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Anthropometric basis in women with infertility permanently residing in Central Ukraine according to the characteristics of the general adaptation syndrome under conditions of prolonged war

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Chronic psychoemotional and somatic stress under conditions of the prolonged war may influence neuroendocrine regulation in women, leading to changes in anthropometric characteristics and potentially affecting the course of infertility. At the same time, constitutional body features may modulate individual adaptive responses according to the concept of the general adaptation syndrome (GAS).

Aim – to evaluate anthropometric parameters in women with infertility who permanently resided in central Ukraine during the prolonged war from the perspective of the GAS concept.

Materials and methods. A prospective observational study was conducted involving 81 women of reproductive age diagnosed with infertility. The main group consisted of 50 women with infertility residing in central Ukraine since 2022, the control group – 31 women without fertility disorders (historical control). Somatotype (Heath–Carter method) and body composition components (Matiegka method) were assessed together with stress level (Holmes-Rahe Stress Scale), anxiety (Beck Anxiety Inventory). GAS phases were determined using the adaptation coefficient.

Results. The majority of women in the main group were in the resistance phase of GAS (66.0%), while the adaptation phase was observed in 30.0% and the exhaustion phase in 4.0%. Low stress-associated disease risk was found in 60.0%, moderate in 30.0%, high in 10.0%. Women with high risk had higher body mass, fat and bone components, endomorphy and lower body water percentage ($p<0.05$), as well as a significantly reduced muscle component compared with the control group (16.24±2.20 vs 20.81±1.99; $p<0.001$). Correlation analysis revealed moderate associations between anxiety scores and anthropometric parameters. No statistically significant differences were observed between GAS phases.

Conclusions. Body composition and somatotype may serve as morpho-constitutional markers of individual adaptive response to chronic psychoemotional stress. The predominance of the resistance phase indicates preserved adaptive reserves.

The study was conducted according to the principles of the Declaration of Helsinki. The Local Ethics Committee of the Perinatal Center approved the protocol of the study. The informed consent was obtained from the parents of newborns in order to conduct the study.

The authors declare no conflict of interest.

Keywords: infertility, anthropometry, body mass index, general adaptation syndrome, chronic stress, war.

Антропометричні параметри в жінок із безпліддям, які постійно проживають у Центральній Україні, за характеристиками загального адаптаційного синдрому в умовах тривалої війни

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Хронічний психоемоційний та соматичний стрес в умовах тривалої війни може впливати на нейроендокринну регуляцію у жінок, змінюючи антропометричні характеристики та потенційно впливаючи на перебіг безпліддя. Конституційні особливості тіла можуть модулювати індивідуальні адаптаційні реакції згідно з концепцією загального адаптаційного синдрому (general adaptation syndrome – GAS).

Мета – оцінити антропометричні параметри в жінок із безпліддям, які постійно проживають у центральній Україні під час тривалої війни, з позиції концепції GAS.

Матеріали та методи. Проведено проспективне обсерваційне дослідження за участю 81 жінки репродуктивного віку з діагнозом безпліддя. Основну групу склали 50 жінок із безпліддям, які проживають у центральній Україні з 2022 року, контрольну – 31 жінка без порушень фертильності (історичний контроль). Оцінювали соматотип за методом Хіт-Картера, компонентний склад тіла за Матейкою, рівень стресу за шкалою Холмса–Раге (Holmes and Rahe Stress Scale), тривожність за шкалою Бека (Beck Anxiety Inventory). Визначали фази GAS за адаптаційним коефіцієнтом.

Результати. Більшість (66,0%) жінок основної групи перебували у фазі резистентності GAS, фаза адаптації спостерігалась у 30,0%, фаза виснаження – у 4,0%. Низький ризик стрес-асоційованих захворювань мали 60,0%, помірний – 30,0%, високий – 10,0%. Жінки з високим ризиком мали вищу масу тіла, жировий та кістковий компоненти, ендоморфію та нижчий відсоток води ($p<0,05$), а також значно нижчий м'язовий компонент порівняно з контролем (16,24±2,20 проти 20,81±1,99; $p<0,001$). Кореляційний аналіз виявив помірні зв'язки між показниками тривожності та антропометричними параметрами. Статистично значущих відмінностей між фазами GAS не виявлено.

