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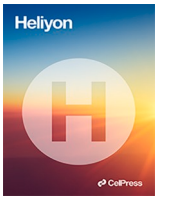

Mental health and stress level of Ukrainians seeking psychological help online

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A B S T R A C T

Due to the Russian invasion of Ukraine on February 24th, 2022, more than 8 million Ukrainians have been displaced from their homes. Ukrainians exposed to armed conflict and migration are likely to have low levels of mental health status and seek help. We provide a uniform quantitative assessment of the mental health conditions of Ukrainians seeking help soon after the invasion and resettlement. We screen the mental well-being and psychological distress of 1165 refugees, migrants, internally displaced, and non-displaced individuals from Ukraine who seek psychological help online in Ukraine and across 24 countries of the European Union. We surveyed participants in the study as a part of our online program for adult Ukrainians from June 22nd to July 6th, 2022. We report descriptive results of mental-health status for the aggregate sample and the sub-groups. More than half of the respondents exhibit low levels of mental well-being and high psychological distress, with 81 % being at risk of depression; 57 % having severe psychological distress. Refugees and internally displaced participants show a particularly high risk of depression and severe psychological distress in our sample. Many Ukrainians seeking psychological help work, study, or volunteer, and those who engage in these activities have relatively alleviated mental well-being. Our results indicate a considerable psychological burden on Ukrainians. Although our analysis focuses on Ukrainians seeking help, it shows that the displaced soon after resettlement require particular attention and can be reached in a short time across borders, irrespective of their (officially documented) migration status.

1. Introduction

Due to the invasion of Ukraine, more than 8 million Ukrainians had to leave their home country, and more than 5.3 million Ukrainians remain internally displaced [1], giving rise to "the largest human displacement crisis in the world today" [2]. Moreover, these mass movements of people drastically differ from those previously experienced in Europe since it is relatively free to move across borders [3], posing a challenge for rapid (mental) health needs assessment and quick (mental) health assistance [4–7]. Robust quantitative analysis is needed to understand the (mental) health conditions of this conflict-affected population [4]. The need for a uniform assessment is particularly pressing given that the Ukrainian mental health situation was a blind spot even before the invasion [8,9], with only a few studies providing estimates of mental health status among the conflict-affected population before the current conflict in Ukraine [10–13].

Before the current conflict, studies on the mental health status of conflict-affected Ukrainians focused on the population within Ukraine. In 2016, an assessment of older persons (>60 years) showed a high prevalence of serious psychological distress in the conflict-affected Donbas regions of Ukraine [11], and a survey of internally displaced adults (>18 years) across Ukraine (excluding the Donbas regions) indicated a high burden of mental disorders among them [12]. Moreover, a survey of the (officially) registered internally displaced in Ukraine (excluding the Donbas regions) and non-displaced adults (≥30 years) in the Donbas region provided a comparison of mental health status among these groups in 2018 [10]. This survey showed that a higher proportion of the officially registered

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internally displaced reported serious psychological distress than non-displaced adults.

Several commentaries have called for attention to the mental health of Ukrainians after the invasion anticipating substantial mental health risks for the internally displaced and a spike in the number of refugees [14–21]. They urge adopting a system to assess and meet the (mental) health needs of displaced people fleeing Ukraine, the internally displaced, civilian combatants, and the general Ukrainian population. Mental health assessment is particularly pressing for people who had to leave their home or home country due to fear of war, violence, or prosecution [22]. Migration stressors can promote psychological distress and disorders [22]. Refugees and those internally displaced can also experience non-specific symptoms of stress, depression, and anxiety (feeling nervous, restless or fidgety, hopeless, worthless, etc.) [10,11], indicating common mental disorders like depression and anxiety disorders [23,24]. Indeed, meta-analyses show that the prevalence rates of depression and anxiety are almost twice as high among refugees as among labor migrants [25] and that forced migration is associated with long-term mental health problems, e.g. post-traumatic stress disorder (PTSD), anxiety disorders, and depression [26]. Results of a recent meta-analysis of the mental health of forced migrants (refugees and internally displaced individuals) further attest to the urgency of assessing mental health needs, especially right after resettlement [27].

To date, the United Nations High Commissioner for Refugees supplies a survey of the profile and intentions of Ukrainian refugees in six European Union countries [3], and an online survey provides estimates of the labor market prospects of Ukrainian refugees in Germany [28], and a preliminary survey of Ukrainian refugees in Germany shows that female participants suffer higher psychological distress, depressive symptoms, and anxiety, which is associated with decreased quality of life [29]. In addition, the evaluations of the psychometric properties of the War Anxiety Scale among Ukrainian refugees arriving in Poland are available [30]. Finally, a recent study investigating the mental health of Ukrainian combatants [31] shows that civilian combatants in voluntary territorial defense forces have lower anxiety than combatants on active duty in the regular army. Apart from this research, little is known about the (mental) health conditions of different conflict-affected groups of Ukrainians seeking help, especially soon after the beginning of the invasion and resettlement (of internally displaced persons or refugees).

We compare the mental health status of refugees, migrants, internally displaced, and non-displaced people from Ukraine seeking psychological help and provide quantitative evidence on the mental health conditions of Ukrainians seeking help by their demographic and socio-economic characteristics.

2. Methods

Sample. We recruited and surveyed participants in the study as a part of our "Self-Help Online" program for adult Ukrainians [32]. The recruitment, data collection procedure, and study design were approved by the central ethical committee of the University of Kassel (decision letter zEK-033 from 25.05.22). After providing an information sheet explaining the details of the study and the program in plain language, we surveyed online participants who actively consented to data collection for scientific purposes and participation in the program. Our "Self-Help Online" program provided all participants with extensive online information about psychological (and other) support offered online to Ukrainians in Ukraine and other countries. The program also tested the "Self-Help Online" self-administrated individual course built around the WHO Self-Help + offline materials recommended for online adaptation by the WHO [33]. Program and surveys were implemented in Ukrainian language, but we offered respondents to get the materials in other languages.

