

The Russian-Ukraine War's Mental Health Impacts: Canadian Residents of Ukrainian and Non-Ukrainian Descent Appear to Be Equally Impacted

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ABSTRACT

Objective: The study aims to assess the mental health impact of the Russian invasion of Ukraine on a specific sample of Canadian residents who self-subscribed to the Text4Hope Ukraine program.

Methods: The study uses an online survey to collect sociodemographic, war-related, and clinical information about Text4Hope Ukraine subscribers. Outcome measures include baseline scores from the validated scales, including the Generalized Anxiety Disorder 7-item (GAD-7) Scale, Patient Health Questionnaire-9 (PHQ-9), Brief Resilience Scale (BRS), and Perceived Stress Scale 10-Item. (PSS-10).

Results: Out of 222 subscribers, 81 responded to the survey, yielding a response rate of 36.5%. The study findings reflect a prevalence of low resilience (59.7%), moderate to high stress (87.5%), likely GAD (45.8%) and likely major depressive disorder (MDD; 38.9%). Respondents who identified as female had a higher likelihood of presenting with low resilience ($p = .02$) and moderate to high anxiety ($p = .03$) compared to male respondents. No statistically significant difference was found regarding the mean scores for the four psychological problems.

Conclusions: War can have potentially negative impacts on all populations, irrespective of their location or association with the impacted country. Governments should target and provide adequate mental health and psychosocial support or interventions for at-risk global populations during war.

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War is a devastating and traumatic occurrence that can have both short- and long-term effects. The short-term costs of war include the destruction of physical infrastructure, poor economic and political institutions, and loss of life (Colletta & Cullen, 2000). The long-term consequences of war greatly impact individuals' development and social cohesion, thus affecting societal and developmental outcomes (Barceló, 2021; Colletta & Cullen, 2000). One attribute of traumatic incidents is their tendency to produce fear in direct response to the threat of possible injury or death (Spitzer et al., 2002). On February 24, 2022, Russia escalated a military invasion of Ukraine, leading to the death of thousands and

the displacement of tens of thousands of Ukrainians. This has been disseminated in the media on a large scale through daily reports. The Canadian and other governments worldwide have taken measures to help Ukrainians relocate abroad. As of June 2022, three chartered flights arrived in Canada with Ukrainian residents to support those fleeing Russia's invasion of their country (Government of Canada, 2022b). In addition, data from Canada Border Services Agency suggests that Ukrainian citizens and returning Canadian permanent residents of Ukrainian origin who arrived in Canada between January 1-September 11, 2022 numbered 13,599 by land and 73,262 by air (Government of Canada, 2022a). Some of

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these individuals may have experienced the war firsthand before evacuating to Canada or left loved ones behind. Other Ukrainians who may have been in Canada before the invasion may still have other relatives and loved ones remaining in Ukraine.

The war has also led to the displacement and exile of several people, leading to an influx of refugees that may result in public health threats in neighboring countries, as well as physical stressors associated with the burden of resettlement (Anjum et al., 2023; Lewtak et al., 2022). The traumatic effect of war may result in extensive emotional and psychological responses. Individuals react to traumatic events differently, and reactions to trauma are usually exhibited emotionally, physically, or cognitively, and distinguishing among these is often difficult (Anjum et al., 2023).

One study conducted after Russia's invasion of Ukraine among samples of Poles living in neighboring Poland (Kaniasty et al., 2023) suggested that the intensity of wars resonates past the boundaries of the involved countries. Their study reported higher levels of a sense of danger due to the war and predicted higher levels of psychological distress. Thus, the repercussion of the war is still felt by individuals not living in Ukraine. The results of another study among Ukrainian refugees living in Poland reported 73% of respondents to experienced depression, anxiety disorders, and post-traumatic stress disorder (PTSD) after a screening test (Długosz, 2023).

