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Navigating Uncertainty: the importance of mindfulness for the mental health of volunteer rescuers involved in the Ukrainian humanitarian emergency

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Abstract

Volunteer rescuers provide a crucial support to the population during emergencies. Previous literature demonstrated that the involvement in humanitarian crises, such as the one arising from Russia's invasion of Ukraine, exposes individuals to emotional and cognitive stressors, leading to detrimental effects on their mental health. Hence, it is of the utmost importance to identify factors that can shield them from developing adverse health-related outcomes. Accordingly, the aim of this study is to investigate whether mindfulness would be related to emotional exhaustion and post-traumatic stress and whether this relationship would be mediated by intolerance of uncertainty. A total of 210 volunteers engaged in the Ukrainian humanitarian crisis completed questionnaires measuring mindfulness, intolerance of uncertainty, emotional exhaustion, and post-traumatic stress. Mediation analyses revealed that mindfulness was negatively related to emotional exhaustion and post-traumatic stress, both directly and indirectly through the mediation of intolerance of uncertainty. By uncovering the protective role of mindfulness, this study makes a valuable contribution to the extant literature on the psychological well-being of volunteers. From a practical standpoint, volunteering associations should provide their volunteers with training, including mindfulness sessions, in addition to offering psychological support services and debriefing sessions following their involvement in emergencies.

Key words: Volunteer rescuers; Ukraine emergency; mindfulness; intolerance of uncertainty; mental health

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Introduction

The invasion of Ukraine by Russia and its associated socio-economic repercussions have deeply impacted a community that was still in the process of recovering from the aftermath of the Covid-19 pandemic (Darmayadi & Megits, 2023). The substantial influx of refugees, with over 7.5 million Ukrainians fleeing the country (Domaradzki et al., 2022), has given rise to a humanitarian crisis, prompting the mobilization of numerous rescuers and volunteers. However, engaging in humanitarian crisis poses risks to the psychological well-being of the staff (Strohmeier & Scholte, 2015). Indeed, a systematic review and meta-analysis of studies involving individuals working (either professionally or voluntarily) with refugees, asylum seekers, forced migrants, or displaced persons showed that they were at high risk of experiencing burnout and secondary traumatic stress (Roberts et al., 2021). More specifically, Pidbutska and colleagues (2023) demonstrated that individuals who volunteered in Ukraine during the war were vulnerable to the development of emotional exhaustion (i.e., the core dimension of burnout referring to feelings of being drained by one's job; Maslach & Leiter, 2016). This could be due to the prolonged exposure to intense emotional and cognitive stressors which can make rescuers susceptible to the development of adverse health-related outcomes, namely burnout symptoms (including emotional exhaustion; Sommovigo et al., 2022a) and post-traumatic stress (i.e., a reaction to a particularly stressful event manifested through symptoms of intrusion, avoidance, and hyperarousal; Setti & Argentero, 2016). However, although volunteers dedicate their efforts to several emotionally exhaustive tasks (Allen & Mueller, 2013), the literature on stress and emotional exhaustion among volunteers is still in its infancy (Allen & Augustin, 2021), especially for those who volunteered during the Ukraine war (Anjum et al., 2023).

Given the crucial role that volunteer rescuers play during humanitarian crises, it is of paramount importance to identify the factors that may protect them from developing detrimental health effects (Caricati et al., 2020). Among the different variables considered in the literature, mindfulness has been recognized as a personal resource that can aid individuals in effectively managing traumatic events (Fabbro et al., 2020). As such, it represents a potential protective factor for volunteers engaged in the Ukrainian emergency. Mindfulness has been defined as the personal capacity to maintain a state of full attention and awareness of the present moment in a non-judgmental way (Kabat-Zinn, 1994). Prior research has illustrated a wide array of positive effects associated with mindfulness. For instance, mindfulness was negatively related to emotional exhaustion among employees (Hülsheger et al., 2013) and first responders (McDonald et al., 2022). Additionally, the study conducted by Sos and colleagues (2023) demonstrated the effectiveness of mindfulness practices in reducing emotional exhaustion among healthcare professionals. Furthermore, mindfulness has been found to be negatively associated to healthcare professionals' psychopathological symptoms (Finistrella et al., 2023). Similarly, Setti and colleagues (2014) revealed a negative association between mindfulness and post-traumatic stress symptoms as well as psycho-physical distress in a sample of Italian firefighters. Additionally, a meta-analysis conducted by Fendel and colleagues (2020), which analysed 25 different studies, emphasized that mindfulness-focused interventions were protective factors for physicians and healthcare professionals against stress and burnout symptoms (including emotional exhaustion).