Висновки. Склад тіла та соматотип можуть бути морфоконституційними маркерами індивідуальної адаптаційної відповіді на хронічний психоемоційний стрес. Переважання фази резистентності свідчить про збереження адаптаційних резервів.

Дослідження виконано відповідно до принципів Гельсінської Декларації. На публікацію опису випадку була отримана інформована згода пацієнтки.

Автори заявляють про відсутність конфлікту інтересів.

Ключові слова: безпліддя, антропометрія, індекс маси тіла, загальний адаптаційний синдром, хронічний стрес, війна.

The relevance of the study is determined by the need to rethink the role of individual typological features of a woman's body under conditions of prolonged psychoemotional and somatic stress associated with war. Chronic stress exposure is accompanied by tension in the mechanisms of neuroendocrine regulation, activation of the hypothalamic-pituitary-adrenal axis, and changes in hormonal homeostasis, which directly affects the functioning of the reproductive system [8,20]. At the same time, modern data indicate that not only stress as an external factor determines the course of adaptation processes, but also the morpho-functional characteristics of a woman's body [14,21]. Anthropometric indicators and somatotypic features may reflect the individual adaptive reserve, the level of neuroendocrine reactivity, and the propensity for regulatory harmony. Specifically, somatotype and body structure potentially act as markers of variants of neuroendocrine and psychological adaptation, resistance, or, conversely, dysregulation under conditions of prolonged stress [2].

In the context of infertility, this becomes particularly important, as the features of stress-associated regulatory mechanisms caused by prolonged war can modify the clinical course, hormonal profile, and treatment effectiveness [10].

Thus, the study of the relationship between anthropometric and somatotypological characteristics of women of reproductive age and the features of their neuroendocrine and psychological adaptation under war conditions is scientifically justified and socially significant. It aims to deepen the understanding of the pathogenetic mechanisms of infertility under chronic stress and to form individualized approaches to diagnosis and treatment.

Aim – to determine the features of the anthropometric basis in women with infertility who permanently resided in central Ukraine under conditions of prolonged war stress within the spectrum of the general adaptation syndrome (GAS).

Materials and methods of the study

Prospective cohort study with comparison to a pre-war model.

The study included 81 women of reproductive age diagnosed with infertility, who were divided into two groups. The main group consisted of women with infertility who had permanently resided in central Ukraine since 2022, i.e., under conditions of prolonged wartime psychoemotional load.

Anthropometric studies were performed based on the principle of comparative analysis of two samples: the main group of women with infertility – 50 women, and the control group – 31 women without fertility disorders. Groups were formed considering age and anthropometric comparability (age, body weight, height), which ensured their morphometric homogeneity and minimized the influence of potential confounders. The control group was formed using data from the pre-war period, allowing it to be considered as a historical control.

This design allowed for the assessment of the association of anthropometric, somatotypological, and psychometric indicators with exposure to the prolonged wartime stress environment.

Study Limitations. The use of a pre-war control sample as a historical control may be accompanied by the influence of the time factor, including possible socio-economic changes, differences in access to medical care, modification of behavioral factors, and other uncontrolled variables. In this regard, the obtained results are interpreted as associative.

Anthropometric Studies. Genealogical and primary anthropometric indicators were recorded in a specially designed registration card: body weight and length, width of the distal epiphyses of the shoulder, forearm, thigh, and lower leg, 9 skinfold thicknesses, and 8 circumferential measurements. Based on these measurements, somatotyping was performed according to the Heath–Carter method [4], which allows determining the endomorphic (F), mesomorphic (M), and ectomorphic (L) components as integral characteristics of physique. The component composition of body mass (fat, muscle, and bone components) was calculated according to the method of J. Matiegka [5] with the determination of absolute and relative values.