Both direct and indirect exposure to disasters can have a major impact on individuals' social and psychological functioning (Bhugra & van Ommeren, 2006). With the advancement of technology, war and conflicts from around the world can be transmitted quickly and immediately through different media channels, creating significant anxiety, feelings of helplessness, and fear in the general public (Pe'er & Slone, 2022). Constant exposure to media images of the war in Ukraine can indirectly affect the mental well-being of Canadians. The results from one study reported the degree of exposure to armed conflict through the media to be directly associated with psychological distress and post-traumatic symptoms (Dvir Gvirsman et al., 2014). Published research on the effects of 9/11 also showed that even individuals distant from the disaster experienced some indirect effects (Mijanovich & Weitzman, 2010). Furthermore, a survey examining the mental health status and associated factors of the Russian invasion of Ukraine reiterated the indirect effect of war among residents in the neighboring countries, with more than half of the Taiwanese (54.3%) and Polish (80.3%) participants upset by the war scenes in the media (Chudzicka-Czupala et al., 2023). The study also reported the female gender and past psychiatric history to be associated with higher Depression Anxiety and Stress Scale (DASS-21) scores and to be risk factors for the development of depression, anxiety, stress, and post-traumatic stress symptoms. This indicates that some individuals can experience indirect trauma from a man-made disaster despite not being physically present at the site of the disaster. In particular, media coverage of war, disasters, terrorism, or violence can significantly impact some individuals in the general public and increase their risk perception and stress (Rubaltelli et al., 2018). A systematic review reported the risk of major depressive disorder to range between 4%-10% in the general population who have not been direct victims of traumatic events such as terrorist attacks (Salguero et al., 2011).

A study with refugees in Sweden reported generally poorer mental health among this cohort, particularly women (Çetrez et al., 2021). Data from the World Mental Health Surveys of nearly 70,000 adult participants from 24 countries with varying economic status indicated that at some period in their life, 70.4% of the participants had experienced at least one type of traumatic event (Kessler et al., 2017). After exposure to trauma, an individual's resilience is essential for their subsequent survival and well-being. Resilience is an adaptive phenomenon that refers to patterns of positive adaptation in the context of past or present adversity (Riley & Masten, 2005). Resilience comprises adapting well after encountering distress, difficulty, trauma, disaster, and threats. Resilient people use positive emotions to rebound and find positive meaning even in stressful circumstances (B. Agyapong, Obuobi-Donkor, et al., 2022; Tugade & Fredrickson, 2004).

Levels of resilience, stress, depression, and anxiety are often impacted by exposure to extreme stress. A study in Canada reported that respondents who'd experienced COVID-19 and one additional trauma (either flood or wildfire traumas) were 11 times more likely to have symptoms of generalized anxiety disorder (GAD), four times more likely to have major depressive disorder (MDD), and 10 times more likely to have PTSD and low resilience (B. Agyapong, Shalaby, et al., 2022). Although the war affects neighboring countries, the impact on Ukraine has been enormous. A cross-sectional survey reported Ukrainian volunteers to have significantly higher depression, anxiety, and stress levels than their Polish counterparts (Chudzicka-Czupala et al., 2023). Such reactions are normal in these circumstances, as they are among the Ukrainians who have experienced the direct threat of the Russian invasion in their own lives, and in the lives and

livelihood of loved ones. Some Russian residents who are against the Ukraine invasion or who have loved ones directly involved in the conflict may also be indirectly affected by the war. Furthermore, Canadians in general may be adversely affected by the war. In these types of circumstances, low intensity interventions such as text messages could potentially enhance resilience and promote psychological well-being.

This study aims to assess the potential mental health impacts of the Russian invasion of Ukraine on residents of Canada, including those of Ukrainian descent and those who have other forms of association with Ukraine. Another goal of the study is to assess if differences exist regarding the psychological problems between Canadian residents of Ukrainian and non-Ukrainian descent. Our study sample is hypothesized to have high levels of stress, anxiety, and depression and low levels of resilience. Canadian residents of Ukrainian descent are also hypothesized to have an increased psychological burden compared to Canadian residents of non-Ukrainian descent.

