



Well-being and Life Satisfaction of Strength Athletes During War: Role of Individual and Health-Related Determinants

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Abstract

The research aims to identify the determinants of well-being of youth strength athletes taking into account individual parameters (level of stress, anxiety, depression) and contextual parameters (change of place of residence, change of opportunity to train due to war), differences compared to an older age group. The online study was performed on elite strength athletes ($N=172$) in Ukraine during Russo-Ukrainian war. In addition to demographic characteristics, the survey included question to sports activity, issues related to hostilities, standardized questionnaires to measure life satisfaction (SWLS), perceived stress level (PSS-10), depression (PHQ-9), anxiety (GAD-7), physical, mental and social functioning (SF-36). Statistical analysis included descriptive statistics, correlation analysis to find association between variables, and building linear regression models. Samples of young and adult athletes that we analyzed did not differ in terms of life satisfaction. Among young athletes there were significantly fewer people with symptoms of stress (67%) and anxiety (25.53%). Three groups of factors that determine the life satisfaction of young Ukrainian athletes can be single out: individual (stress, depression), contextual (change of place of residence or training due to the war), and health-based (general perception of one's own health and pain sensations). The data highlight the critical importance of mental health monitoring for the overall well-being of athletes. The obtained results can be used to rapidly screen persons in the risk group during a war and further develop individual psychotherapeutic programs to overcome trauma and the consequences of war.

Keywords: life satisfaction, mental health, health-related quality of life, youth, powerlifting



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Introduction

Sports activity is a field of manifestation of human capabilities. It is characterized not only by the demonstration of muscle activity when performing physical exercises but also by

mastering the high technique of their performance and often by the maximum and even marginal physical and mental stress (Campbell et al., 2018; Pope et al., 2018). This sets special requirements for the health of the athlete; in fact, health is an inte-

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gral aspect of the athlete's life and directly affects his/her welfare. In general, sports can both positively and negatively influence various aspects of well-being (Malm et al., 2019). Athletic trainings improve the work of the athlete's cardiovascular, respiratory and neuromuscular systems (Jones & Carter, 2000). An indispensable condition for sports activities is the enthusiasm of the athlete, a steady interest in one of athletic discipline. Athletic activities are accompanied by a sense of growth, development, and improvement (Eime et al., 2013). In fact, a person creates himself/herself. He/she is judged by his/her performance at competitions and activities in sports. As a result of sports activities, athletes develop a number of psychological skills that help maintain a high level of motivation, high level of self-esteem, and resistance to failures that undoubtedly have a positive effect not only on athletic activity but also on other aspects of their lives (Dohme et al., 2019). Sports is characterized by social importance: establishing friendly contact with foreign athletes, developing patriotic and international feelings, and forming special sports values (Bessa et al., 2019). Organized sporting events create an environment in which athletes communicate, develop relationships and cooperation, and form a sense of involvement.

The coronavirus pandemic has caused significant restrictions that have influenced the level of physical activity in the world. During the pandemic, there was a reduction in the number of training days and hours, which led to the deterioration of the overall activity and physical performance of athletes (Mehrsafar et al., 2021; Pillay et al., 2020). Among the negative results of isolation are the following conditions: depression, fear, confusion, and anxiety. In addition to difficulties in training, athletes were not able to participate in competition, faced financial difficulties and suffered from the loss of goals and satisfaction.

Recent studies have shown that athletes are not less prone to mental illness than the population as a whole (Rice et al., 2016). This problem is quite acute, particularly among young athletes. During youth and adolescence period many mental health problems, such as depression, anxiety, eating disorders, abuse of psychoactive substances and suicides, begin to appear or exacerbate. Some specific sports characteristics may contribute to behavioral problems with health, such as lack of time for training, training with a physical injury or a prolonged recovery after it, overtraining, preparation for the transition "to the next level", bullying, sleep deprivation, change in interests or giving up of sports that is especially critical when sports is a part of the athlete's personality and the social circle (Xanthopoulos et al., 2020).

In recent years, Ukrainian athletes have faced a number of growing external challenges. Thus, during the coronavirus epidemic in Ukraine, restrictions of varying degrees were introduced. During the coronavirus epidemic and the extended period of quarantine restrictions, the Russian-Ukrainian War began in the territory of Ukraine on 24 February 2022. Ukrainians have become direct witnesses to the destruction of civilian infrastructure and mass killings of civilians in occupied territories. Prime Minister noted at the government meeting on February 7, 2023, that since the beginning of large-scale Russian aggression in Ukraine, more than 200 Ukrainian athletes and coaches were killed, more than 120 sports facilities were destroyed by enemy rockets and artillery, more than 300 sports schools ceased to exist, and more than 150,000 athletes do not have conditions for training (Speech of the Prime Minister of Ukraine Denys Shmyhal at the Government meeting | Cabinet of Ministers of Ukraine, n.d.). Many Ukrainian athletes went to the ranks of the

Armed Forces of Ukraine. All of these factors further exacerbate the existing difficulties of sports improvement.