In addition to its positive impact on a wide range of health-related outcomes, mindfulness has shown statistically significant associations with individuals' predisposition to handle uncertain situations (Fan et al., 2023; Papenfuss et al., 2021; Kraemer et al., 2016). Notably, mindfulness has been identified as the most effective strategy for coping with intolerance of uncertainty (Sahib et al., 2023). At this regard, intolerance of uncertainty refers to an individual's tendency to view the possibility of a negative event occurring as unacceptable and threatening, regardless of the probability associated with it (Carleton et al., 2007). Intolerance of uncertainty has been found to be positively related to emotional exhaustion during emergency situations (e.g., Hung & Liu, 2022; Di Monte et al., 2020). In addition, a positive association has also been found between intolerance of uncertainty and post-traumatic stress (Celik et al., 2021).

Study aim and hypotheses

Although prior literature has shown that volunteers and, more broadly, first responders engaged in emergency situations are prone to experiencing various negative health-related outcomes, as far as our knowledge extends, no study has been undertaken to identify factors that may safeguard the psychological well-being of Italian volunteers involved in the

Fig. 1. Conceptual model regarding the relationships between mindfulness and ill-health symptoms (a. emotional exhaustion; b. post-traumatic stress) and the mediating role of intolerance of uncertainty while controlling for gender, type of association and service tenure.
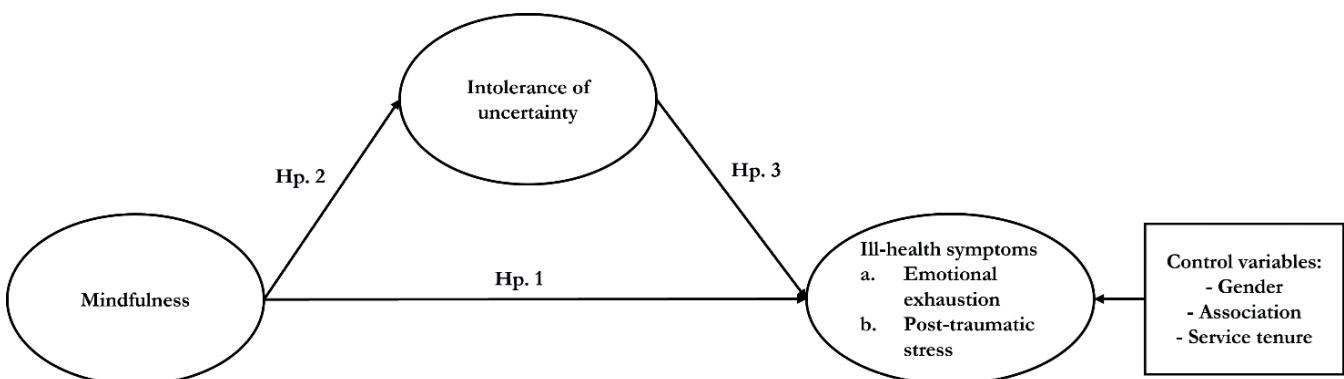
Ukrainian humanitarian crisis. Therefore, based on previous research, this study aims to address this gap by examining whether mindfulness could be related to emotional exhaustion and post-traumatic stress, both directly and indirectly through the mediation of intolerance of uncertainty. Accordingly, we developed the following hypotheses (Figure 1):

Hypothesis 1. Mindfulness will be negatively related to ill-health symptoms, as represented by emotional exhaustion (Hypothesis 1a) and post-traumatic stress (Hypothesis 1b).