Methodology

Study Setting and Design

This study was conducted in Canada, with participants being recruited across provinces and territories. The general public in Canada was invited to self-subscribe to a text messaging program (Text4Hope-Ukraine). The program was launched on March 15, 2022 as a collaboration among the Royal Bank of Canada (RBC) Foundation, the Alberta Mental Health Foundation, and the Global Psychological eHealth Foundation. Promotional material about the program was shared through press releases, organizational websites, and media social feeds during the early stages of the Russian invasion of Ukraine (Mental Health Foundation, 2022). The service included the provision of supportive text messages aligned with the principles of cognitive behavioral and trauma therapies. This program is self-subscribed, with completion of the survey component being voluntary and receipt of the daily supportive messages not being contingent on survey completion. Individuals could join the 3-month program by texting “Hope4Ukraine” to a short code number. The study adopted a cross-sectional survey design and involved an online self-administered questionnaire delivered via text message upon subscription to the Text4Hope-Ukraine program as part of a welcome message. On average, the survey took 10 minutes to complete and captured data related to various sociodemographic, war-related, and psychological variables.

Data Collection and Outcome Measures

Data collection occurred between March and April 2022. Collected data included demographic information (i.e., age, sex at birth, ethnicity, education level, relationship status, employment status, and housing status) and Ukrainian heritage-related items (i.e., “Are you or have you previously held citizenship or do you have ancestors/family from Ukraine [Ukrainian descent]? Do you have family or friends living in Ukraine? Do you have family or friends in Ukraine who have died from the war in Ukraine? Do you have family or friends who have had to move out of Ukraine to neighboring countries because of the war in Ukraine? During the war in Ukraine, have you been fearful for the lives of any family or friends in Ukraine?”). Clinical outcome measures included scores of validated scales, including the Generalized Anxiety Disorder 7-item (GAD-7) Scale (GAD-7 score ≥ 10 indicating likely GAD; Spitzer et al., 2006), the Patient Health Questionnaire-9 (PHQ-9; a score ≥ 10 indicating likely MDD; Kroenke et al., 2001), the Brief Resilience Scale (BRS; a score < 3 indicating low resilience; Smith et al., 2008), and the Perceived Stress Scale 10-item (PSS-10; PSS score ≥ 14 indicating moderate-to-high stress; Cohen et al., 1983). In addition, the scales were employed as continuous variables and the mean scores ascertained.

Ethical Approval

Ethical approval for the research was obtained through the University of Alberta Health Research Ethics Board (Pro00086163), with informed consent having been implied by completing and returning the survey.

Statistical Analysis

The data have been analyzed using SPSS Version 25 (IBM). Descriptive analyses were run for all study variables, including the sociodemographic variables, war-related items, and the prevalence of clinical conditions under study (i.e., low resilience, likely MDD, likely GAD, and moderate-to-high stress) against the sex of the respondents. To examine the association of psychological problems with the sociodemographic and war-related factors, univariate analyses using

a chi-squared test and Fisher’s exact test were performed with two-tailed significance ($p \leq .05$). If statistically significant differences are noted on the chi-squared test and Fisher’s exact test, the study plans to use binary logistic regression analyses to ascertain if independent associations exist between the war-related factors and the presence of clinically meaningful outcome measures while controlling for the sociodemographic factors. The study compares the severity of the four psychological problems (mean scores on the rating scales) between two groups of subscribers based on the respondents’ citizenship or having ancestors or family from Ukraine. The first group represents the participants who have no Ukrainian citizenship or ancestors from Ukraine (NUk), while the second group represents the respondents who are Ukrainian and either have previously held citizenship or have ancestors or family from Ukraine (Ukr). An independent samples t-test with two-tailed significance ($p \leq 0.05$) has been employed to assess the differences in the respective mean scores of the psychological problems across the two mentioned groups. No imputation of missing data is found, with the reported data representing the complete responses.

