Results of a follow-up survey on "Russian-Ukrainian war, climate change, Covid-19, and economic worries in relation to current stress symptoms in the general public in Germany."

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Short Report

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Abstract

Population stressors, such as the Covid 19 pandemic, climate change, the Russian-Ukrainian war, or a tense economic situation, are putting a strain on the well-being and mental health of Western populations. To examine the impact of such stressors, our group has recently published a study on the impact of current crises on subclinical stress symptoms in the German population. This short communication utilizes data from the latest second wave of this study. It evaluates, as to whether the results from the first study are still valid for the current and rapid changes in these population stressors. As in the first wave, the Russian-Ukrainian war was still rated as the most worrisome. However, the burden of the Covid 19 pandemic remains the most important predictor for subclinical stress symptoms.

Background

European countries are currently confronted with various crises, some of which require massive individual and societal adaptations: the Covid 19 pandemic, the Russian-Ukrainian war, climate change, and an economic burden. Each of these stressors is associated with negative consequences for mental health [1–3]. In a recent study conducted in a representative German sample in spring 2022, our group disentangled the impact of current population stressors on subclinical stress symptoms [4]. However, with the latest progression of the Russian-Ukrainian war and increasing economic challenges, the nature of these stressors has shifted. This raises the question as to whether the obtained results are still valid for a changing environment. This research note focuses on a replication with follow up data from a second wave conducted in November 2022.

In the initial wave, Weierstall-Pust and colleagues (2022) tested a multi-dimensional model for the prediction of subclinical stress symptoms in a German population as one example for a Western European country currently affected by global crises. It aimed to disentangle the impact of stressors related to the Covid 19 pandemic, Russian-Ukrainian war, and climate change on current stress symptoms. It was shown that the perceived threat of a stressor does not necessarily predict actual stress symptoms: A few weeks after the outbreak of the war in Ukraine, the Russian-Ukrainian war stressor was rated as the most worrisome among the three stressor groups. However, the Covid 19 pandemic predicted the actual stress symptoms best, although this stressor group was rated the least worrisome.

It is well established that stress is one of the most important factors influencing mental and physical health and is a nonspecific etiological risk factor for many diseases [5–7]. The measurement of subclinical stress levels provides a promising and global marker for the worsening of an individual’s mental and physical health that may mark the starting point of a potentially progressive development of chronic and clinically significant ill-health.

Using data from November 2022, we (1) compared the extent of exposure to the four latest and most prominent population stressors and (2) evaluated how the stressors relate to current subclinical stress
symptomatology, resorting to the research methods that have already been successfully implemented in our first study.

**Methods**

The general research methodology remained unchanged: Representative data was collected online in November 2022 by the Kantar institute. 3128 datasets were included; (female = 1676; diverse = 15); age: \( M = 51.7 \) years; \( SD = 17.1 \). Individuals with diverse gender identities were randomly assigned to the groups of females or males. Cross-quota sampling was considered (gender, state (Bundesland), and income). Inclusion criteria were: \( \geq 18 \) years, German-language fluency, and written informed consent. Participation was compensated. The ethics committee of the Medical School Hamburg approved the study.

To address current changes in the significance of population stressors in the general public, the validated stressor list from the initial survey \([4]\) was adapted: Some stressors related to the Russian-Ukrainian war (such as the threat of a nuclear war) were adapted according to the progression of the war. Additionally, stressors capturing worries related to current economic situation were added. The refined stressor list covered 34 items (climate change: 8 items; covid-19 pandemic: 12 items; war: 7 items, economy: 7 items). A four-factor exploratory structural equation model confirmed the validity of the adapted scale.

The sum score of the *Subclinical Stress Questionnaire* (SSQ-25) \([8]\), served as the central measure of current subclinical stress.

Descriptive sample characteristics and product-moment correlations between variables were calculated. For comparison of the subjective burden by stressor groups, repeated measures analysis of variance was calculated on within-person ranks. Pairwise comparisons were calculated using Bonferroni-corrected \( t \)-tests for dependent samples. For prediction of stress symptoms by stressor groups, multiple linear regression analysis (backward elimination) was calculated with the sum score of the SSQ-25 as the dependent variable and the predictors age, sex, and all four stressor groups. All two-way interactions between the factors gender and age with the four stressor groups were added to account for potential moderator effects. Gender was dummy coded. To reduce multicollinearity, all predictor variables in the interactions were mean-centered. The significance level was set to \( \alpha = .05 \). Analysis was performed using SPSS 28, AMOS, and R.

