.01–0.05$).

The results of the fourth series showed that, while all four psycho-physiological indicators for service members in sample 1 largely stabilised at the reduced level achieved in the third series, they continued to decline for sample 2 service members 3 months after the previous examination, reaching the lowest level in the last series.

Table 2
Changes in self-assessed psycho-physiological component of service members' psychological states over 6-month deployment

#	Indicators	Sample	Series								<i>p</i> <	No. of series
			1		2		3		4			
			Oct. 2017	Nov. 2017	Jan. 2018	Apr. 2018	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
1	Well-being	Sample 1	74.0	22.2	79.8	19.5	64.9	23.0	65.1	21.2	.05	1-2
			.01	.05	1, 2-3, 4							
		Sample 2	66.1	25.5	74.0	22.8	68.2	27.3	61.7	22.9	.05	1-2, 4; 2-3;
			.01	.01	3-4							
	<i>p</i> <	.05	.05	-	-						2-4	
2	Activity	Sample 1	72.9	20.9	78.6	17.5	63.5	22.0	63.6	21.0	.05	1-2
			.01	.05	1, 2-3, 4							
		Sample 2	66.4	22.9	76.2	21.9	71.8	22.8	60.0	23.7	.05	1-3, 4; 2-3
			.01	.01	1-2; 2, 3-4							
	<i>p</i> <	.05	-	.01	-							
3	Mood	Sample 1	73.1	20.1	78.9	19.7	68.4	21.0	71.5	19.8	.05	1-2; 2-4
			.01	.01	2-3							
		Sample 2	64.9	24.8	79.3	17.8	67.4	28.8	63.8	23.3	.01	1-2; 2-3, 4
			.01	.01								
	<i>p</i> <	.01	-	-	.01							
4	Performance	Sample 1	72.5	22.9	79.1	16.0	65.6	23.0	64.8	20.4	.05	1-2, 3, 4
			.01	.01	2-3, 4							
		Sample 2	67.3	24.7	76.4	24.1	72.1	27.1	59.0	28.5	.05	1, 2-3
			.01	.01	1-2, 4; 2-4							
	<i>p</i> <	.05	-	.05	.05							

Note: The last column shows *p*-value comparisons of the results of the samples in different series; *p* comparisons between samples in each series are given in the lower rows for each indicator.

Table 3 presents the changes in service members' self-assessments of the personal-professional component of their psychological states (interest in deployment participa-

tion, desire to perform service duties in the deployment area and self-confidence).

Table 3
Changes in self-assessed personal-professional component of service members' psychological states over 6-month deployment.

#	Indicators	Sample	Series								<i>p</i> <	No. of series
			1		2		3		4			
			Oct. 2017	Nov. 2017	Jan. 2018	Apr. 2018	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
1	Interest in deployment participation	Sample 1	70.8	27.2	79.4	20.7	63.0	30.5	60.8	27.1	.05	1-2, 3
			.01	.05	1-4; 2-3, 4							
		Sample 2	68.4	24.2	76.8	29.2	68.3	28.1	60.2	30.4	.05	1-2, 4; 2-3
			.01	.01	2, 3-4							
	<i>p</i> <	-	-	-	-							
2	Desire to perform service tasks in the deployment area	Sample 1	70.3	28.7	79.7	21.0	64.1	32.1	62.6	27.3	.05	1-3, 4
			.01	.05	1-2; 2-3, 4							
		Sample 2	73.6	28.0	76.8	28.5	70.1	29.8	60.7	31.7	.05	2-3
			.01	.01	1, 2, 3-4							
	<i>p</i> <	-	-	-	-							
3	Self-confidence	Sample 1	81.4	19.9	83.0	18.4	72.5	23.7	72.4	23.0	.01	1, 2-3, 4
			.01	.01	1-3; 2-3; 3-4							
		Sample 2	77.7	24.3	86.8	15.5	82.0	19.3	74.6	22.6	.05	1-2; 2-4
			.01	.01								
	<i>p</i> <	-	-	.01	-							

Note: The last column shows *p*-value comparisons of the results of samples in different series; *p*-value comparisons between samples in each series are given in the lower rows for each indicator.