Results

Of the 222 subscribers, 81 responded to the survey, yielding a response rate of 36.5%. The analysis includes the 75 complete responses. Most respondents ($n = 43, 57.3%$) heard about the program from the news, including newspapers, online articles, and television. The rest of the subscribers heard about the program from the following sources: social media ($n = 11, 14.7%$), radio ($n = 8, 10.7%$), website (e.g., Alberta Health Services; $n = 7, 9.3%$), and other sources ($n = 9, 12%$). Demographically (see Table 1), most respondents are between 49-61 years of age ($n = 29, 38.7%$), white ($n = 68, 90.7%$), have completed postsecondary education ($n = 70, 93.3%$), are in a relationship ($n = 54, 72%$), are employed ($n = 51, 68%$), and own their home ($n = 56, 74.4%$). The sample includes 25 participants (33.3%) who reported being of Ukrainian descent (currently hold or have previously held citizenship, or have ancestors or family from Ukraine) and eight subscribers (10.7%) who reported having family or friends living in Ukraine. Only two subscribers (2.7%) reported having family or friends in Ukraine who had died from the war. Seven subscribers (9.3%) reported having family or friends who had to move out of Ukraine to neighboring countries because of the war there. Lastly, about three in 10 subscribers reported having been fearful for the lives of family or friends in Ukraine during the war ($n = 22, 29.3%$). No statistically significant differences were found between males and females with respect to any of the demographic or war-related variables.

Table 1.

Distributions for the Sociodemographic and War-Related Factors, as Well as Clinical Outcomes in Terms of Respondents’ Sex at Birth

Variables	Male <i>n</i> (%) <i>N</i> = 12	Female <i>n</i> (%) <i>N</i> = 63	Total <i>n</i> (%) <i>N</i> = 75	<i>p</i> value
Sociodemographic characteristics				
Age (Years)				
≤ 50	6 (50.0)	17 (27.0)	23 (30.7)	0.33*
50-60	3 (25.0)	26 (41.3)	29 (38.7)	
> 60	3 (25.0)	20 (31.7)	23 (30.7)	
Ethnicity				
White	11 (91.7)	57 (90.5)	68 (90.7)	1.0*
Other	1 (8.3)	6 (9.5)	7 (9.3)	
Educational level				
High school	1 (8.3)	4 (6.3)	5 (6.7)	1.0*
Postsecondary education	11 (91.7)	59 (93.7)	70 (93.3)	

Relationship status				
In a relationship	7 (58.3)	47 (74.6)	54 (72.0)	0.30*
Not in a relationship	5 (41.7)	16 (25.4)	21 (28.0)	
Employment status				
Employed	7 (58.3)	44 (69.8)	51 (68.0)	0.51*
Unemployed	5 (41.7)	19 (30.2)	24 (32.0)	
Housing status				
Owns home	8 (66.7)	48 (76.2)	56 (74.7)	0.31*
Rents	2 (16.7)	12 (19.0)	14 (18.7)	
Lives with family or friend	2 (16.7)	3 (4.8)	5 (6.7)	
Questions related to the war in Ukraine				
Are you or have you previously held citizenship or have ancestors/family from Ukraine or Russia?				
I am not and have never had citizenship or ancestors from either Ukraine	5 (41.7)	45 (71.4)	50 (66.7)	0.09*
I have/ had citizenship or ancestors from Ukraine	7 (58.3)	18 (28.6)	25 (33.3)	
I have/ had citizenship or ancestors from Russia	0 (0.00)	0 (0.00)	0 (0.00)	
Do you have family or friends living in Ukraine?				
No	10 (83.3)	57 (90.5)	67 (89.3)	0.61*
Yes	2 (16.7)	6 (9.5)	8 (10.7)	
Do you have family or friends in Ukraine who have died from the war in Ukraine?				
No	12 (100.0)	61 (96.8)	73 (97.3)	1.0*
Yes	0 (0.0)	2 (3.2)	2 (2.7)	
Do you have family or friends who have had to move out of Ukraine to neighboring countries because of the war in Ukraine?				
No	11 (91.7)	57 (90.5)	68 (90.7)	1.0*
Yes	1 (8.3)	6 (9.5)	7 (9.3)	
During the war in Ukraine, have you been fearful for the lives of any family or friends in Ukraine?				
No	9 (75.0)	44 (69.8)	53 (70.7)	1.0*
Yes	3 (25.0)	19 (30.2)	22 (29.3)	
Clinical Outcomes				

Resilience (BRS)				
High-to-normal resilience	8 (72.7)	21 (34.4)	29 (40.3)	0.02*
Low resilience	3 (27.3)	40 (65.6)	43 (59.7)	
MDD (PHQ-9)				
Unlikely	7 (63.6)	32 (52.5)	39 (54.2)	0.53
Likely	4 (36.4)	29 (47.5)	33 (45.8)	
GAD (GAD-7)				
Unlikely	10 (90.9)	34 (55.7)	44 (61.1)	0.04*
Likely	1 (9.1)	27 (44.3)	28 (38.9)	
Stress (PSS-10)				
Low stress	2 (18.2)	7 (11.5)	9 (12.5)	0.62*
Moderate-to-high stress	9 (81.8)	54 (88.5)	63 (87.5)	

* = Fisher’s exact value

Regarding the clinical outcomes, Table 1 indicates the female respondents to have a higher prevalence of the four psychological problems.