We recruited participants within a compressed two-week timeframe (from June 22, 2022 to July 06, 2022) to deliver the materials quickly. We increased the frequency of program advertising closer to the deadline to minimize participants' waiting time. We used two main strategies in recruiting participants: (a) a social media campaign and (b) usage of the internal resources provided by the Ukrainian online educational platform where we delivered the program. See the methods section in the supplementary materials for details of recruitment strategy.

These efforts resulted in 1201 registrations with effective surveys within two weeks, out of which 35 were located neither in Ukraine nor the European Union, and one double registration. Accordingly, our survey sample consists of 1165 participants. Though our sample should by no means be considered representative of the population, but only of those seeking help online (see discussion of non-random survey bias) [34], we saw that generally, proportions of participants by country correspond to the proportions of refugees in these countries and that proportions of participants by birth region (oblast) correspond to the proportions of the population in these regions in Ukraine. We naturally have mostly female participants, with 104 male participants, and younger participants (Median Age: 36; Minimum Age: 18; Maximum Age: 74: SD = 10.11) than the Ukrainian population [35]. About 87 % have at least a bachelor's degree, which corresponds to 82.7 % totally enrolled or 88.8 % of women enrolled in tertiary education, as Ukraine is among the most highly educated societies in the world [35].

Tools. To screen for mental health conditions, we used widely accepted short (not more than six items) non-invasive tools with high construct validity: the WHO-5[36], MHI-5[37], and K6 scales[38]. These tools allowed us to minimize screening time and avoid potential re-traumatization while assessing respondents' mental well-being and psychological distress. We also provided validation in the Ukrainian context of much-needed non-invasive tools to screen for mental health conditions [8,9]. The WHO-5[36], MHI-5[37], and K6 scales were translated from English to Ukrainian by a leading researcher and then back-translated by a research assistant [38]. Following an iterative process with consultation of a third opinion, rare discrepancies between translation and back-translation were harmonized. The survey was implemented on the online platform, aiming as closely as possible to resemble the visual representation of the original scales.

The time frame of mental health status formulation mirrored the original scales: we asked participants about their mental health status over the last two weeks in the case of the WHO-5 scale, the last month in the case of the MHI-5 scale, and 30 days in the case of the K6 scale. Respondents were asked to rate how often they experienced a certain state in each item of each scale. We used two mental

well-being scales: WHO-5 scale and MHI-5 scale, and a psychological distress scale K6. In the case of mental well-being WHO-5 scale, participants were asked to indicate for each of the five following items which are closest to how they have been feeling over the last two weeks: (1) "I have felt cheerful and in good spirits"; (2) "I have felt calm and relaxed", (3) "I have felt active and vigorous", (4) "I have woken up feeling fresh and rested", (5) "My daily life has been filled with things that interest me". In the case of mental well-being MHI-5 scale, participants were asked for the following five items to rate "How much of the time, during the past month …": (1)"Were you a happy person?, (2) "Have you felt calm and peaceful?",(3) "Have you been a very nervous person?", (4) "Have you felt downhearted and blue?", (5) "Have you felt so down in the dumps that nothing could cheer you up?". In the case of psychological distress scale K6, participants were asked, "During the past 30 days, about how often did you feel …": "nervous", "hopeless", "restless or fidgety", "worthless", "so depressed that nothing could cheer you up", and "that everything was an effort". Answers on the items were aggregated (see methods sections in the supplementary materials for details) so that the WHO-5 scale ranged from 0 to 100, MHI-5 ranged from 1 to 25, and K6 ranged from 0 to 24.

All three scales – WHO-5, MHI-5, and K6 – showed good internal consistency in our sample: Cronbach's alpha values are 0.84 for the WHO-5 scale, 0.82 for the MHI-5 scale, and 0.83 for the K6 scale. Correlations between scales are statistically significant, and the mental well-being scales (WHO-5, MHI-5) positively correlate, whereas psychological distress (K6) and mental well-being (WHO-5, MH-5) scales correlate negatively. Pearson's correlation coefficient between mental well-being scales WHO-5 and MHI-5 is 0.7, whereas between mental well-being and psychological distress scales it is −0.65 for WHO-5 and K6 and -0.79 for MHI-5 and K6 (see the supplementary materials in Table S1). Scales in Ukrainian are available upon request.

We also elicited a set of demographic and socio-economic characteristics (gender, age, education, macro-region [39] of birth, employment status, financial support, registration of place of residence, studying or volunteering activities) as well as the migration status. We provide a detailed description of demographic and socio-economic variables used to explore the heterogeneity of mental health among respondents in the methods section in the supplementary materials.

Statistical Analysis. We conducted a statistical analysis with the help of R software version 4.0.3. First, we assessed Pearson's correlation between mental well-being scales (WHO-5, MHI-5) and psychological distress (K6). Next, we analyzed descriptive statistics of mental well-being on the WHO-5, MHI-5 scales and stress on the K-6 scale for the aggregated sample and by subgroups, testing the equality of group means with the help of t-tests or F-tests (when the number of groups is above two). Similarly, we tested the equality of proportions of individuals who score above the depression cut-offs for WHO-5, MHI-5, or the probable severe mental illness cut-off for K6. Finally, we ran linear regressions to study the association between respondents' demographic and socio-economic characteristics (that we analyzed descriptively) and their mental well-being on the WHO-5, MHI-5, or psychological distress K6 scales. In this analysis, we did not include variables for governmental financial support and place of residence as these are only available for the subsample of displaced respondents. We further studied potential associations between migration and respondents' mental health status with the help of the double-lasso procedure to account for potential confounders among a large set of controls (see list of control variables in appendix) [40]. In this procedure, we relied on a two-step method to identify covariates for inclusion: (1) fitting lasso regression predicting mental health status and (2) fitting lasso regression predicting migration status. Then, we included the union of the variables selected with this procedure in the linear regression. We deposited anonymized data and the replication code for the analysis in this paper in the Open Science Framework data repository https://osf.io/ep4sc.