Hypothesis 2. Mindfulness will be negatively associated with intolerance of uncertainty.

Hypothesis 3. Intolerance of uncertainty will mediate the association between mindfulness and ill-health symptoms, as represented by emotional exhaustion (Hypothesis 3a) and post-traumatic stress (Hypothesis 3b).

Methods

Participants and procedure

Participants were recruited from the rescuers affiliated with the Red Cross and Civil Defence associations located in different regions of Italy. Between June and August 2022, an online questionnaire was prepared and shared with the heads of each department who had previously expressed their willingness to collaborate in the research. Volunteer rescuers received an email from their department heads containing a link to complete the questionnaire. Participation in the study was open to all rescuers who had taken part in the rescue operations and management of the Ukrainian emergency. An information sheet describing the aim of the research and ensuring the voluntary nature of participation was attached at the beginning of the questionnaire. Participants were also assured about the anonymity and confidentiality of their responses. Informed consent was obtained from all survey participants.

The data collection was conducted in conformity with the Declaration of Helsinki and was approved by the Ethics Committee of the University of Pavia (Protocol no. 103/22).

A total of 210 volunteers rescuers involved in the Ukraine emergency completed the online questionnaire. The sample was equally distributed by gender, with 54.5% of man (Table 1). Most participants (70.1%) were affiliated with the Red Cross associations. The mean age of the sample was 49 years (SD=13.50) and the mean total service in the association was 11.74 years (SD=10.84).

Tab. 1. Characteristics of the sample (N=210)

Variable	%	M	SD
Gender			
Male	54.5		
Type of Association			
Red cross	70.1		
Civil defence	29.9		
Age		49	13.50
Overall job tenure		11.74	10.84

Note. M = Mean; SD = Standard Deviation.

Measures

In addition to socio-demographic variables (gender, age, service tenure, type of association), the following constructs were measured.

Mindfulness was assessed using the Italian version of the Mindful Attention Awareness Scale (MAAS; Setti et al., 2014). Respondents indicated how often they adopted mindless states described by each of the fourteen items (e.g., "*I snack without being aware of what I am eating*") on a 6-point Likert scale (1 = Almost always, 6 = Almost never; α = .89). Higher scores indicate a higher ability to adopt a mindful state.

Intolerance of Uncertainty was measured with the Italian version of the Intolerance of Uncertainty Scale-Revised (IUS-R; Bottesi et al., 2019). Participants indicated how much they agreed with each of the twelve items concerning their level of intolerance of uncertain events (e.g., "*It bothers me when there are things I don't know*") on a 5-point Likert scale (1 = completely disagree, 5 = completely agree; α = .85). Higher scores indicate higher intolerance of uncertainty.

Emotional exhaustion was evaluated using the eight-item scale from the Italian version of the Burnout Assessment Tool (BAT; Consiglio et al., 2021). Respondents indicated how frequently they suffered from emotional exhaustion symptoms (e.g., *During the service, I feel mentally exhausted*) on a 5-point Likert scale (1 = Never, 5 = Ever; α = .90). Higher scores indicated higher levels of emotional exhaustion. This study focuses on emotional exhaustion since previous research indicated that individuals who volunteered in Ukraine during the war were prone to experiencing symptoms of emotional exhaustion (Pidbutska et al., 2023). Moreover, emotional exhaustion is widely recognized as the core symptom of burnout, regardless of the theoretical framework and measurement scales adopted (e.g., Perinelli et al., 2023; Buono et al., 2023; Sommovigo et al., 2022b; Bosmans et al., 2019; Huynh et al., 2014; Taris et al., 2005).

Post-traumatic stress was assessed using the six-item Italian version of the Impact of Event Scale-Revised (IES; Giorgi et al., 2015). Participants indicated how frequently they experienced each symptom (i.e., intrusion, avoidance, and hyperarousal) from the beginning of the Ukraine emergency (e.g., "*I thought about it when I didn't mean to*") on a 4-point Likert scale (0 = Never, 4 = Often; α = .85).

Control variables

We controlled for gender (0=male; 1=female), type of associations (0=Red Cross; 1= Civil Defence), and service tenure (measured in years).