Table 2 represents the univariate analyses examining the association of the sociodemographic and war-related factors with the clinical outcomes. The analyses indicate the respondents who were identified as female to have a higher likelihood of presenting with low resilience ($\chi^2(1) = 5.68, p = .02$) and moderate-to-high anxiety ($\chi^2(1) = 4.85, p = .03$) compared to the male respondents. Similarly, the respondents in a relationship have a higher likelihood of presenting with moderate-to-high anxiety ($\chi^2(1) = 4.16, p = .04$). Otherwise, no significant association is found between the war-related factors and any of the outcomes of psychological problems.

Table 2

Association of the Sociodemographic and War-Related Factors With Psychological Problems (Chi²)

Variables	Low resilience		Likely MDD		Likely anxiety		Moderate-to-high stress	
	n (%)	p	n (%)	p	n (%)	p	n (%)	p
Sociodemographic characteristics								
Age (Years)								
≤ 50	13 (61.9)	.94	11 (52.4)	.77	10 (47.6)	.12	18 (85.7)	.99*
50-60	16 (57.1)		12 (42.9)		13 (46.4)		25 (89.3)	
> 60	14 (60.9)		10 (43.5)		5 (21.7)		20 (87.0)	
Sex at birth								
Male	3 (27.3)	.02	4 (36.4)	.49	1 (9.1)	.04	9 (81.8)	.54
Female	40 (65.6)		29 (47.5)		27 (44.3)		54 (88.5)	
Ethnicity								
White	39 (59.1)	.99*	30 (45.5)	.99*	24 (36.4)	.20*	57 (86.4)	.33
Other	4 (66.7)		3 (50.0)		4 (66.7)		6 (100.0)	

Educational level								
High school	3 (60.0)	.99*	0 (0.0)	.06*	1 (20.0)	.64*	4 (80.0)	.50
Postsecondary education	40 (59.7)		33 (49.3)		27 (40.3)		59 (88.1)	
Relationship status								
In a relationship	30 (57.7)	.57	21 (40.4)	.14	24 (46.2)	.04	45 (86.5)	.69
Not in a relationship	13 (65.0)		12 (60.0)		4 (20.0)		18 (90.0)	
Employment status								
Employed	27 (56.3)	.40	24 (50.0)	.32	20 (41.7)	.49	43 (89.6)	.45
Unemployed	16 (66.7)		9 (37.5)		8 (33.3)		20 (83.3)	
Housing status								
Owns home	29 (52.7)	.08*	22 (40.0)	.25*	22 (40.0)	.75*	48 (87.3)	.99*
Rents	10 (76.9)		8 (61.5)		4 (30.8)		11 (84.6)	
Lives with family or friend	4 (100.0)		3 (75.0)		2 (50.0)		4 (100.0)	
Questions related to the war in Ukraine								
Do you have or had previously held citizenship or have ancestors/ family from Ukraine?								
I do not and have never had citizenship or ancestors from Ukraine.	31 (66.0)	.14	23 (48.9)	.47	20 (42.6)	.38	40 (85.1)	.40
I have/ had citizenship or ancestors from Ukraine	12 (48.0)		10 (40.0)		8 (32.0)		23 (92.0)	
Do you have family or friends living in Ukraine?								
No	39 (60.9)	.71*	31 (48.4)	.28*	25 (39.1)	.99*	56 (87.5)	.99
Yes	4 (50.0)		2 (25.0)		3 (37.5)		7 (87.5)	
Do you have family or friends in Ukraine who have died from the war in Ukraine?								
No	42 (60.0)	.99*	32 (45.7)	.99*	27 (38.6)	.99*	61 (87.1)	.99*
Yes	1 (50.0)		1 (50.0)		1 (50.0)		2 (100.0)	
Do you have family or friends who have had to move out of Ukraine to neighboring countries because of the war in Ukraine?								
No	40 (61.5)	.43*	31 (47.7)	.44*	26 (40.0)	.70*	56 (86.2)	.29
Yes	3 (42.9)		2 (28.6)		2 (28.6)		7 (100.0)	
During the war in Ukraine, have you been fearful for the lives of any family or friends in Ukraine?								
No	29 (58.0)		24 (48.0)	.58	17 (34.0)	.20	43 (86.0)	.56
Yes	14 (63.6)	.65	9 (40.9)		11 (50.0)		20 (90.9)	