Methods for determining stress states. To assess the level of stress load and psychoemotional state of women with infertility, a set of psychodiagnostic techniques was used, allowing assessment of both objective stressful events and subjective experience of anxiety. The examination was conducted individually in 50 patients of reproductive age with an established diagnosis of infertility. The level of objective stress load was determined using Holmes and Rahe Stress Scale (HRSS) (T.H. Holmes & R.H. Rahe, 1967) [7], which includes a list of 43 life events with corresponding stressfulness coefficients. Respondents noted events that occurred during the last 12 months, after which the total stress load score was calculated and the risk of stress-associated diseases was determined. The subjective level of anxiety was assessed using the Beck Anxiety Inventory (BAI)

[3], which contains 21 items and allows determining the intensity of somatic, cognitive, and affective symptoms of anxiety on a 4-point scale (A.T.Beck et al., 1988) [3].

For an integral assessment of the correspondence between objective stress load and subjective reaction to stress, the adaptation coefficient (AC) was calculated. Based on this indicator, the phase of the GAS was determined according to the concept of H. Selye (H. Selye, 1936) [17].

Statistical analysis. Statistical data processing was performed using licensed software AnalystSoft Inc., a statistical analysis program for macOS®. Version v8. Add-on: StatPlus Statistics+Analysis. Subscription: olehberestovoy@gmail.com: Premium. Content provider: AnalystSoft Inc.Group homogeneity was assessed using parametric methods of statistical analysis under the condition of normal distribution of indicators; no significant differences in basic anthropometric parameters were found between the groups ($p>0.05$). Statistical analysis was performed using standard parametric and non-parametric methods. Quantitative variables were expressed as the mean ± standard deviation (M±SD). The normality of distribution was assessed prior to inferential analysis. Differences between groups were evaluated using Student's t-test for independent samples. For comparisons involving more than two groups, analysis of variance (ANOVA) was applied, with the F-statistic reported.

Correlation analysis was performed to assess relationships between variables, and correlation coefficients (r) were calculated to determine the strength and direction of associations. The χ^2 (chi-square) test was used for the analysis of categorical variables. Degrees of freedom (df) were reported where appropriate for inferential statistical tests.

A p-value of less than 0.05 was considered statistically significant.

The study was conducted in accordance with the principles of the Declaration of Helsinki. The informed consent was obtained from the participants.

Results of the study and discussion

According to the results of frequency analysis of the disease risk indicator according to stress level, it was established that the majority of examined women belonged to the group with low risk – 30 (60.0%) persons. A moderate risk level was determined in 15 (30.0%) women, while a high risk was recorded only in 5 (10.0%) examined women. According to the results of the analysis of the phases of the GAS according to the interpretation by Hans Selye, it was established that the resistance phase dominated in the majority of examined women – 33 (66.0%) persons, while the adaptation phase was observed in 15 (30.0%) women, and the exhaustion phase – only in 2 (4.0%) cases. According to the results of the frequency analysis of anxiety level, it was found that in 21 (42.0%) examined women, the indicators corresponded to the norm. A low level of anxiety was found in 8 (16.0%) persons, a moderate level – in 14 (28.0%), while a high level of anxiety was determined in 7 (14.0%) women. The obtained data indicate that the majority of examined women had normal or moderate anxiety levels, while a high level of anxiety was observed in a relatively small proportion of the study sample.

Analysis of the combination of disease risk level according to stress level, anxiety level, and phases of the GAS according to H. Selye [17] showed that in the low-risk group (n=30), the resistance phase was most often observed (18 cases), while the adaptation phase was determined in 10 persons, and the exhaustion phase in 2 cases. In the moderate-risk group (n=15), the resistance phase also prevailed (13 cases), while the adaptation phase was found only in 2 women, and no cases of the exhaustion phase were recorded. In the high-risk group (n=5), the adaptation phase dominated (3 cases), while the resistance phase was observed in 2 women, and the exhaustion phase was not detected. Overall, in the study sample, the resistance phase was the most common (33 cases), while the adaptation phase was observed in 15 women, and the exhaustion phase only in 2 cases, indicating a predominance of a stabilized adaptive response of the body to stressful influences.

The conducted χ^2-analysis of the distribution of GAS phases depending on the disease risk level according to the HRSS showed that in the groups with low and moderate risk, the resistance phase dominated (60.0% and 86.7%, respectively). In the group with a high risk level, a relative increase in the proportion of the adaptation phase was observed. The exhaustion phase was found only in isolated cases in the low-risk group.