Our research aimed to better understand the determinants of the well-being of strength athletes, considering parameters related to sports activity, individual parameters (level of stress, anxiety, depression), and context (change of residence, change of opportunity to train due to war, etc.). We analyzed life satisfaction as a cognitive part of well-being and the perception of well-being that is related to one's physical and mental capabilities. We take into account the importance of health for the athlete's well-being and focus attention on the physical and mental health that determine the athlete's ability to live a fulfilling life. We hypothesized that there would be a relationship between life satisfaction and the physical and mental components of well-being and assumed that the well-being of athletes of different ages and gender would differ. All these results are important from the point of view of practical application, as they allow us to outline the portrait of a athletes in war conditions and identify individuals who are at risk and, on the contrary, have a high level of resilience to adverse circumstances.

Materials and Methods

Procedure

The study was performed in Ukraine in 2022 (within a period from August 29 to September 18). On-line survey created with Google Forms and widespread among potential participants. The survey contained information about the purpose and objectives of the study, informed consent, sociodemographic questions, questions related to sports activity, issues related to hostilities, and standardized questionnaires concerning various aspects of well-being (stress level, depression, anxiety, satisfaction, physical health, level of physical, mental and social functioning).

The Bioethics Committee of Lviv State University of Physical Culture approved the study protocol (protocol number 11, 2022-12-09). The participants gave informed consent to participate in the study, and all measures were taken to ensure the anonymity of the participants.

Measurement

The assessment of the cognitive component of well-being was performed using the Satisfaction with Life Scale, which consists of five statements for evaluating the overall level of life satisfaction (Diener et al., 1985). The Ukrainian version of the questionnaire showed a high level of internal consistency in previous studies (Rogowska et al., 2021). The Cronbach's alpha for this set was 0.796.

Anxiety was evaluated by using the Generalized Anxiety Disorder (GAD-7) scale (Spitzer et al., 2006). The GAD-7 scale is intended for screening symptoms according to DSM-V criteria. A result above 10 points indicates anxiety disorder. The questionnaire has a sufficient level of internal consistency (Rogowska et al., 2020). For this set, the Cronbach's alpha was 0.914.

The Patient Health Questionnaire (PHQ-9) was used to evaluate the symptoms of depression (Kroenke et al., 2001). The questionnaire consists of nine statements that meet the DSM-IV diagnostic criteria. To diagnose the risk of major depressive disorders, a cutoff score of 10 or more is used. The questionnaire has a sufficient level of internal consistency (Rogowska et al., 2020), and the Cronbach's alpha for this sample was 0.817.

To estimate the level of stress, the Perceived Stress Scale (PSS-10) was used (Cohen et al., 1983). The questionnaire

consists of 10 statements that allow us to analyze how often some or other stressful events occurred and to what degree the person considers his/her life unpredictable, unmanaged and overloaded over the last month. The questionnaire has a high level of international consistency (Ochnik et al., 2021). The Cronbach's alpha for this sample was 0.861.

Health-related quality of life was measured using the 36-Item Short Form Health Survey (SF-36) (Ware & Sherbourne, 1992). Questions are grouped into 8 scales: physical functioning (PF), physical role functioning (RF), bodily pain (BP), vitality (VT), social functioning (SF), mental health (MH), emotional role functioning (RE), and general health (GH). Additionally, all the scales can be grouped into two components – Physical Component Score (PCS) and Mental Component Score (MCS). A score below 50 points for these components indicates a worse quality of life compared with average indicators of the total population.

Data about age, gender, place of residence (rural area, urban area), marital status, changes in the place of residence through the war were collected. Highly qualified athletes were

attributed to the winners of international competitions and/or Masters of Sports of Ukraine of the International Class (athletes can obtain this title only if they are participants of a national team at international competitions).

Participants

Sample N=172 people aged between 17 years and 79 years ($M=27.8$, $SD=9.45$) took part in the study. All participants were athletes in weightlifting or powerlifting of different levels. The overall set is dominated by persons who are engaged in powerlifting (79.1%), and participants represent all weight classes with a predominance of middle and heavy classes. The number of women in the total set amounted to 36.6%. The participants were divided into two groups with 25 years as cutoff criteria – young athletes ($N=94$, aged 21.3 years), and adult athletes ($N=78$, aged 35.7 years). With the exception of individual characteristics (age, relationship status, presence of children), the groups did not differ in socio-demographic data, as well as war-related variables. Detailed data on the sociodemographic characteristics of participants are provided in Table 1.