**Results**

**Comparison of burdens between stressor groups.**

Figure 1 shows the comparison of the mean ranks between stressor groups (\( F(3,9381) = 354.20, p < .001, \eta^2 = .10 \)): The war in Ukraine was rated as the most burdensome stressor, followed by the economic and climate change stressors. The Covid-19 stressors were rated least burdensome. Except for the comparison between climate change stressors and economic stressors (\( p = .220 \)), all pairwise
Prediction of subclinical stress load

Table 1 (see supplemental section below) shows the full as well as the final model for the prediction of subclinical stress load (SSQ-25). The final model explained 43% of the total variance ($F(7,3120) = 339.10$, $p < .001$), corresponding to a large effect ($f^2 = 0.75$).

Gender, age, as well as the three stressor groups Covid 19 pandemic, economic worries, and climate change were statistically significant main effects. This means that women as well as younger participants reported a generally higher burden of stress symptoms. The Russian-Ukrainian war was excluded from the final model because it did not show a statistically significant effect when its prediction was controlled for the other stressor groups. The significant interactions imply that 1) in men, economic worries contribute less to stress symptoms, and 2) that Covid-19 pandemic stressors are associated with fewer stress symptoms in older individuals. The main effect of Covid-19 pandemic stressors had the largest effect size.

Discussion

Although the Russian-Ukrainian-war has progressed and the economic situation in different branches has worsened, the results of this study show a similar pattern to the ones obtained in early 2022: When subjectively assessing current burden of population stressors, Covid-19 stressors scored the lowest. However, the pandemic situation, as an influencing factor for the population's stress symptoms, may still not be neglected: Worries due to Covid-19 pandemic continued to have the highest predictive value for the existence of subclinical stress symptoms compared to all other stressor groups.

Stressors due to the Russian-Ukrainian war were rated the most worrisome on a subjective level but have negligible predictive value for the occurrence of stress symptoms. This result is consistent with findings from spring 2022 [4]. However, longer-term effects of this stressor have not yet been detected. It is therefore even more important to investigate the development of subclinical stress symptoms in the population in relation to various stressors by means of longitudinal data.

Taken together, it seems to be relevant which kind of stressor becomes a risk factor for the impairment of a population's health: The two groups of stressors that were found to be the best predictors for the expression of stress symptoms both have concrete links to the lives of the individuals concerned [9]. During the Covid 19 pandemic, many people's lifestyles were fundamentally altered – similarly for people with economic concerns. The effects of economic stress will manifest themselves in everyday life sooner than the immediate consequences of the Russian-Ukrainian war or climate change, which are even more abstract threats in Germany now.

Limitations
Furthermore, all variables were collected cross-sectionally. Therefore, the prediction of stress symptomatology by the stressors should be considered correlational and not causal. The assessment of stress symptoms is also based on self-assessments by the participants.

**Declarations**

**Ethics approval and consent to participate**

The Ethics Committee of the Medical School Hamburg provided ethical clearance, confirming that all methods were performed in accordance with the Declaration of Helsinki. All participants gave written informed consent to participate in the study and received financial compensation.

**Consent for publication**

Not applicable

**Availability of data and materials**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Competing interests**

The authors declare that they have no competing interests.

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Anna Plate and Lisa Arnhold shared first authorship.

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Contributions

LA, AP, MS, PH, TS, MJM & RWP jointly developed the study design, reviewed the literature and wrote the article. RWP and AP performed the statistical analyses. The study is part of a representative survey whose design was conducted by RWP, PH, AP, TS & MJM. The implementation of the study was coordinated by RWP. All authors read and approved the final manuscript.

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References


Figures
Figure 1

Mean ranks and interquartile ranges for the four stressor groups.

Note. Asterisks indicate statistically significant pairwise comparisons on a p < .001 – level. A lower rank (closer to 1) indicates a higher stress burden.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Table1.docx