According to the results of analysis of variance, a statistically significant influence of the height indicator on the disease risk level according to the HRSS was established ($F=5.15$; $p=0.023$). A statistically significant relationship

Table 1

Student's t-tests: Anthropometric and somatotypological characteristics of women in the control and main groups (M±SD)

Variable	Control group (n=31), M±SD	Main group (n=50), M±SD	t-test	F (equality of variances)	p
Age, years	38.06±3.614	37.94±4.905	0.12	1.84	0.904
Body mass, kg	69.05±10.950	64.56±10.793	1.84	1.03	0.069
Height, cm	164.70±4.838	164.66±14.382	0.01	8.84	0.989
Body surface area, m²	1.74±0.134	1.69±0.189	1.19	1.99	0.237
Fat component, kg	16.40±6.448	19.93±7.957	-2.13	1.52	**0.036**
Fat Component, %	23.26±5.961	30.01±8.408	-3.99	1.99	**<0.001**
Water, %	56.17±4.364	51.23±6.155	3.99	1.99	**<0.001**
Muscle component,kg	20.81±1.994	16.24±2.199	9.61	1.22	**<0.001**
Bone Component, kg	9.48±1.317	10.42±1.920	-2.45	2.13	**0.016**
Endomorphy, score	5.13±1.394	5.93±1.556	-2.40	1.25	**0.019**
Mesomorphy, score	5.34±1.933	6.10±2.554	-1.44	1.75	0.153
Ectomorphy, score	0.95±1.505	1.63±2.965	-1.22	3.88	0.227

Note: Control group – 31 women without infertility (pre-war period); Main group – 50 women with infertility (wartime period).

was also found between the stress risk level and the ectomorphy indicator (F=4.27; p=0.037).

Statistically significant differences were established for indicators of body water percentage (F=3.23; p=0.048) and bone component (F=3.75; p=0.031). For other indicators – body weight, height, body surface area, fat and muscle components, as well as somatotypological parameters (endomorphy, mesomorphy, and ectomorphy) – no statistically significant differences were found between the risk groups (p>0.05).

Women in the main group had a significantly higher fat component, bone component, and endomorphy, lower water percentage, and lower muscle component (Table 1).

The results of correlation analysis (Table 2) showed that BAI scores had a moderate inverse correlation with water amount (R=-0.49), a moderate correlation (R=0.37) with the muscle component and ectomorphy (R=0.47), and moderate inverse correlations with endomorphy and mesomorphy (R=-0.49 and R=-0.48, respectively).

In the course of statistical analysis using Student's t-test for independent samples (grouping by the indicator «Disease risk according to stress level»: control group – low risk, main group – moderate risk), a comparison of the studied anthropometric data was conducted: no significant differences were found between the groups (p>0.05).

Comparative analysis (using Student's t-test) established statistically significant differences in a number of anthropometric and somatotypological characteristics. Body weight in patients with high risk was significantly higher compared to the low-risk group (73.40 kg vs. 64.70 kg; t=-1.82; df=33; p<0.05). The fat component was also statistically significantly higher in the high-risk group (26.37 vs. 18.95; t=-2.22; df=33; p=0.033), indicating a more pronounced adipose component of the body in patients with increased stress load. The percentage of water was significantly lower in women with a high risk level (47.29% vs. 52.14%; t=1.88; df=33; p<0.05), reflecting changes in the component composition of the body towards a decrease in the hydration component. The bone component in the high-risk group was statistically significantly higher (12.16 vs. 10.52; t=-2.05; df=33; p=0.048), indicating the presence of morpho-constitutional differences between the studied groups. The en-

Table 2

Correlation between Beck Anxiety Inventory (BAI) scores and body composition parameters