Table 1. Sociodemographic data and war-related variables

Variable	Youth (n=94)		Adults (n=78)		Total (n=172)		χ^2	p	ϕ
	N	%	N	%	N	%			
Gender							0.249	0.618	0.038
Men	58	33.7	51	29.7	109	63.4			
Women	36	20.9	27	15.7	63	36.6			
Relationship status							40.2	<.001	0.484
Single	80	46.5	30	17.4	110	64.0			
In a couple	14	8.1	48	27.9	62	36.0			
Children							66.3	<.001	0.621
Yes	2	1.2	45	26.2	47	27.3			
No	92	53.5	33	19.2	125	72.7			
Active hostilities in the area of residence							0.016	0.900	0.009
Yes	15	8.7	13	7.6	28	16.3			
No	79	45.9	65	37.8	144	83.7			
Change of place of residence and/or training due to hostilities							3.49	0.322	0.142
Yes	22	12.8	17	9.9	39	22.6			
No	72	41.9	61	35.4	133	77.3			
Qualification									
Highly qualified	64	37.2	65	37.8	129	75.0	5.29	0.021	0.173
Particularly high qualification	30	17.4	13	7.6	43	25.0			
Difficulties with training due to the war							2.38	0.123	0.118
Yes	72	41.9	67	39.0	139	80.8			
No	22	12.8	11	6.4	33	19.2			
Sport injuries							7.92	0.019	0.215
Yes	37	21.6	17	9.9	44	31.4			
No	57	33.1	61	35.5	118	68.6			

Statistical analysis

Analysis for continuous variables was conducted. The statistical analysis included descriptive statistics: mean (M), standard deviation (SD), and 95% confidence interval (CI) with lower limit (LL) and upper limit (UL). Data obtained on all scales were analyzed for normality. In the presence of a normal distribution,

to analyze the differences between different continuous variables, Student's t test was used to compare independent samples, and Cohen's d as the effect size was also taken into account. We utilized the Pearson χ^2 independence test for variables considered bivariate variables, and the effect size was assessed using the phi (ϕ) value. Multiple linear regression was used to examine the

relationship between well-being and predictors. All statistical analyses were conducted using JAMOVI software ver. 2.3.

Results

Pearson's χ^2 test of independence was performed on youth and adult samples in terms of perceived stress, anxiety, and depression symptoms, life satisfaction, and physical

and mental components of health-related quality of life. In the case of anxiety, depression, and life satisfaction, data were analyzed with cutoff criteria. The results are shown in Table 2. In the total sample, 73.3% of athletes had stress, 32.0% and 32.6% were at risk of anxiety and depression, respectively, and 54.7% and 77.9% had a low indicator of the physical or mental component of quality of life, respectively.

Table 2. Comparison of the youth sample with the adult sample in frequencies of life satisfaction, mental health variables, and health-related quality of life

Variable	Youth		Adults		Total		χ^2	p	ϕ
	N	%	N	%	N	%			
Life satisfaction									
Low	35	37.2	28	35.9	63	36.6		0.03	0.856
High	59	62.8	50	64.1	109	63.4			0.138
Perceived stress									
No symptoms	31	33.0	15	19.2	46	26.7		4.11	0.043
Stress symptoms	63	67.0	63	80.8	126	73.3			0.155
Anxiety									
No symptoms	70	74.5	47	60.3	117	68.0		3.96	0.047
Anxiety symptoms	24	25.5	31	39.7	55	32.0			0.152
Depression									
No symptoms	66	70.2	50	64.1	116	67.4		0.725	0.395
Depression symptoms	28	29.8	28	35.9	56	32.6			0.065
Physical component of life quality									
Worse quality of life	23	24.5	12	15.4	35	20.3		2.17	0.141
Better quality of life	71	75.5	66	84.6	137	79.7			0.112
Mental component of life quality									
Worse quality of life	67	71.3	67	85.9	134	77.9		5.29	0.021
Better quality of life	27	28.7	11	14.1	38	22.1			0.175

Young athletes did not differ from the set of adults in terms of life satisfaction, symptoms of depression and the physical component of health-related quality of life. Lower stress and

no anxiety risk was found among young athletes, while high stress, higher level of anxiety was more often reported in the adult sample. Similarly, young athletes had higher scores of

Table 3. Comparison of life satisfaction, mental health, and health-related quality of life of women and men