The severity of the four psychological problems (i.e., low resilience, likely GAD, likely MDD, and moderate to high stress) have also been compared between the two subscriber groups (i.e., NUK and Ukr) using the independent samples t-test.

Table 3.

Independent Samples t-Test Comparing Mean Scale Scores for Clinical Outcomes for NUkr and Ukr Subscribers

		<i>n</i>	Mean	<i>SD</i>	t	<i>p</i>	Mean Difference	95% Confidence interval
Low resilience	NUkr	47	2.71	.76709	1.43	.16	0.27	[-0.64, 0.11]
	Ukr	25	2.97	.73390				
Likely MDD	NUkr	47	10.06	5.881	.06	.95	0.10	[-3.14, 3.35)
	Ukr	25	9.96	7.732				
Likely GAD	NUkr	47	9.15	4.787	.04	.97	0.05	[-2.54, 2.43)
	Ukr	25	9.20	5.470				
Moderate-to-high stress	NUkr	47	21.43	7.246	.15	.88	0.27	[-3.17, 3.70]
	Ukr	25	21.17	.76709				

Table 3 demonstrates the results of the t-test, concluding that there was no statistically significant difference in the mean scores of the four psychological problems between the NUkr and Ukr subscribers ($p > .05$).

Discussion

This study has examined the mental health associations of the Russian invasion of Ukraine on Canadian subscribers from a supportive text message program designed specifically to address the psychological problems associated with the war. This study found the prevalence of low resilience, moderate to high stress, likely GAD, and likely MDD to be high in the respondents at 59.7%, 87.5%, 38.9%, and 45.8% respectively. As with previous study findings (Tugade & Fredrickson, 2004), the current study can infer that the effects of media exposure to disturbing scenes are associated with severe psychological distress. The high prevalence of psychological problems in a Canadian sample is consistent with results of one study that investigated the impact of the ongoing war in Ukraine on the mental health of Ukrainians and that found the participants who'd stayed in Ukraine to have significantly lower anxiety, depression, stress, and trauma-related symptoms compared to those who'd moved abroad (Kurapov et al., 2023). The impact of the COVID-19 pandemic may have also contributed to the high incidences of these psychological issues. A recent study (Obuobi-Donkor, Eboime, Shalaby, Agyapong, Oluwasina, et al., 2022) among the general public in Fort McMurray, Alberta reported a 45% prevalence of likely MDD, which is comparable to the prevalence reported here. Again, a prevalence of likely GAD was about 42.4% in other studies in Fort McMurray, which is higher than what was recorded in the current study (B. Agyapong et al., 2021; Owusu et al., 2022). In addition to the COVID-19 pandemic, however, this community had experienced previous traumatic events including wildfire and flooding. Contrarily, the present study reported a relatively higher prevalence of low resilience (59.7%) compared with the 37.4% recorded for participants in the Fort McMurray studies (Obuobi-Donkor, Eboime, Shalaby, Agyapong, Adu, et al., 2022). A systematic review (Xiong et al., 2020) of studies examining the mental health impact of the COVID-19 pandemic reported the highest prevalence for anxiety symptom at 50.9%, which is higher than what is reported in the current study. Nevertheless, comparable stress levels were reported among the general public in eight countries during the COVID-19 pandemic and the participants in this study (81.9% and 87.5%, respectively), which re-echoes the adverse mental health effects of war.