Parameter	Correlation coefficient (R)	Direction of correlation	Strength of correlation	p-value
Water amount	-0.49	Inverse	Moderate	<0.01
Muscle component	0.37	Positive	Moderate	<0.01
Ectomorphy	0.47	Positive	Moderate	<0.01
Endomorphy	-0.49	Inverse	Moderate	<0.01
Mesomorphy	-0.48	Inverse	Moderate	<0.01

domorphy indicator was significantly higher in patients with a high risk level (6.95 vs. 5.68; t=-1.87; df=33; p<0.05), indicating a predominance of the fat component of the somatotype in this category of examined women. It was found that the resistance phase, according to Selye, predominated in the sample (66%), while the exhaustion phase occurred only sporadically (4%). The distribution of phases differed depending on the level of stress-associated disease risk: in the low and moderate-risk groups, resistance dominated, while in the high-risk group, a relative increase in the proportion of the adaptation phase was noted. Morpho-constitutional differences at high risk included an increase in fat and bone components and a decrease in the hydration indicator, as well as a pronounced decrease in the muscle component (16.24±2.20 vs. 20.81±1.99; p<0.001), reflecting a specific component «price» of chronic adaptation to stress.

Discussion

The obtained data from the analysis of stress states indicate that the majority of the examined women are in a state of stabilized adaptive response of the body to prolonged stressful influences caused by events related to the years of war in Ukraine. The similarity of the model is described in the literature. A high level of stress in Ukrainian women has been shown, but at the same time, analysis of resilience and self-efficacy demonstrates the presence of adaptive resources and different «modes» of response to prolonged war stress [15].

Other authors identify groups with higher resilience and protective factors that demonstrate a more stabilized adaptive response despite prolonged exposure to war conditions [11]. In another study on a sample of Ukrainian master's students, it was shown that the content of the structure of adaptive capacity to stress changes at different stages of the war; at all stages, the «adaptive core» was somatic regulation, which is interpreted as a relatively stabilized adaptive response to prolonged stress [9]. A literature review provides data from sociological surveys: a significant part of respondents is in a state of increased anxiety, but groups are identified that demonstrate a more stabilized adaptive response due to resources, coping strategies, and social support [22]. Our obtained results of anthropometric studies allow us to consider somatotypological and component characteristics of the body as morpho-constitutional markers of the variability of psychoemotional and adaptive response under conditions of chronic wartime stress load.

A similar approach led the authors to conclude that endomorphy strongly positively correlates with levels of depression, anxiety, and stress, while ectomorphy correlates negatively; endomorphy is an independent predictor of psychological distress after adjustment for BMI and other body composition parameters. They demonstrate statistically significant correlations between somatotype components (endomorphy, mesomorphy, ectomorphy) and indicators of depression, anxiety, and stress, which allows interpreting somatotype as an integral morphological marker of psychoemotional vulnerability [6].

In another work by I.I.Andriievskyi [2], it was shown that in women of different somatotypes, levels of anxiety, neuroticism, character accentuations, and types of extraversion/introversion differ; the authors interpret somatotype as a constitutional basis of psychoemotional features [1].

The inverse correlation we found between the fat component and the level of anxiety is consistent with the data from the dissertation work of I.I.Andriievskyi, who showed that anthropo-somatotypological characteristics can modulate personal properties, particularly the level of anxiety and neuroticism in practically healthy women [2] and emphasizes that the bone component in representatives of the intermediate somatotype had a pronounced inverse relationship with anxiety indicators (r≈-0.64...-0.68), which allows considering skeletal massiveness as a potential constitutional buffer of psychoemotional lability. At the same time, in our study, comparison of groups according to the level of disease risk according to the stress scale demonstrated a fundamentally different picture: only upon transition from low to high disease risk in the main group were statistically significant morpho-constitutional differences revealed. Thus, if within the correlation analysis the fat component had an inverse relationship with anxiety, then in the group comparison, it was the high integral stress risk that was associated with a more pronounced endomorphic profile, and the increase in the fat component under conditions of prolonged stress can be considered as a metabolic adaptive reaction, while the decrease in water percentage reflects a change in the component balance of the body.

Such ambivalence may reflect different levels of analysis: individual-psychological (correlational) and population-constitutional (group). From the perspective of Hans Selye's concept of the GAS, chronic distress is accompanied by prolonged activation of the hypothalamic-pituitary-adrenal axis with subsequent metabolic shifts [19].

Our results of analysis of variance indicate the presence of significant differences in the ectomorphic component of the somatotype between groups of women with different levels of disease risk according to the HRSS, which points to a possible connection between constitutional features of the body and the variability of the realization of stress-associated risk. To a certain extent, these results resonate with the conducted analysis of classifications of constitutional types with an emphasis on their sensitivity to somatic, mental, and stress disorders; an approach is substantiated in which constitution (including somatotype) acts as a marker of predisposition to a certain variant of adaptive response under chronic stress [12].