Table 1
Mental health by demographic characteristics.

	Sample	Average WHO-5	WHO-5 Depression Cutoff $\leq$ 50	MHI-5 Severe Depression Cutoff $\leq$ 52	MHI-5 Happy	Average K6	Probable Serious Mental Illness (K6$\geq$13)
Full Sample	1165	37.5	0.81	0.71	0.07	13.15	0.57
Female	1061	37.18	0.81	0.72	0.07	13.3	0.58
Male	103	41.05	0.72	0.61	0.09	11.61	0.44
test of gender equality		0.0522	0.0462	0.0023	0.5607	0.0004	0.0084
Age 18–34	479	37.15	0.81	0.71	0.09	13.52	0.59
Age 35–49	530	37.24	0.81	0.73	0.07	13.03	0.57
Age 50+	118	38.98	0.78	0.69	0.03	12.13	0.48
test of age equality		0.4895	0.7369	0.4947	0.0514	0.0047	0.0404
Secondary School	141	36.45	0.8	0.7	0.07	13.51	0.62
Bachelor Degree	286	35.96	0.84	0.74	0.08	13.45	0.6
Master Degree	679	38	0.8	0.71	0.06	13.01	0.55
PhD	59	41.69	0.75	0.69	0.1	12.39	0.49
test of educational equality		0.0354	0.229	0.9676	0.54	0.181	0.1687
West	189	39.37	0.74	0.71	0.1	12.58	0.51
Center	398	36.87	0.82	0.73	0.06	13.27	0.58
South	291	39.35	0.78	0.68	0.11	13.05	0.56
East	238	34.92	0.86	0.74	0.04	13.47	0.6
test of geographic region equality		0.0039	0.0221	0.2247	0.0135	0.2606	0.4818

Note: Tests of equality report p-values for t-tests (two groups) or F-tests (for age, educational, or geographic area equality) of equality of means across the groups.

3. Results

Conflict-affected populations are likely to suffer from reduced mental well-being and high levels of stress. To understand the well-being of Ukrainians seeking help and the heterogeneity of mental health among them, we report descriptive results for the aggregate sample and by sub-groups. We focus on the following indicators of mental health: Mental well-being and probable depression based on the WHO-5 scale [36], probable severe depression and whether a person reported being happy based on MHI-5[37], as well as absolute stress and probable severe mental illness based on Kessler-6 (K6) [38].

General pattern. The general pattern emerging from our data is worrying (see the first row of Table 1). Average respondents have low mental well-being, and most of them can be classified as having probable depression and a high level of stress. On average, respondents score 37.46 points on the WHO-5 measure. To benchmark this value, consider that the Danish general population's average score on the WHO-5 scale is 70 points [41], refugees and asylum seekers with psychological distress in a cross-country study in Western Europe on average score ~47 points [42], and a value $\leq$ 50 points is used to assign 'screening diagnoses' of depression [36]. We see that 81 % of respondents are below the 50-point depression cut-off and that 64 % of respondents score below the severe depression cutoff based on MHI-5, whereas only 7 % can be classified as happy. Moreover, the average respondents score 13.15 on K6, which measures psychological distress. 57 % of respondents score 13 or higher on K6, indicating a high probability of having a serious mental disorder [38].

Mental health by demographic characteristics. Table 1 shows the breakdown of mental health status by demographic characteristics. 91.15 % of respondents in our sample are women, which is expected given the gender characteristics of the displaced population and conflict-affected conditions of non-displaced individuals. We see in our sample that compared to men, women show somewhat lower mental well-being based on the WHO-5 scale and higher levels of depression. We also see a strong indication of higher psychological distress on K6 in women compared to men. Women score 13.3, whereas men score 11.61 on K6 (1.69 points difference). In turn, as the average woman scores 13.3, most of the women (58 %) score above 13, indicating probable serious mental illness.

The age of respondents (based on the date of birth) ranges from 18 to 74. We see a homogenous pattern of low mental well-being and high depression levels among all age groups in our sample. However, we see a higher level of psychological distress in K6 among the younger cohort of respondents. The youngest cohort (18–34 years old) scores 0.49 points higher than the middle-aged cohort (35–49 years old), whereas the middle-aged cohort scores 0.9 points higher than the oldest cohort (50+ years old). Higher psychological distress among the younger population is commonly observed in the general population even if one accounts for item bias [43]. We also see some heterogeneity by level of education in mental well-being measured on the WHO-5 scale, but not in the level of depression or psychological distress.