Table 3 shows no significant differences between samples for the three personal-professional indicators in the first examination series, in contrast to the results obtained for the psycho-physiological component. However, as in the case of this component, both samples showed reliable increases on

all indicators during the first month of deployment (*p* < 0.01-0.05) and significant deterioration of all indicators (*p* < 0.01-0.05) in the third series compared to the second. Over the course of the next 3 months of deployment, service members from sample 1 showed stabilisation or slight

deterioration on these indicators, but service members from sample 2 showed continuous and rapid declines ($p < .01 - .05$).

Discussion

The study showed significantly increased combat experience over the course of 6 months of deployment in a key front-line area in eastern Ukraine for Ukrainian service members who were participating in deployment for the first time. This result is not surprising: analogous results have been obtained by Born and Zamorski (2018), Osório et al. (2018), Nassif et al. (2019) and Kokun et al. (2020). These service members' combat experience increased to the greatest extent on the indicators 'Did you ever go on combat patrols or have other dangerous duties?', 'Were you ever under enemy fire?' and 'How often were you in danger of being injured or killed (bullets, shells, melee weapons), ambushed, or in other very dangerous situations in the line of duty?' At the same time, these service members' combat experience became equal to the combat experience of those who already had deployment experience for only two out of seven indicators ('Did you ever go on combat patrols or have other dangerous duties?' and 'Were you ever surrounded by the enemy?'). For the other five indicators, the combat experience of service members in the second sample remained significantly higher. This indicates that combat stressors affecting Ukrainian service members during the studied deployment were relatively less intense than during previous deployments.

The results obtained in the four series of examinations showed that, before their first deployment, service members who had not previously been deployed had significantly higher scores on four indicators of the psycho-physiological component of their psychological states (well-being, activity, mood and performance) compared with experienced service members. However, three of the personal-professional indicators (interest in deployment participation, desire to perform service tasks in the deployment area and self-confidence) were not significantly different across samples.

Over the first month of deployment, all seven indicators of psychological state increased among service members from both samples, but this increase was more pronounced for service members with deployment experience. However, after 3 months of deployment, all indicators of psychological state decreased significantly among service members from both samples. At the same time, the deterioration measured by these indicators was significantly greater for inexperienced service members. The last series, conducted 6 months after the deployment began, showed that while inexperienced service members' psychological states largely stabilised at the reduced level recorded after 3 months, experienced service members' indicators continued to decline, reaching the lowest values in the last series.

Examples of research similar to ours are virtually absent in the scientific literature. We can mention only a longitudinal study carried out by Cigrang et al. (2014) of US Air Force se-

curity forces assigned to a year-long deployment to a war zone in Iraq, whose participants also showed deteriorated individual and interpersonal adjustment. We should also note that the very fact of being in a deployment zone can itself cause negative changes in service members' psychological states, which are not necessarily a consequence of combat experience. In particular, Kok et al. (2020) showed that, although the highest frequency of combat exposure was reported by operations (combat) units, the strongest negative changes of psychological states were displayed by force sustainment (non-combat) units of combat-deployed, active-duty enlisted US Army personnel.

We believe that our results give grounds to assert that both hypotheses have been confirmed. Regarding our first hypothesis (H1), the significant deterioration in Ukrainian service members' psychological states recorded after 3 months of deployment in a key front-line area in eastern Ukraine suggests that the maximum duration of such deployments should not exceed 3 months. There are two other arguments favouring this conclusion other than the above-described changes in psychological state. First, there was a sharp decline on key indicators (such as interest in deployment participation and the desire to perform service duties in the deployment area) during this period. Second, the intensity of combat stressors during the examined deployment was relatively lower than during previous deployments. Accordingly, we can expect more negative changes in psychological state if the intensity of such stressors increases.

The second hypothesis (H2) is, on the one hand, confirmed by the above-mentioned differences in the dynamics of Ukrainian military personnel's psychological states during deployment on the front lines in eastern Ukraine depending on their previous experience. On the other hand, given the significant deterioration of psychological states after 3 months of deployment in both samples, these differences do not affect the estimated recommended maximum duration of deployment.