The fact of a decrease in the muscle component remains interesting. Our results partially agree with the literature data. Thus, P.H.A.Silva et al. (2024) demonstrated that excess body weight and abdominal obesity are associated with higher rates of anxiety and depression in women [18], and C. Qin and W. Gai (2025) proved a possible causal role of circulating metabolites in mediating the relationship between obesity and anxiety disorders, which confirms the biological basis of the interaction of somatic and psychoemotional components [16]. In turn, in a conceptual review, somatotype is described as a quantitative indicator of body shape, reflecting integrated morphological and functional features of the organism, including metabolic and hormonal characteristics, against which individual variants of adaptation are formed [13].

At the same time, in the sample of practically healthy women by I.I. Andriievskyi (2025), the bone component was not considered as an independent predictor of anxiety disorders but was interpreted as a marker of somatotype [2]. Whereas in our study, when comparing the phases of stress response according to the interpretation by Selye (resistance phase and adaptation phase) [17], no statistically significant anthropometric differences were found ($p>0.05$). This indicates that morphological restructuring of the body does not necessarily correlate with the formally defined phase of the adaptation process, while the integral level of stress risk is a more sensitive indicator of constitutional changes.

It should also be considered that, according to Ukrainian studies on the consequences of war stress for women's health [8,20], chronic psychoemotional tension is accompanied by neuroendocrine dysregulation, which can affect metabolic processes and body composition. Thus, somatotypological features may act not only as a morphometric characteristic but also as a reflection of deep neuroendocrine mechanisms of adaptation. Consequently, constitutional features acquire more pronounced prognostic significance precisely under conditions of chronic stress load, which corresponds to the resistance phase or the transition to exhaustion according to the concept of the GAS.

Conclusions

The obtained results allow considering body composition and somatotypological characteristics as potential morpho-constitutional markers of individual adaptive reactions of the female body in response to prolonged psychoemotional stress during wartime. The predominance of the resistance phase at different levels of stress risk may indicate the formation of a chronic adaptive state of the body under conditions of prolonged psychoemotional load during wartime. The absence of a mass transition to the exhaustion phase indicates the preservation of adaptive reserves in the majority of the examined women.

Prospects for further research. Investigation of the relationship between anthropometric changes and indicators of cortisol, prolactin, and markers of metabolic syndrome under conditions of chronic war stress.