Next, we break down the mental health status by macro-regions where the respondents were born: East (Donetsk, Kharkiv, Luhansk

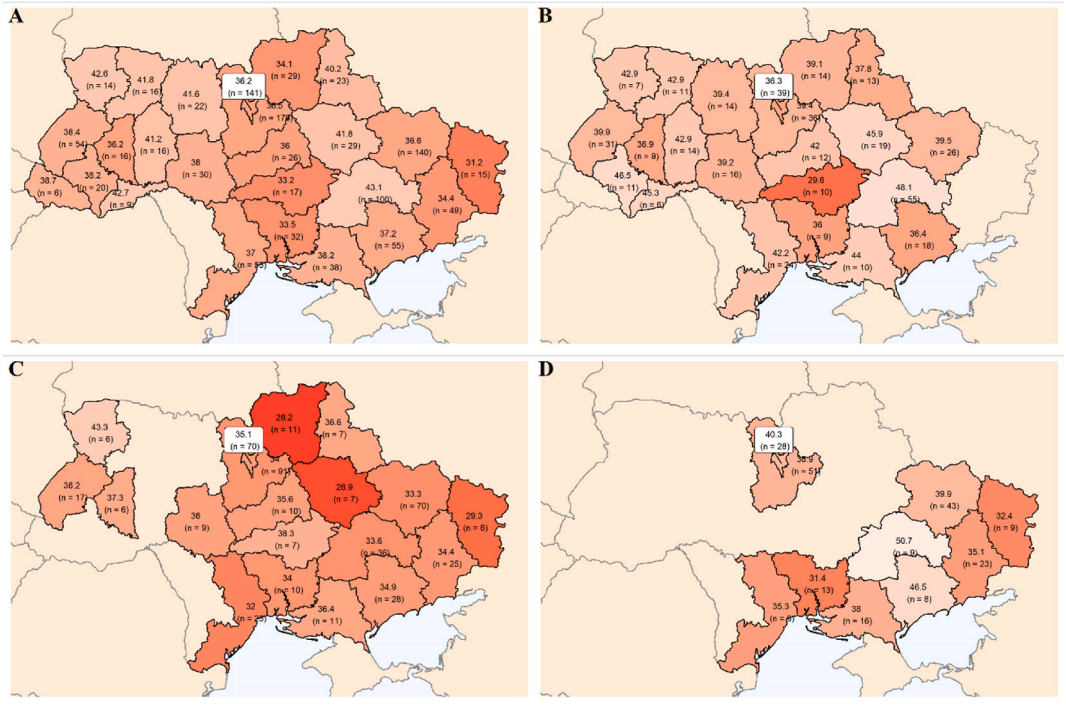

Fig. 1. Distribution of mental well-being of Ukrainians seeking help based on the WHO-5 scale by residence region before 2022 for the whole sample (Panel A), non-displaced (Panel B), externally displaced (Panel C), internally displaced (Panel D). Darker red tones on the map indicate lower mental well-being among respondents in our sample. Regions with fewer than 5 respondents are excluded. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

oblast), South (Odesa, Mykolaiv oblast, etc.), Center (Kyiv, Kyiv oblast, etc.), and West (L'viv, Volyn, Zakarpatska oblast, etc.). Compared to respondents born in the West of Ukraine, individuals born in the East of the country show a lower level of mental well-being and a higher level of depression. Respondents born in the East score 4.45 points (11% points) lower on the WHO-5 scale than people born in the West. 'Screening diagnoses' of depression are 12 % more common among respondents born in the East than those born in the West (86 % score below the depression cutoff in the East, whereas 74 % of respondents score below the depression cutoff in the West). Only 4 % of the respondents born in the East declare to be happy, which is less than half the (already low) value in the West, where 10 % of respondents declare to be happy.

Mental health by migration status and (prior) region of residence. Fig. 1 illustrates the distribution of mental well-being of Ukrainians seeking help in our sample based on the WHO-5 scale by their residence region before 2022 for the whole sample (Panel A) as well as by their migration status: non-displaced (Panel B), externally displaced (Panel C) and internally displaced (Panel D). Colors correspond to the average mental well-being on the WHO-5 scale, with darker red tones denoting lower mental well-being. We keep a neutral yellow color in the residence region before 2022 if we have fewer than five Ukrainians seeking help from this region in our sample.

We see in the top-left panel A of Fig. 1 that Ukrainians seeking help in our sample have low mental well-being on the WHO-5 scale, with an average not higher than 50 indicating "screening depression". Darker red tones are more common in the Central and Eastern parts of the country. The top-right panel B of Fig. 1 depicts the mental well-being of non-displaced Ukrainians residing within the country, with a relatively homogenous pattern of mental well-being (with no respondents who reside in the Luhansk region and one respondent in the Donetsk region - not shown on the map). The bottom-left panel C of Fig. 1 shows the mental well-being of the externally displaced (refugees). Visual inspection of panels A to C of Fig. 1 suggests lower mental well-being of refugees compared to the whole sample of non-displaced people. Finally, the bottom-right panel D of Fig. 1 shows that internally displaced people seeking help were residing mostly in the South-eastern part of the country and in Kyiv (city and oblast) before 2022.

Next, Fig. 2 shows density plots and boxplots of the distribution of psychological distress based on the K6 scale and grouped by migration status. We see in Panel A of Fig. 2 that, while all groups show high levels of psychological distress, the distributions of psychological distress for the internally (yellow area) or externally (red area) displaced are located to the right of the distribution of non-displaced Ukrainians (blue area). This indicates that internally or externally displaced people show higher levels of psychological distress compared to the non-displaced. A higher level of psychological distress is especially pronounced for the externally displaced (refugees), where one can see that most of the refugees (a larger part of the distribution) show psychological distress above the 13-point cut-off of probable serious mental illness.

Panel B of Fig. 2 shows that the median externally displaced Ukrainian seeking help (vertical line inside the box) has higher psychological distress than the median migrant, internally displaced, or non-displaced Ukrainian. The median non-displaced Ukrainian exhibits a high level of stress, which, however, is below the severe mental illness cut-off. The median migrant and the median internally displaced Ukrainian show psychological distress exactly at the level of the severe mental illness cut-off. However, median refugee psychological distress is above the severe mental illness cut-off.