Our results with regard to H2, as well as the determined differences in the dynamics of psychological state between the two samples of service members, are fully consistent with the data of other researchers. For example, according to Martínez-Sánchez (2019), the psychological adaptation of personnel deployed in military operations is facilitated by adequate and adjusted expectations about the mission (danger, role to perform, tasks and activities to be carried out, economic rewards and so on). Such expectations are, of course, more realistic among service members who have already participated in such deployments. On the other hand, as noted by Schmied et al. (2016) and Adrian et al. (2018), previous deployments can also increase the risk for a range of negative outcomes (e.g. somatic symptoms, depression, PTSD, sleep problems, anger reactions, substance abuse). Although we fully agree that combat veterans have a much higher survival rate than novices, despite their longer exposure time to combat (Stephenson, 2014), but our results show, first, the need for further research to determine the psychological dif-

ferences between experienced and inexperienced deployed service members, and second, the need to apply different approaches to them during psychological interventions.

Of course, the maximum deployment duration in a key front-line area in eastern Ukraine recommended on the basis of the obtained data is a quite generalised assumption. It is highly desirable to monitor service members' psychological states on a weekly basis during deployment in order to prevent negative consequences in terms of both service members' mental health and successful task performance by a military unit. This is fully consistent with Adrian et al. (2018) on the need to consider a deployment's impact well beyond the traditional deployment phases; Born and Zamorski (2018) on the need to consider meaningful impacts on mental health even in non-combat operations and even among personnel with low levels of exposure; and Martínez-Sánchez (2019) on the need to improve pre-mission psychophysical checks and to provide necessary training in resilience and stress management.

Conclusion

Although this study demonstrated significantly increased combat experience during 6 months of deployment in a key front-line area in eastern Ukraine for service members participating in deployment for the first time, only two of seven experience indicators became equal for previously experienced and inexperienced service members. This indicates that com-

bat stressors affecting Ukrainian service members in the examined deployment were less intense compared with other deployments.

The obtained results confirmed both hypotheses. Based on examinations of service members' psychological states, we determined a recommended deployment duration for Ukrainian military personnel on the front lines of eastern Ukraine, namely 3 months. While the dynamics of experienced and inexperienced service members' psychological states showed significant differences, this did not affect recommended deployment duration. It is also important that we substantiated the need to monitor service members' psychological states during deployment in order to timely prevent negative consequences for their mental health and their military unit's successful task performance.

The limitations of our study are determined by the specifics of the sample (Ukrainian service members) and the peculiarities of the tasks and conditions of their deployments in 2017 and 2018 in a key front-line area in eastern Ukraine. Despite these limitations, our findings show opportunities to determine deployment durations and prevent negative consequences for service members' mental health and performance based on examinations of their psychological states.

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Appendix A

Ukrainian adaptation of the Combat Exposure Scale.

No	Combat experience indicators				
1	Did you ever go on combat patrols or have other dangerous duty?				
	<i>Never</i>	<i>1–3 times</i>	<i>4–12 times</i>	<i>13–50 times</i>	<i>More than 50 times</i>
2	Were you ever under enemy fire?				
	<i>Never</i>	<i>Less than 1 month</i>	<i>1–3 months</i>	<i>4–6 months</i>	<i>More than 6 months</i>
3	Were you ever surrounded by the enemy?				
	<i>Never</i>	<i>1–2 times</i>	<i>3–12 times</i>	<i>13–50 times</i>	<i>More than 50 times</i>
4	What percent of the people in your unit were killed, wounded, or missing in action?				
	<i>None</i>	<i>1–25%</i>	<i>26–50%</i>	<i>51–75%</i>	<i>More than 75%</i>
5	How often did you fire rounds at the enemy?				
	<i>Never</i>	<i>1–2 times</i>	<i>3–12 times</i>	<i>13–50 times</i>	<i>More than 50 times</i>
6	How often did you see someone get hit by incoming or outgoing rounds?				
	<i>Never</i>	<i>1–2 times</i>	<i>3–12 times</i>	<i>13–50 times</i>	<i>More than 50 times</i>
7	How often were you in danger of being injured or killed (bullets, shells, melee weapons), ambushed or in other very dangerous situations in the line of duty?				
	<i>Never</i>	<i>1–2 times</i>	<i>3–12 times</i>	<i>13–50 times</i>	<i>More than 50 times</i>

Appendix B

Example form for Scaled Self-Assessment of Psycho-Physiological State with a respondent's estimates.

the worst	_____		the best
	<i>well-being</i>		
the lowest	_____		the highest
	<i>activity</i>		
the worse	_____		the best
	<i>mood</i>		
the lowest	_____		the highest
	<i>performance</i>		