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References/Література

1. Andriievskyi II. (2021). Evaluation of the leading typological characteristics of temperament, severity and features of accentuated personality traits and psychodynamic features of personality in practically healthy women taking into account the somatotype. Rep Vinnytsia Natl Med Univ. 25(3). doi: 10.31393/reports-vnmedical-2021-25(3)-08.
2. Andriievskyi II. (2025). Peculiarities of correlation between indicators of personality traits of practically healthy women and anthropo-somatotypological characteristics of their body. Dissertation for obtaining the degree of Doctor of Philosophy in Medicine. Vinnytsia: National Pirogov Memorial Medical University.
3. Beck AT, Brown G, Epstein N, Steer RA. (1988). An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol. 56(6): 893-897. doi: 10.1037/0022-006X.56.6.893.
4. Carter JEL. (2002).The Heath-Carter anthropometric somatotype: instruction manual.San Diego (CA): Department of Exercise and Nutritional Sciences, San Diego State University.
5. Cattrysse E, Zinzen E, Caboor D, Duquet W, Van Roy P, Clarys JP. (2002). Anthropometric fractionation of body mass: Matiegka revisited. J Sports Sci. 20(9): 717-723. doi: 10.1080/026404102320219428.
6. Geller S, Levy S, Avitsur R. (2025). Body image, illness perception, and psychological distress in women coping with polycystic ovary syndrome (PCOS). Health Psychol Open. 12: 20551029251327441. doi: 10.1177/20551029251327441.
7. Holmes TH, Rahe RH. (1967). The social readjustment rating scale. J Psychosom Res. 11(2): 213-218. doi: 10.1016/0022-3999(67)90010-4.
8. Horbatiuk OH, Shatkovska AS, Hryhorenko AP, Vaskiv OV, Bets IO, Kustovska IM et al. (2019). Features of women's reproductive dysfunctions associated with prolonged stressful situations.Zaporozhye Med J. 21(6): 764-769. doi: 10.14739/2310-1210.2019.6.186501.
9. Hrabovska S, Partyko T, Stelmashchuk Kh. (2024). Adaptability to stress in student youth at different stages of the Russian-Ukrainian military conflict.Insight Psychol Dimens Soc. 12: 115-136. doi: 10.32999/2663-970X/2024-12-8.
10. Hu Y, Wang W, Ma W, Wang W, Ren W, Wang S et al. (2025, Feb). Impact of psychological stress on ovarian function: insights, mechanisms and intervention strategies. (Review). Int J Mol Med. 55(2): 34. Epub 2024 Dec 20. doi: 10.3892/ijmm.2024.5475. PMID: 39704226; PMCID: PMC11670866.
11. Kimhi S, Eshel Y, Marciano H, Adini B. (2023). Impact of the war in Ukraine on resilience, protective, and vulnerability factors. Front Public Health. 11: 1053940. doi: 10.3389/fpubh.2023.1053940.
12. Kobzar TA, Kryachok TV, Semikhova OS. (2023). Information-structural model of the formation of stress-induced somatic disorders in constitutional types.Cybern Syst Anal.4:64. doi:10.15407/csc.2023.04.064.
13. Padilla CJ, Ferreyro FA, Arnold WD. (2021). Anthropometry as a readily accessible health assessment of older adults.Exp Gerontol.153:111464. doi:10.1016/j.exger.2021.111464.
14. Palumbo MC, Dominguez S, Dong H. (2020). Sex differences in hypothalamic-pituitary-adrenal axis regulation after chronic unpredictable stress.Brain Behav. 10(4): e01586. doi: 10.1002/brb3.1586.
15. Piotrowski A, Boe O, Sygit-Kowalkowska E, Petrovska I, Predoiu A, Predoiu R et al. (2023). Women during the war - stress, resilience and self-efficacy during the Russian-Ukrainian war among women from Ukraine, Poland, Slovakia and Romania. Eur Psychiatry. 66; Suppl 1: S649. doi: 10.1192/j.eurpsy.2023.1350.
16. Qin C, Gai W. (2025). A causal inference study of circulating metabolites mediating the effect of obesity-related indicators on the incidence of anxiety disorders.Brain Behav.15(7):e70653. doi:10.1002/brb3.70653.
17. Selye H. (1998). A syndrome produced by diverse nocuousagents. 1936. J Neuropsychiatry Clin Neurosci. 10(2): 230-231. doi: 10.1176/jnp.10.2.230a. PMID: 9722327.
18. Silva PHA, Oliveira-Silva I, Cosme ASM, Borges AR, Soares V. (2024). Obesity indices, cardiorespiratory fitness and mental health in obese and non-obese women: a cross-sectional study.Int J Womens Health Wellness.10:159. doi:10.23937/2474-1353/1510159.
19. Szabo S, Szabo K, Zayachkivska O.(2019). Stress: From Hans Selye to today.Lviv: Danylo Halytsky Lviv National Medical University; Shevchenko Scientific Society:120.
20. Tatarchuk T, Yefimenko O, Myronenko O, Mnevets R. (2024). Consequences of wartime stress on women's reproductive health. Reprod Endocrinol. 72: 28-34. doi: 10.18370/2309-4117.2024.72.28-34.
21. Verma R, Balhara YPS, Gupta CS. (2011). Gender differences in stress response: role of developmental and biological determinants. Ind Psychiatry J. 20(1): 4-10. doi: 10.4103/0972-6748.98407.
22. Vus VI, Shkoliar MV, Proskuriakov S, Fradelos E. (2024). Maintaining the mental health of Ukrainians in time of war: searching for a mechanism to provide a comprehensive system of psychosocial support and mental health awareness. Pol Merkur Lek. 52(3): 373-379. doi: 10.36740/Merkur202403116.

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