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## War impact on Ukrainian university women: Does location status effect depression and quality of life factors?

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We would like to provide commentary on the mental health and quality of life of Ukrainian women who are victims of war and concern to healthcare specialists (Cinaroglu, 2023; Straiton et al., 2023). These women can be divided into three groups: (a) those who continue to live where there is regular shelling, bombing or blockade; (b) internally displaced persons (IDP) who have been forced or obliged to flee or leave their homes to avoid armed conflict, violence, violations of human rights; and (c) people who have fled to another country as refugees. Distinct from refugees, IDP are often more disadvantaged because they do not benefit from assistance provided by international agencies unless national government requests for assistance are honored (Office of the High Commissioner for Human Rights, 2023).

In our study, we hypothesize that location status is associated with depression, substance use and quality of life. A total of 1768 Ukrainian university affiliated women responded to our on-line survey conducted in major population centers affected by the war with Russia that began on February 22, 2022. The study cohort included 77.3% not relocated (NR), 10.3% internally displaced (IDP), and 12.4% refugee (RF) women. Among the respondents, 44.7% were married or partnered, 25.1% reported being secular (non-religious) (SE), and 74.9% religious (RE).

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Our online survey was conducted from September 2022 to January 2023. Respondents were from five Ukrainian universities where education continued online under adverse conditions. Snowball sampling, the Qualtrics software platform for data collection and SPSS, version 25 for statistical analysis were used for the survey. Standardized data collection instruments included the Patient Health Questionnaire (PHQ-9) to assess depression (Kroenke et al., 2001); and the World Health Organization -Quality of Life Scale (WHOQOL) (WHO, 2022). The instruments we used have been found reliable with Cronbach's alpha scores of PHQ-9=0.877; WHOQOL = 0.907. Survey respondents provided information about their age, marital status, religiosity, study, work and location (i.e., not-relocated (NR), internally relocated (IDP), refugee (RF). Also, details were reported about substance use (i.e., tobacco, alcohol, pain relievers, and sedatives). Our research team was led by the Ben Gurion University of the Negev-RADAR Center that provided research, analysis and additional forms of assistance.

Responses to the Patient Health Questionnaire were not found to be significantly different when location statuses were compared NR (M=10.3; SD = 6.1); IDP (M=11.5; SD = 6.5), and RF (M=10.5 SD = 6.3), (p=0.085). However, t-test showed a significant change in PHQ-9 depression scores associated with religiosity level. The mean scores were SE (M=11.6; SD = 6.5) and RE (M=10.0; SD = 6.0) (p<0.001). Two-way ANOVA showed no significant change in average depression scores associated with location and religiosity. Item #9 of the PHQ-9 asks about suicidal ideation. A positive response to this question was given by 24.7% NR, 32.3% IDP and 34.9% RF respondents ( $\chi^2(2) = 11.256$ ; p = 0.004) as well as 37.4% SE and 22.9% RE respondents ( $\chi^2(1) = 30.755$ ; p < 0.001).

WHOQOL physical health, psychological, social relationship, and environment domain related responses were transformed from 0 to 100 scale. The overall 58.7 (SD = 13.1) score indicates a poor to fair quality of life among the respondents (Hawthorne et al., 2006). One-way ANOVA showed significant change in average QOL scores associated with location: NR (M=59.3; SD = 12.8); IDP (M=55.2; SD = 14.1); and RF (M=58.3; SD = 14.1);13.6) (p<0.001). The Bonferroni post hoc test showed that QOL scores were higher for NR respondents than those with IDP status (p < 0.001). The t-test showed significant differences in average QOL scores associated with religiosity: SE (M=57.1; SD = 13.6); RE (M=59.3; SD = 12.8) (p=0.005).Two-way ANOVA showed no significant change in average WHOQOL scores associated with location and religiosity. Regardless of location status, the correlation between WHOQOL and PHQ-9 scores is r = -0.649 (p < 0.001).

During the war, 72.7% of the women reported last month any substance use. Specifically, the percentage of respondents reporting use were 59.6% alcohol (including 10.6% binge drinking), 28.6% tobacco, 19.6% pain reliever, and 16.9% sedative use. Last month any substance use was significantly different based on location status – 70.4% NR, 79.7% IDP, and 80.5% RF respondents ( $\chi^2(2)=12.927$ ; p=0.002); and religiosity – 79.5% SE and 70.3% RE respondents ( $\chi^2(1)=12.324$ ; p<0.001). Last month binge drinking was reported by 9.2% NR, 13.2% IDP, and 17.3% RF respondents ( $\chi^2(2)=12.758$ ; p=0.002); and 14.8% SE and 9.1% RE ( $\chi^2(1)=10.056$ ; p=0.002). Regardless of location status, respondents who reported last month substance use had lower quality of life (t(1355)=4.531; p<0.001) and higher PHQ-9 depression scores (t(1427)=5.395; p<0.001).

The stepwise regression analysis (Adjusted R<sup>2</sup>=0.475) we conducted showed WHOQOL average scores associated with depression ( $\beta$ =-0.681; p<0.001), marital status ( $\beta$ =0.142; p<0.001), age ( $\beta$ =-0.124; p<0.001), religiosity ( $\beta$ =0.065; p<0.001); and IDP ( $\beta$ =-0.047; p=0.009). Additional independent variables (e.g., NR and RF statuses, substance use or increased substance use, etc.) did not significantly increase the proportion of explained variance.

For the most part, our study results showed that war associated displacement negatively affects the quality of life and mental health (e.g., depression and suicide ideation) of women regardless of their location. However, our findings including regression analysis, evidence internally (i.e., within country) displaced persons as the most affected group by war. These results are consistent with other studies about the war impact on Ukrainian civilians (Ben-Ezra et al., 2023); and support the conclusion that religiosity maybe a protective factor in crisis situations elsewhere (Shai, 2022). Regardless of location, we found religious respondents less depressed, less inclined to use substances and more likely to have a higher quality of life.

Our findings are based on a limited cross-sectional cohort of university women. Additional study, over time involving non-university respondents including males and other locations throughout the Ukraine, is needed to better understand the short- and long-term impact of the present Russian-Ukrainian war. Also, it is important to understand that our findings are based on the responses of a select population of women who had internet access that limits the generalizability of the results. However, we believe this does not mitigate the significance of uniform data collection and analysis for information sharing about the health of women across regions and countries, especially those in conflict.

In severe disaster conditions, with life-threatening conditions of scarce food, water, shelter, electricity, and more, like those evidenced from the war between Israel and Hamas controlled Gaza, the acquisition of timely and relevant research is difficult (Konstantinov et al., 2023). Furthermore, we believe such conditions can have a severe impact on years of positive development to promote peace, health and well-being (Isralowitz, 2017).

In time, it is our collective opinion that opportunities will be generated to promote research and response to women in conflict areas including those moving forward with healthcare professional development through higher education and service.

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