Variable	Women		Men		p	Effect Size
	Mean	SD	Mean	SD		
Life satisfaction	21.56	6.26	23.05	5.35	0.100	0.262
Perceived stress	22.06	7.20	16.71	6.92	<0.001	-0.763
Anxiety	9.83	5.47	5.89	4.60	<0.001	-0.798
Depression	10.48	5.53	7.38	4.42	<0.001	-0.639
Physical Component score	55.53	6.31	53.31	6.00	0.023	-0.364
PF	90.64	12.62	87.66	19.07	0.271	-0.175
RF	55.95	36.95	69.27	33.96	0.018	0.380
BP	69.81	23.34	75.65	22.20	0.105	0.258
GH	59.41	17.43	65.56	15.75	0.019	0.375
Mental component score	32.39	12.25	41.86	11.02	<0.001	0.825
VT	43.25	17.25	55.23	16.95	<0.001	0.702
SF	57.14	26.35	75.80	21.60	<0.001	0.796
RE	39.15	43.40	58.72	40.04	0.003	0.474
MH	46.92	18.26	60.95	19.16	<0.001	0.745

Note. PF: physical functioning; RF: physical role functioning; BP: bodily pain; GH: general health; VT: vitality; SF: social functioning; RE: emotional role functioning; MH: mental health

mental component of life quality.

Women showed significantly higher scores than men in perceived stress ($p<0.001$, $d=-0.763$), anxiety ($p<0.001$, $d=-0.798$), and depression ($p<0.001$, $d=-0.639$) (Table 3). The male and female samples did not differ in terms of life satisfaction. Women had significantly lower parameters of physical role functioning ($p=0.018$, $d=0.380$), general health ($p=0.019$, $d=0.375$), vitality ($p<0.001$, $d=0.702$), social functioning ($p<0.001$, $d=0.795$), and mental health ($p<0.001$, $d=0.745$).

Multiple linear regression was conducted to identify predictors of life satisfaction and physical and mental components of health-related quality of life for different age groups. The assumptions of regression were not acceptable, and the variance inflation factor for some predictors was higher than

4. Therefore, after additional analysis of the correlations between potential predictors and outcomes, some variables (for example, anxiety for adults) were excluded from the analysis. The assumption of regression for these modified cases was acceptable, including collinearity statistics ($VIF<4$), autocorrelation, no influential cases biasing the models of regression and multivariate normality. The results of the regression are shown in Table 4. Significant predictors of life satisfaction for youth athletes were gender, change of place of residence due to hostilities, stress, depression, bodily pain, and general health. The model can explain 54.4% of life satisfaction variance, $R=0.738$, $R^2=0.54$, $F(14, 79)=6.74$, $p<0.001$. Predictors of life satisfaction of adults were general health and emotional role functioning, and the model explained 26.1% of life satisfaction variance ($R=0.614$, $R^2=0.26$, $F(12, 65)=6.74$, $p<0.001$).

Table 4. Multiple linear regression for life satisfaction of athletes

Predictor	Youth				Adults			
	β	95% CI		p	β	95% CI		p
		LL	UL			LI	UI	
Gender	0.385	0.012	4.355	0.049	0.114	-0.338	0.567	0.616
Sport injuries	-0.302	-5.274	1.844	0.340	0.305	-1.507	2.116	0.738
Difficulties with training*	-0.098	-2.530	1.412	0.574	0.028	-0.426	0.483	0.901
Change of place of residence and/or training*	-0.547	-5.188	-1.030	0.004	-0.192	-0.657	0.273	0.413
Perceived stress	-0.289	-0.406	-0.026	0.027	0.045	-0.258	0.349	0.767
Anxiety	0.035	-0.292	0.368	0.820				
Depression	-0.269	-0.610	-0.007	0.045	-0.200	-0.477	0.077	0.154
PF	0.073	-0.044	0.098	0.456				
RF	0.138	0.0219	0.017	0.055				
BP	-0.257	-0.061	0.023	-0.015	-0.044	-0.275	0.186	0.702
GH	0.341	0.123	0.039	0.200	0.253	0.024	0.481	0.031
VT	0.016	0.005	0.034	0.073	0.096	-0.198	0.390	0.516
SF	-0.076	-0.017	0.027	0.036	0.104	-0.205	0.413	0.504
RE	-0.074	-0.010	0.017	0.023	0.269	0.007	0.531	0.044

Note. *due to hostilities; CI: confidence interval; LI: lower limit; UL: upper limit; PF: physical functioning; RF: physical role functioning; BP: bodily pain; GH: general health; VT: vitality; SF: social functioning; RE: emotional role functioning