Compared to the male respondents, the respondents who identified as female had a higher likelihood of presenting with low resilience and GAD symptoms but not a higher likelihood of presenting with MDD symptoms or moderate-to-high stress. A similar study conducted among Ukrainians also showed women to have higher levels of anxiety, depression, and stress, while men showed higher levels of resilience than women. (Kurapov et al., 2023). This finding is unsurprising, as prior research on vicarious stress and gender differences regarding self-reported internalizing

symptoms has also shown females to tend to report more anxiety and less resilience than males. A systematic review (Charlson et al., 2019) reported exposure to armed conflicts to be connected with increased prevalence of mental health disorders such as anxiety disorders, post-traumatic stress disorder, and depression among women, even after the conflicts. Comparatively, the estimated prevalence of anxiety disorders among conflict-affected populations is two-to-four times as high as the global prevalence estimates, with women experiencing greater adverse mental health effects after exposure to conflict (Charlson et al., 2019).

One study (Sygit-Kowalkowska et al., 2017) of women who had experienced trauma reported both anxiety and depression to be predicted by one's level of personal coping skills and tolerance of negative emotions (resilience). This suggests the trauma these women experienced contributed to the development of low resilience and invariably increased their anxiety levels. For resilience to be evidenced, functioning or cognitive development would remain intact, as observed by recovery to adequate functioning or sustained adequate adaptation over adversity (Riley & Masten, 2005). Another study (Çetrez et al., 2021) reported resilience to be generally low among women compared to men. The low resilience among the females in the current study indicates recovery to have not been achieved, which may in part be due to the war still being ongoing or the possible lack of access to adequate social support and health services. This also highlights the fact that war disproportionately affects females (Charlson et al., 2019). Interestingly, another study also noted post-trauma resilience-recovery variables to be more prominent for women (King et al., 1999).

Being in a relationship has mostly been shown to be a protective factor against many psychiatric disorders, including suicidal ideation (Bertolote, 2020; Navaneelan, 2012). A study during the early stages of the COVID-19 pandemic also showed being in some kind of a relationship to mitigate the risk of developing symptoms of stress, anxiety, or depression (Nkire et al., 2021). Individuals in a relationship are considered to have increased social support, at least from their partners. Social support and immediate emotional response to trauma are important in predicting trauma-related psychopathology, with increased social support having been associated with reduced symptoms of PTSD, GAD, and depression (Neria et al., 2010). However, the current study shows contrary results, as respondents in a relationship have a higher likelihood of presenting with moderate-to-high anxiety. A potential explanation for this could be that individuals in relationships may have increased anxiety related to potential harm to their partners who may desire to travel to Ukraine to participate in the war and the effects this could have on their families. At the time of the survey, a call had gone out from the Ukrainian president encouraging men, including veterans, to join the military (Lister & Murphy, 2022), which had prompted foreigners, mostly men with no military experience, to volunteer to travel to Ukraine to fight (Mudge, 2022).

A high proportion of respondents in this study indicated being of Ukrainian descent or having some association with Ukraine and thus being directly or indirectly affected by the war. This may explain the low levels of resilience and high anxiety reported in the study. This notwithstanding, the study results also suggest no statistically significant differences to exist between Canadian residents with Ukrainian descent compared to those with no Ukrainian descent regarding the mental health impacts of the Russian invasion of Ukraine. This suggests that Russia's invasion of Ukraine may affect the mental health of all Canadians equally as a manifestation of the indirect effect of war on all populations, irrespective of any Ukrainian descent (Bhugra & van Ommeren, 2006). This study has also demonstrated that text messaging programs can be used as a means of assessing the mental health status of populations during times of war. In addition, daily supportive mobile text messages can provide an easily scalable, accessible, and cost-effective intervention to support the psychological well-being of residents (V. Agyapong et al., 2011; V. I. Agyapong et al., 2012; V. I. Agyapong et al., 2013; V. I. Agyapong et al., 2016; V. I. Agyapong et al., 2017; Hartnett et al., 2017). Supportive mobile text message interventions have been established to reduce stress, anxiety, and depression in subscribers of the Text4Hope program in Alberta, Canada during the COVID-19 pandemic (V. I. O. Agyapong, M. Hrabok, et al., 2021; V. I. O. Agyapong, Hrabok, Vuong, Gusnowski, et al., 2020; V. I. O. Agyapong, Hrabok, Vuong, Shalaby, et al., 2020; V. I. O. Agyapong, R. Shalaby, et al., 2021; Shalaby et al., 2021).