Statistical analyses

The data were analysed using SPSS 25.0. Firstly, we assessed the multicollinearity and normality of the data. Following the guidelines of Stevens (2002) and Tabachnick and Fidell (2001), no concern about multicollinearity were identified, as the highest variance inflation values was 1.06 and the lowest tolerance value was .94. Additionally, skewness (ranging from –1.22 to 0.98) and kurtosis (ranging from –0.64 to 1.86) values were within

acceptable limits (George & Mallery, 2010). Next, descriptive statistics, Cronbach's alpha and bivariate correlations among the study variables were calculated. Two distinct mediation models were tested using the Hayes's Process Macro for SPSS (Model 4; Hayes, 2018). The first model aimed to examine the mediation of intolerance of uncertainty in the relationship between mindfulness and emotional exhaustion, while the second model analysed the mediating role of intolerance of uncertainty in the association between mindfulness and post-traumatic stress. Based on 5000 bootstrap samples, indirect effects were estimated by checking whether 95% confidence intervals (CIs) included the value of 0. Finally, the Harman single factor test (Harman, 1976) was employed to assess the risk of Common Method Bias. The single factor explained 24.60% of the total variance, suggesting that Common Method Bias did not appear to be a significant issue in this study.

Results

Descriptive statistics

Mean, standard deviations and correlations for the study variables are presented in Table 2. Correlations among the study variables were statistically significant and in the expected directions. Additionally, Cronbach's alpha values for each construct were above the recommended threshold (DeVellis & Thorpe, 2016).

Models Testing

To assess the adequacy of our sample size, we performed a power analysis for a multiple regression analysis involving five predictors, utilizing the G*Power software (Faul et al., 2007). The outcome of this analysis, computed with a significance level of 0.05, a power of 0.95, and a medium effect size ($f2$= .15), demonstrated that a minimum of 89 participants was required. Additionally, a power analysis using Kenny's MedPower calculator (2017) indicated that 156 participants were required for detecting indirect effects (β = .25 for each path, α= .05 and desired power = .80), indicating that our sample size was appropriate.

To test the hypothesised relationships, two different mediation models were computed.

The results of the first model (see Table 3 and Figure 2a) indicated that mindfulness was statistically significantly associated with intolerance of uncertainty (β = -.22, *SE* = .06, *p* < .001, *95% CI: -.33; -.10*) and emotional exhaustion (β = -.30, *SE* = .06, *p* < .001, *95% CI: -.40; -.19*). Intolerance of uncertainty was statistically significantly related to emotional exhaustion (β = .23, *SE* = .07, *p* < .001, *95% CI: .10; .36*) and partially mediated the association between mindfulness and emotional exhaustion (β = -.05, *SE* = .02, *p* < .001, *95% CI: -.09; -.02*). Furthermore, being part of the Civil Defence statistically significantly correlated with emotional exhaustion (β = .26, *SE* = .10, *p* < .05, *95% CI: .07; .46*). These results confirmed Hypotheses 1a, 2, and 3a.

Tab. 2. Descriptive, internal consistencies and intercorrelations for study variables (N=210)

	M	SD	Skewness	Kurtosis	1	2	3	4	5	6	7
1. Mindfulness	4.81	.85	-1.22	1.86	**.89**						
2. Intolerance of uncertainty	2.37	.70	.60	-.02	-.25***	**.85**					
3. Emotional exhaustion	1.82	.73	.98	1.12	-.42***	.27***	**.90**				
4. Post-traumatic stress	1.06	.82	.48	-.64	-.26***	.52***	.39***	**.85**			
5. Service tenure	11.75	10.84	-	-	.12	-.05	.03	-.05	-		
6. Gender	-	-	-	-	-.15*	-.10	.09	.13	-.18*	-	
7. Association	-	-	-	-	-.04	-.06	.16*	-.04	.12	-.07	-

*Note. Boldfaced numbers on the diagonal represent Cronbach's alpha; M = means; SD = standard deviations; gender: 0 = male, 1 = female; Association: 0 = red cross, 1 = civil defence; *p < .05; **p < .01; ***p < .001.*