Discussion

In sports psychology, scientists are increasingly seeking to operationalize and theoretically combine the spheres of well-being that characterize the experience of athletes (Dohme et al., 2019). In the case of athletes, various aspects of health are directly reflected in their well-being and are the cause of their poor well-being. According to our results, the majority of athletes had higher than average statistical parameters of the physical component of the quality of life related to health, which confirms high physical capabilities and the ability to cope with significant loads. It can be assumed that this tendency will persist as the athlete matures. However, in the case of the mental component, opposite conclusions can be obtained. Only 28.72% of participants have an index higher than the average for the population; among adult athletes, this parameter is two times lower. It should be emphasized that mental well-being aspects cannot be separated from physical health, as the symptoms of mental health and related systemic disorders increase the risk of physical trauma and delay recovery.

We did not find any difference between men and women in the case of life satisfaction. At the same time the difference

in parameters related to health, in particular physical role functioning, general health, vitality, social functioning, and emotional role functioning was quite significant. For social functioning and physical role functioning difference was more than 13 points, which cannot be fully explained only by gender influences. Women were distinguished by particularly low parameters of physical role functioning, vitality, emotional role functioning, and mental health. The only indicator that was at a high level in both groups was physical functioning (above 85 points), while physical role functioning, which characterizes the relationship between the performance of daily tasks and the respondent's physical condition, was below the average level. In our study, most of the health indicators of female athletes were at a low level or close to this level, indicating low vitality, severe fatigue, a decrease in the number of social contacts due to an unsatisfactory physical and emotional state, the presence of negative emotions and poor physical well-being that limits work capacity and daily activity.

Our research revealed differences between individual parameters of well-being (stress, anxiety) of different generations of athletes, but we did not find a statistically significant dif-

ference between life satisfaction of adults and young athletes. Among young athletes, there were significantly fewer people with symptoms of stress (67%) and anxiety (25.53%). It can be argued that negative phenomena related to mental health that was observed to a greater extent have their own prerequisites and are obviously cumulative in nature. The sample of athletes analyzed by us was in the territory where there were active military operations or shelling and bombing. At the same time, the war began during the coronavirus epidemic, which had a negative impact on the physical and mental health of professional athletes (Jurecka et al., 2021). Among the effects that were most commonly observed were a decrease in physical activity, an increase in time spent in a sitting position, increased negative emotions (stress, fatigue, anger, tension and depression) and deterioration of sleep quality, in particular among persons who took care of children or older family members (Xu et al., 2023).

Another factor that can cause a decrease in well-being is lack of security and protection. However, in the case of athletes who have suffered from the war, development occurs in a dangerous and uncertain environment (Michelini, 2018; Newnham et al., 2018). One of the factors affecting the life satisfaction of young Ukrainian athletes is a change of residence. It can have different effects; many people demonstrate considerable ingenuity, competence and self-efficacy in the face of difficulties (Xu et al., 2023), using different available supports and opportunities. However, a large part of the population has problems with mental health that adversely influence their well-being and physical health (Kien et al., 2019; Kurapov et al., 2022; Mesa-Vieira et al., 2022). Indicators of mental health in persons who suffered from the war and refugees differ significantly (Kien et al., 2019). However, despite the variability of prevalence estimates, records indicate that there is an increased level of psychological disorders and maladaptation among people affected by the war.

Limitations and directions for future research

This is the first study that concerns the mental state and well-being of highly qualified athletes during the Russo-Ukrainian war and allows us to deepen the understanding of athletes' resilience in an adverse environment. We identified predictors of high levels of well-being in athletes taking into account not only individual and war-related indicators but also parameters related to health. At the same time, the limitations of this study are the involvement of only strength athletes, the use of a relatively small dataset, the non-consideration of the level of war-related trauma or previous history of mental illness, reliance on linear relationships between potential predictors, and the dependent variable. This requires expanding the research to athletes of other specializations and using modeling methods to more accurately analyze the interactions of potential predictors of athletes' well-being and life satisfaction.

Conclusions

Our data reveal low indicators of mental health and at the same time their importance in general well-being and the essential connection between parameters of physical functioning and mental state. According to the results of our research, we can single out three groups of factors that will determine the life satisfaction of young Ukrainian athletes – these are factors at the individual level (stress, depression) and context-

tual factors (change of place of residence or training due to the war). Health indicators can be combined into a separate group of factors (general perception of one's own health and pain sensations). The obtained results can be used to rapidly screen persons in the risk group during a war and further develop individual psychotherapeutic programs to overcome trauma and the consequences of war.

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