Table 2 reports the breakdown of mental health status by migration status and socio-economic characteristics of Ukrainians seeking help. In line with a visual inspection, we observe a considerable gap between non-displaced people and refugees on all mental health indicators. Refugees score 6.71 points lower than non-displaced people on the WHO-5 scale. Probable depression on the WHO-5 scale is 16% points more common among refugees seeking help than among non-displaced people (89 % of refugees seeking help score below the depression cutoff, whereas 73 % of non-displaced people seeking help score below the depression cutoff).

Moreover, we see that refugees score 2.22 points higher than non-displaced people on psychological distress (14.25 for refugees vs. 12.03 for non-displaced people in our sample). To benchmark this value, consider that the average score on the K6 scale in the US general population did not exceed 2.8 in the period from 1997 to 2007 [44], and the difference on the K6 scale between respondents in our sample born in the East and West is 0.89. In turn, probable serious mental illness measured on the K6 scale is 18% points more prevalent among refugees seeking help than among non-displaced people (66 % of refugees seeking help show indication of probable serious mental illness, whereas 48 % of non-displaced people seeking help are at risk of probable serious mental illness).

Mental health by socio-economic status. We examine mental health status by employment and educational status (see Table 2). 7.5 % of Ukrainians seeking help have student status in Ukraine or abroad, and 58 % of Ukrainians seeking help in Ukraine or abroad have at

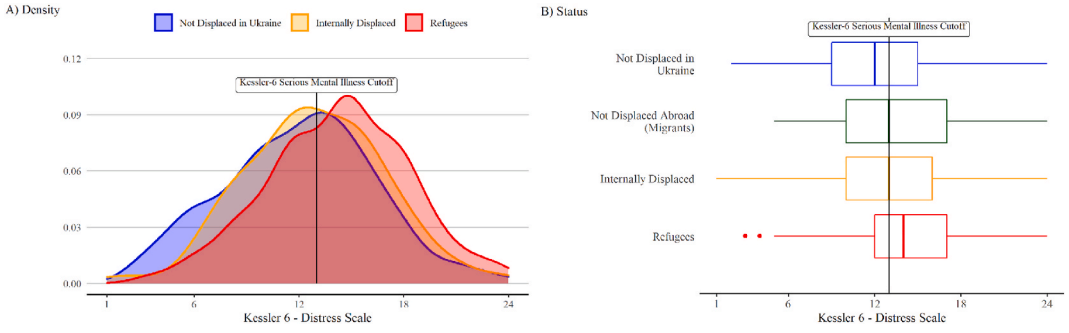

Fig. 2. Density plots (Panel A) and boxplots (Panel B) of psychological distress based on the K6 scale grouped by migration status. Migrants not reported on the density plot for clarity of presentation.

Table 2
Mental health by migration status and socio-economic characteristics.

	Sample	Average WHO-5	WHO-5 Depression Cutoff ≤ 50	MHI-5 Severe Depression Cutoff ≤ 52	MHI-5 Happy	Average K6	Probable Serious Mental Illness (K6≥13)
Full Sample	1165	37.5	0.81	0.71	0.07	13.15	0.57
Not Displaced in Ukraine	409	40.98	0.73	0.65	0.1	12.03	0.48
Internally Displaced	239	38.66	0.77	0.69	0.04	12.91	0.54
Not Displaced, Abroad (Migrants)	48	33.67	0.81	0.75	0.08	13.12	0.56
Refugees	469	34.27	0.89	0.78	0.06	14.25	0.66
test of status equality		0	0	0	0.0136	0	0
Employed Full Time	423	40.02	0.74	0.67	0.09	12.44	0.5
Employed Part Time	254	38.41	0.85	0.77	0.06	13.2	0.56
Self-Employed	53	40.68	0.75	0.6	0.11	11.74	0.51
Unemployed	276	33.59	0.88	0.74	0.04	14.05	0.67
Student	87	38.67	0.74	0.71	0.1	13.28	0.59
Other	72	30.72	0.89	0.75	0.04	14.53	0.67
test of employment status equality		0	0	0.0134	0.1137	0	0.0002
Registered *	592	35.78	0.85	0.75	0.06	13.78	0.61
Not Registered *	125	36.13	0.82	0.73	0.05	13.7	0.62
test of registration status equality		0.8254	0.3057	0.614	0.6606	0.8362	0.8214
Receive Financial Support *	386	34.89	0.87	0.75	0.05	13.87	0.62
No Financial Support, Aware of Opportunities *	169	39.36	0.79	0.7	0.06	13.12	0.56
No Financial Support, Not Aware of Opportunities *	154	33.87	0.86	0.81	0.04	14.36	0.68
test of financial support equality		0.0013	0.0543	0.2288	0.6884	0.0234	0.0865
Studying	713	38.75	0.77	0.68	0.08	12.87	0.55
Not Studying	452	35.52	0.86	0.76	0.05	13.6	0.6
test of studying equality		0.0004	0.0003	0.0681	0.0236	0.0047	0.0994
Volunteering	506	40.32	0.75	0.67	0.09	12.6	0.51
Not Volunteering	659	35.34	0.85	0.75	0.05	13.57	0.61
test of volunteering equality		0	0	0.0395	0.008	0.0001	0.0005

Note:* only present for displaced (externally and internally) participants. Tests of equality report p-values for t-tests (two groups) or F-tests (for migration status, educational, employment, or financial support equality) of equality of means across the groups.

least part-time employment, whereas 23 % are unemployed. We see a strong heterogeneity in mental health status by employment and educational status across all indicators. Unemployed Ukrainians seeking help on average score 14.05 on the K6 scale, and 88 % of them are at risk of depression on the WHO-5 scale, whereas full-time employed Ukrainians score 12.44 on the K6 scale and 74 % of them are above the probable depression cut-off.