Tab. 3. Path coefficients for the mediation models having intolerance of uncertainty as mediator in the relationship between mindfulness and emotional exhaustion (Model 1)

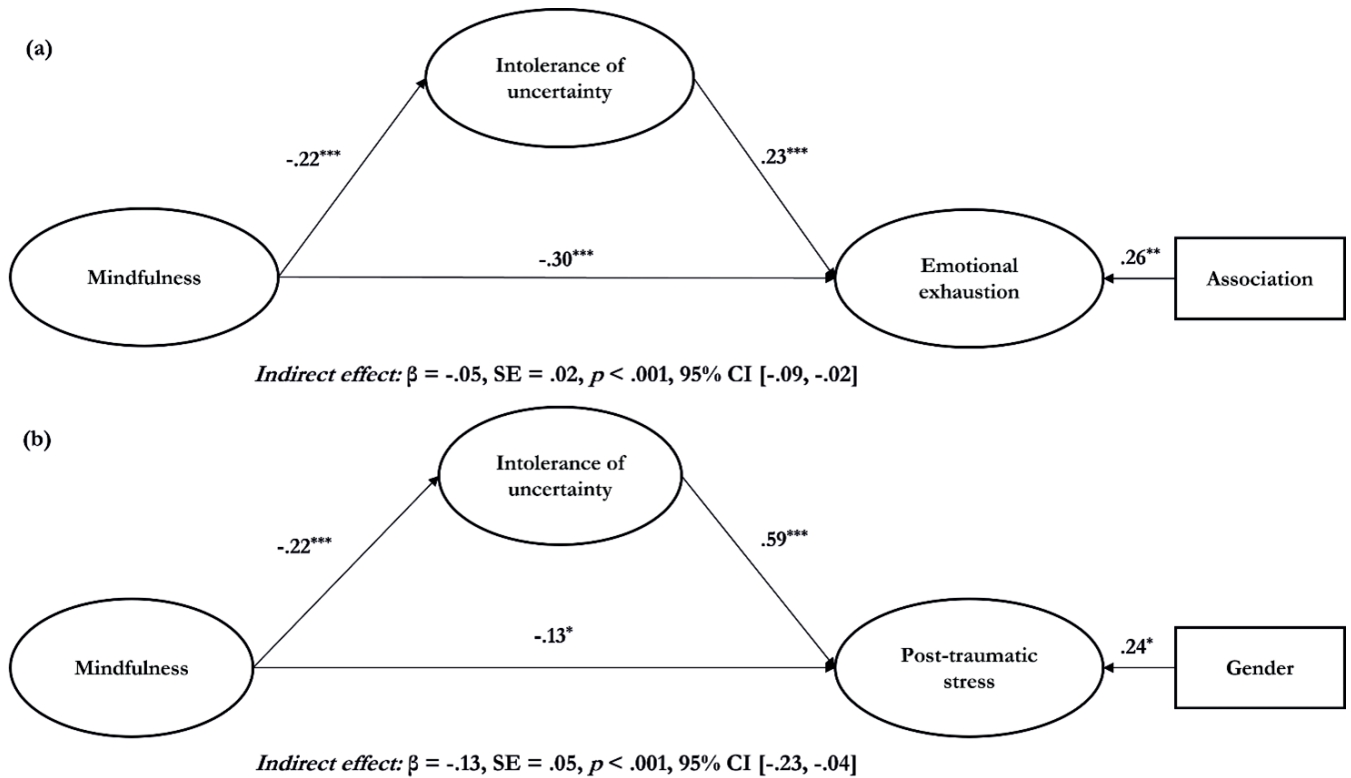| Dependent Variable	Predictor	B	S.E.	95% CI Lower bound	95% CI Upper bound
Intolerance of uncertainty					
	Mindfulness	-.22***	.06	-.33	-.10
	Gender	.18	.10	-.38	.01
	Tenure	-.00	.00	-.01	.00
	Type of association	-.13	.10	-.34	.08
Emotional exhaustion					
	Mindfulness	-.30***	.06	-.40	-.19
	Gender	.08	.09	-.11	.27
	Tenure	.00	.00	-.00	.01
	Type of association	.26**	.10	.07	.46
	Intolerance of uncertainty	.23***	.07	.10	.36
Total effect		-.35***	.06	-.46	-.24