Implications for Policy and Practice

This study provides valuable insights into the mental health impact of the Russian invasion of Ukraine on a specific sample of Canadian residents who subscribed to the Text4Hope Ukraine text messaging program. This information is relevant when planning mental health interventions for this population. This study has also explored the potential differences in the mental health effects between Canadian residents of Ukrainian descent and those of non-Ukrainian descent and has confirmed the war to have had a negative effect on both populations. This knowledge is particularly applicable, because during a war outbreak, individuals who are not directly affected by the war may not be prioritized to receive mental health support. This study indicates that some residents of Canada may be indirectly affected by the Russian invasion of Ukraine and may require mental health support. The extensive media coverage has provided increasingly easy access to information through various avenues such as social networks and TV. The study provides a platform to appreciate the interconnectedness of the globalized world.

The current study helps to determine whether the war's emotional and psychological repercussions are being experienced uniformly across various segments of the Canadian population (i.e., those with Ukrainian origins and those without). This study adds to the literature on the diverse and complex ways in which conflicts are able to impact the mental well-being of a multicultural society such as Canada. This knowledge can help inform targeted interventions, support systems, and policies that provide specific needs to affected individuals and promote psychological resilience within these communities. The results from this study also support a more inclusive and empathetic response to the mental health challenges posed by the Russian invasion of Ukraine within the Canadian context.

Lastly, Text4Hope Ukraine was provided to all Canadians regardless of their ethnic origin, especially those who needed mental health support during the ongoing Russian invasion of Ukraine. Similar services are encouraged to be implemented with other healthcare institutions worldwide.

Limitations

This study is not without its limitations. Firstly, the scales used to assess mental health variables, although standardized, are not meant to be diagnostic. Secondly, the sample size is relatively small and may not represent the Canadian adult population, particularly Canadian residents of Ukrainian descent or with associations to Ukraine. The survey component of the Text4Hope Ukraine program was voluntary, and receiving daily messages was not contingent on completing the survey, which may have resulted in the low survey response rate. Notwithstanding the small sample size, the use of the appropriate statistical test for association, specifically, Fisher's exact test instead of the chi-squared test for cells with numbers less than 5, validates the study's findings, inferences, and the conclusions. Another limitation of this study is that the demographics of the study population do not represent the demographics of the adult population in Canada. Therefore, the study findings may not be generalizable to other target groups. Furthermore, the study did not assess or control for other current stressors (e.g., COVID-19, economic, familial, or social stressors), previous traumatic experiences (e.g., childhood sexual abuse, road traffic accidents, or military combat experience), or pre-existing psychological problems (e.g., anxiety or depressive disorders). Some of the psychological problems revealed in the respondents may not be associated with the Russian invasion of Ukraine but rather may be associated with other current stressors, previous traumatic experiences or pre-existing psychological problems. Notwithstanding these limitations, the current study provides vital insights into the potential association between the Russian invasion of Ukraine and the psychological problems present in residents of Canada.

Conclusion

War may indirectly affect all populations, irrespective of their location. The Russian invasion of Ukraine may have an effect on the psychological well-being of not only Ukrainians living in Ukraine but on others worldwide, including Canadian residents with or without Ukrainian associations. The indirect effect of the war in Ukraine may include increased stress, anxiety, and depression levels, as well as low resilience among the general population. Governments, policy-makers, and other health agencies should promote psychological health by providing targeted resources and support for the general population, including populations at risk during times of global conflict.

Conflict of Interest Disclosure

The authors have no financial or other conflicting interests.

Data Availability Statement

The data associated with this study are available upon reasonable request from the corresponding author.

Authors' Contributions

VIOA conceived and designed the study. BA drafted the initial manuscript, VIOA, RS, and BA conducted the data analyses. All authors contributed to the study design, revision of the initial draft manuscript, and approval of the final draft before submission.

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