Our sample comprises non-negligible numbers of refugees and internally displaced people who did not register their residence and, thus, are not necessarily present in the official statistics. In our sample, 18 % of refugees and internally displaced people did not register their residence (see Table 2). We, however, do not observe substantial differences in mental health between those who register and those who do not. Moreover, we do not see a difference in mental health by registration status among refugees or internally displaced individuals (not reported in the table).

European Union countries provide financial support for refugees. Many refugees in our sample are aware of these opportunities and receive governmental financial support (social welfare, reimbursement for rent, etc.). 55 % of refugees in our sample receive some financial support. 78 % are aware of these opportunities, but the remaining 22 % do not know about these opportunities and do not receive financial support. These 22 % of refugees in our sample have lower mental well-being on the WHO-5 scale and higher psychological distress on the K6 scale than those who are aware of financial opportunities. Those who are not aware of financial opportunities (and thus stay without financial support) score 5.49 points lower on the mental well-being WHO-5 scale and 1.24 points higher on psychological distress than those who are aware of financial opportunities but do not receive financial support (relying on their own funds). 68 % of those who are not aware of financial opportunities are above the cut-off for probable serious mental illness on the K6 scale.

Despite the circumstances, 61 % of the Ukrainians seeking help engage in some form of studying (university, technical academy, online course, vocational training, etc.). Those who study (and are capable to study) report better mental well-being on all indicators compared to those who do not. Moreover, 43 % of Ukrainians seeking help engage in volunteering activities themselves. Those who are (and are capable of) volunteering have relatively alleviated mental-health conditions compared to those who do not on all mental health indicators. Those who volunteer declare to be happy more than twice as often as those who do not (9 % happy among volunteers, with only 5 % happy among those who do not).

Mental health of displaced individuals by location. We have a look at the mental health status among the internally or externally displaced (refugees) by their country of location. Panel A of Fig. 3 illustrates the average mental well-being of Ukrainians seeking help

based on the WHO-5 scale by country of location (darker red tones indicate lower mental well-being). Visual inspection shows a relatively homogenous pattern of low mental well-being among displaced Ukrainians seeking help, with a slightly better situation among displaced Ukrainian who stayed in their home country. Panel B of Fig. 3 shows that the median displaced Ukrainian seeking help scores below 50 on the WHO-5 scale in any country, indicating that "screening depression" is prevalent irrespective of the country of location.

Regression-based analysis. To further study the potential association between demographics, migration status, socio-economic characteristics, and mental health status of Ukrainians seeking help, we employ a linear regression predicting mental well-being on the WHO-5, MHI-5, or the psychological distress K6 scales. Results are reported in Table 3. We first include the demographic characteristics discussed in previous sections (see Table 3 models 1, 3, and 5). Then we add migration status and socio-economic characteristics to the linear regression to explore associations between these factors and the mental health of respondents (see Table 3 models 2, 4, and 6).

In line with the descriptively observed patterns, we see heterogeneity by gender. We see somehow lower well-being among women compared to men on the WHO-5 scale (see Table 3: models 1 and 2) and statistically significantly lower well-being among women compared to men on MHI-5 even when we account for other factors (see Table 3: models 3 and 4). In line with previous literature, we also see that women tend to have higher psychological distress on K6 compared to men when we control for other variables (see Table 3: models 5 and 6). Similarly, we see a statistically significant association between the age of respondents and psychological distress on the K6 scale. We do not see stable statistically significant heterogeneity by education level. Being born in East of Ukraine is associated with lower mental well-being on WHO-5 and higher psychological distress on K6, but this association loses statistical significance once we account for migration status and socio-economic characteristics (which may be the underlying causes of disparity).

Next, we see heterogeneity both in well-being and psychological distress by migration status (see Table 3: models 2, 4, and 6). Refugees have statistically significantly lower mental well-being on WHO-5, MHI-5, and higher psychological distress on the K6 scale compared to non-displaced in Ukraine, even when we account for respondents' demographic and socio-economic characteristics. We also see that migrants have statistically significantly lower mental well-being on the WHO-5 scale than non-displaced respondents in Ukraine, whereas the internally displaced have significantly higher psychological distress on K6 compared to the non-displaced. Regarding labor conditions, the unemployed have statistically significantly lower mental well-being on WHO-5 compared to fully employed respondents. However, those who (can) study show statistically significantly higher mental well-being on WHO-5 and MHI-5 even when we account for other factors. Moreover, those who are (and are capable of) volunteering have statistically significantly higher mental well-being on WHO-5, MHI-5, and lower psychological distress than those who are not.

While multiple factors are associated with the mental health status of Ukrainians seeking help in the European Union and Ukraine, we observe that refugee status seems to be a stable and strong predictor of mental health status. To assess the robustness of this observation, we use a machine learning approach to find and account for potential confounders among a large set of controls with the help of the double-lasso procedure (see the list of control variables used for selection in Supplementary Table S2) [40]. These regressions are reported in Table 4. The machine learning procedure selects a large set of controls (female, employment status, new user

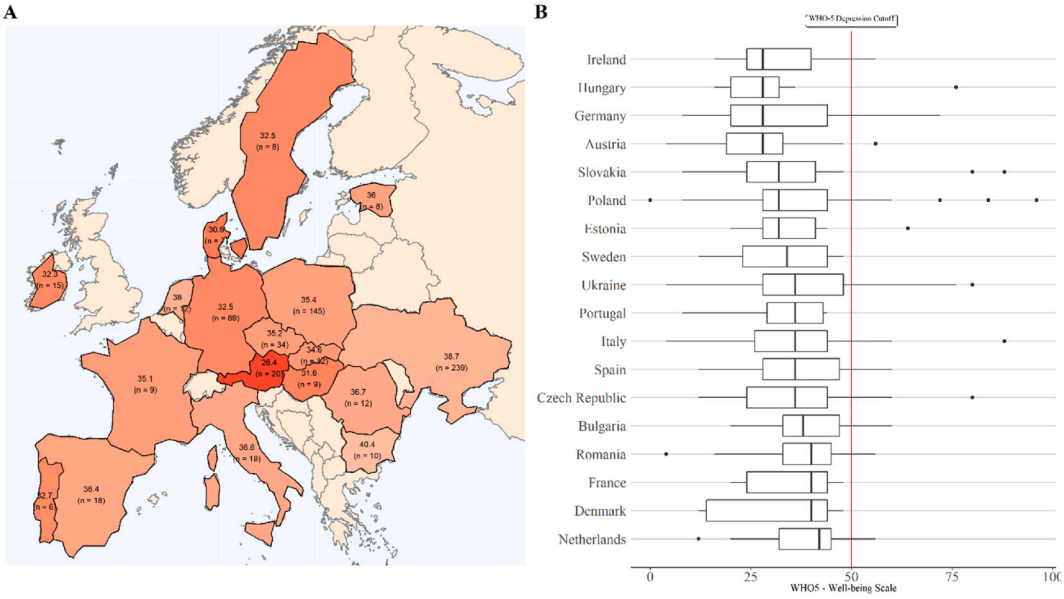

Fig. 3. Distribution of average (Panel A) and boxplots (Panel B) of mental well-being of displaced Ukrainians seeking help based on the WHO-5 scale by country of location. Darker red tones on the map indicate lower mental well-being. Countries with fewer than 5 respondents are excluded. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

Table 3
OLS regression analysis of demographics, migration status and socio-economic factors related to well-being and distress levels.

	Dependent variable:					
	WHO-5 Well-being		MHI-5 Well-being		Kessler-6 Distress	
	(1)	(2)	(3)	(4)	(5)	(6)
Female	−3.40**	−1.29	−6.52***	−4.60**	1.63***	1.02**
	(1.59)	(1.60)	(1.80)	(1.84)	(0.44)	(0.45)
Age	0.01	−0.04	−0.01	−0.05	−0.03**	−0.03*
	(0.05)	(0.05)	(0.06)	(0.06)	(0.01)	(0.01)
Education - Bachelor	−0.46	−0.06	−0.98	−0.95	0.06	0.06
	(1.63)	(1.63)	(1.85)	(1.89)	(0.45)	(0.46)
Education - Master	1.80	1.13	0.45	−0.22	−0.26	−0.08
	(1.55)	(1.59)	(1.76)	(1.84)	(0.43)	(0.45)
Education - PhD	5.93**	3.86	1.49	0.04	−0.77	−0.34
	(2.58)	(2.57)	(2.92)	(2.96)	(0.72)	(0.72)
Birth Region - Center	−1.87	−1.06	−0.95	−0.01	0.64*	0.33
	(1.39)	(1.36)	(1.58)	(1.57)	(0.39)	(0.38)
Birth Region - East	−3.63**	−1.93	−1.73	0.17	0.75*	0.15
	(1.53)	(1.54)	(1.74)	(1.77)	(0.43)	(0.43)
Birth Region - Other	−1.50	0.73	1.83	3.59	0.86	0.32
	(2.54)	(2.48)	(2.88)	(2.86)	(0.71)	(0.70)
Birth Region - South	0.83	1.61	1.10	1.97	0.28	−0.01
	(1.47)	(1.44)	(1.67)	(1.66)	(0.41)	(0.40)
Status - Refugee		−4.06***		−4.94***		1.67***
		(1.17)		(1.35)		(0.33)
Status - Internally Displaced		−1.06		−2.53*		0.75**
		(1.27)		(1.47)		(0.36)
Status - Not Displaced Abroad (Migrants)		−6.32***		−4.11		0.82
		(2.30)		(2.65)		(0.65)
Employment Status - Partially Employed		−0.87		−2.53*		0.20
		(1.27)		(1.47)		(0.36)
Employment Status - Self Employed		0.20		3.19		−0.74
		(2.23)		(2.57)		(0.63)
Employment Status - Student		−0.43		−1.08		0.10
		(2.11)		(2.44)		(0.59)
Employment Status - Unemployed		−4.35***		−1.80		0.59
		(1.31)		(1.52)		(0.37)
Employment Status - Other		−6.50***		−2.92		1.30**
		(1.99)		(2.30)		(0.56)
Is Studying		1.89**		1.96*		−0.43
		(0.95)		(1.09)		(0.27)
Volunteering		3.54***		2.09*		−0.55**
		(0.94)		(1.08)		(0.26)
Constant	40.32***	40.59***	50.75***	51.53***	12.62***	12.41***
	(2.54)	(2.84)	(2.88)	(3.28)	(0.71)	(0.80)

Note: Standard errors (s.e.) in parentheses. *p < 0.1**p < 0.05***p < 0.01.

on the platform, etc.). However, the statistically significant mental health penalty of the refugee status observed without accounting for confounders (see Table 4: models 1, 3, and 5) remains robust to the inclusion of these controls (see Table 4: models 2, 4, and 6). When we include them, refugee status is still associated with lower mental well-being (3.09 points less, s.e. = 1.26, on a 100-point WHO-5 scale; 4.41 points less, s.e. = 1.44, on a 100-point MHI-5 scale) and higher psychological distress (1.36 points more, s.e. = 0.35, on a 24-point K6 scale) compared to non-displaced Ukrainians in our sample. Interestingly, besides demographic and socio-economic characteristics (female, employment status, volunteering) and variables associated with our recruitment strategy (time of registration, new user on platform), the procedure selects the time preferences of the respondent (as a predictor for WHO-5 and K6 scales) and whether the respondent (has to) learn foreign languages (as a predictor for WHO-5, MHI-5, and K6 scales).

4. Discussion

We screen refugees, migrants, internally displaced and non-displaced people from Ukraine seeking help in Ukraine and 24 European countries for their mental health. Most Ukrainians seeking help suffer from low mental well-being and high stress levels indicating they are at risk of depression and severe psychological distress. Refugees and internally displaced individuals in our sample show a particularly high risk of depression and severe psychological distress. Those who are unemployed and those who do not know about governmental support programs show especially worrying levels of mental health status. Nevertheless, we see that the majority of Ukrainians seeking help do work, study, or volunteer. Those who are engaged in these activities have relatively alleviated mental well-being levels.

Table 4
OLS regression analysis of factors related to well-being and distress levels (controls selected with the double-lasso procedure).

	Dependent variable:					
	WHO-5 Well-being		MHI-5 Well-being		Kessler-6 Distress	
	(1)	(2)	(3)	(4)	(5)	(6)
Status - Refugees	−6.71***	−3.09**	−6.87***	−4.41***	2.21***	1.36***
	(1.03)	(1.26)	(1.16)	(1.44)	(0.28)	(0.35)
Status - Internally Displaced	−2.32*	−1.27	−3.26**	−2.82**	0.88**	0.68**
	(1.23)	(1.22)	(1.40)	(1.41)	(0.34)	(0.34)
Status - Not Displaced Abroad (Migrants)	−7.31***	−5.71**	−4.93*	−3.79	1.09*	0.63
	(2.31)	(2.31)	(2.62)	(2.67)	(0.64)	(0.65)
Female		−1.02		−4.47**		0.89**
		(1.57)		(1.81)		(0.44)
Employment Status - Part-Time		−1.11		−1.75		0.36
		(1.23)		(1.41)		(0.34)
Employment Status - Self-Employed		−0.28		4.48*		−0.47
		(2.19)		(2.51)		(0.61)
Employment Status - Student		0.32		1.05		0.31
		(1.79)		(2.06)		(0.50)
Employment Status - Unemployed		−4.13***		−0.70		0.68*
		(1.29)		(1.48)		(0.36)
Employment Status - Other		−7.38***		−3.43		1.56***
		(1.94)		(2.22)		(0.54)
Volunteering		4.21***				−0.68***
		(0.90)				(0.25)
Program Enrolment Time		0.0000		0.0001		−0.0000
		(0.0001)		(0.0001)		(0.0000)
New User		−0.56		−0.86		0.38
		(1.08)		(1.24)		(0.30)
Time Preference		0.85***				−0.22***
		(0.21)				(0.06)
Learning Foreign Language		−2.38**		−2.85**		0.57**
		(1.03)		(1.19)		(0.29)
Constant	40.98***	35.77***	47.84***	52.67***	12.03***	12.80***
	(0.75)	(2.42)	(0.85)	(2.21)	(0.21)	(0.67)
F-test of Status Joint Significance		0.02		0.02		0
Observations	1165	1159	1165	1165	1165	1159
Adjusted R^2	0.04	0.09	0.03	0.04	0.05	0.08

Note: Standard errors (s.e.) in parentheses*p < 0.1**p < 0.05***p < 0.01.

Our results indicate that despite considerable prior efforts [4], there is an urgent need to develop methods to improve the mental health situation among the conflict-affected Ukrainian population at scale. With an online platform, we were able to reach out to a large number of Ukrainians seeking help in a short time period, across 25 countries and irrespective of their migration status. This shows the potential of complementing existing offline psychological services with online tools that can be provided to anyone who has access to the Internet. Moreover, programs that inform about available support options or help to improve the labor situation among the conflict-affected population may be bundled with mental health interventions to achieve better results. Implementing such long-term policies may be helpful, given that poor socio-economic factors (unemployment, lack of social support, poor host language proficiency) are associated with a higher risk of depression even years after forced migration [26]. Finally, while we screen individuals who were seeking help as part of the "Self-Help Online" program, systematic screening for the mental health of the conflict-affected population can help to reach out to those who are in need, thus augmenting targeted mental health policies.

Our study has several limitations. First, we focus on Ukrainians seeking help rather than the general population; thus, our results require caution in interpretation and should not be used for prevalence estimates in the general Ukrainian population [34]. However, our aim is to provide a descriptive analysis to help understand mental health needs among conflict-affected help-seekers, where non-random sampling might be appropriate [34]. Second, to avoid re-traumatization, we did not ask if subjects had traumatic experiences, which could have helped to shed light on the causes of low mental health status. Finally, we provide an early assessment of mental health among Ukrainian help-seekers while further research can investigate the prevalence of post-traumatic disorder, and a longitudinal study can help to assess the long-term consequences of forced migration.

These limitations notwithstanding, we contribute to much-needed evidence about the mental health of migrants soon after resettlement [27], by uniformly assessing the mental health of help-seeking forced migrants (refugees and internally displaced individuals) compared to help-seeking non-displaced people from Ukraine four months after the beginning of the conflict. Moreover, we provide policy-relevant estimates that help to understand which groups of Ukrainian help-seekers require special attention.

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Data availability statement

We share anonymized data and an R replication package for the analysis in this paper in the Open Science Framework data repository: https://osf.io/ep4sc.

CRediT authorship contribution statement

Anastasiya-Mariya Asanov: Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing – review & editing, Investigation, Resources. **Igor Asanov:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Guido Buenstorf:** Conceptualization, Funding acquisition, Resources, Supervision, Writing – review & editing, Methodology, Project administration.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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