*Note. B = Effect; S.E. = Standard Errors; 95% CI = bootstrapping lower and upper limit bias-corrected 95% confidence intervals. Gender: 0 = male, 1 = female; Association: 0 = red cross, 1 = civil defence; *p < .05; **p < .01; ***p < .001.*

The results of the second mediation model (see Table 4 and Figure 2b) suggested that mindfulness was statistically significantly associated with post-traumatic stress (β = -.13, *SE* = .06, *p* < .05, *95% CI: -.25; -.01*). Intolerance of uncertainty was statistically significantly related to post-traumatic stress (β = .59, *SE* = .07, *p* < .001, *95% CI: .45; .73*) and partially mediated the association between mindfulness and post-traumatic stress (β = -.13, *SE* = .05, *p* < .001, *95% CI: -.23, -.04*). Additionally, being female was statistically significantly correlated with post-traumatic stress (β = .24, *SE* = .10, *p* < .05, *95% CI: .04; .44*). These results confirmed Hypotheses 1b, and 3b.

Discussion

The current study examined the mediating role of intolerance of uncertainty in the association between mindfulness and both emotional exhaustion and post-traumatic stress among Italian volunteers involved in the Ukrainian humanitarian crisis. By underlining the protective role of mindfulness, our study contributed to enrich the literature on the psychological well-being of individuals volunteering during the Ukrainian humanitarian crisis. Our study revealed a statistically significant negative correlation between mindfulness and both emotional exhaustion and post-traumatic stress. Although, to the best

Fig. 2. Models analysing the mediating role of intolerance of uncertainty in the relationship between mindfulness and ill-health symptoms (a. emotional exhaustion; b. post-traumatic stress).

Indirect effect: β = -.05, SE = .02, *p* < .001, 95% CI [-.09, -.02]

Indirect effect: β = -.13, SE = .05, *p* < .001, 95% CI [-.23, -.04]

Tab. 4. Path coefficients for the mediation models having intolerance of uncertainty as mediator in the relationship between mindfulness and post-traumatic stress (Model 2)

Dependent Variable	*Predictor*	*B*	*S.E.*	95% CI Lower bound	95% CI Upper bound
Intolerance of uncertainty					
	Mindfulness	-.22***	.06	-.33	-.10
	Gender	.18	.10	-.38	.01
	Tenure	-.00	.00	-.01	.00
	Type of association	-.13	.10	-.34	.08
Post-traumatic stress					
	Mindfulness	-.13*	.06	-.25	-.01
	Gender	.24*	.10	.04	.44
	Tenure	-.00	.00	-.01	.01
	Type of association	-.01	.11	-.22	-.19
	Intolerance of uncertainty	.59***	.07	.45	.73
Total effect		-.26***	.07	-.39	-.13

*Note. B= Effect; S.E.= Standard Errors; 95% CI= bootstrapping lower and upper limit bias-corrected 95% confidence intervals. gender: 0=male, 1=female; Association: 0=red cross, 1= civil defence; *p<05; **p<.01; ***p<.001.*

of our knowledge, no previous study has specifically analysed these relationships among individuals volunteering during the Ukrainian humanitarian crisis, the relevance of mindfulness for the psychological well-being of individuals engaged in emergency situations has been demonstrated (e.g., McDonald et al., 2022; Setti et al., 2014; Finistrella et al., 2023). According to Garland and colleagues (2009), mindfulness fosters a specific form of metacognitive awareness that aids in distancing oneself from negative thoughts and engaging in positive reappraisal of stressful situations. By doing so, mindfulness can mitigate the tendency to catastrophize stressful events, enabling individuals to cultivate a heightened sense of control and thereby reducing the likelihood of negative reactions (Garland, 2007).

Consistent with previous findings (e.g., Fan et al., 2023; Papenfuss et al., 2021; Kraemer et al., 2016), our study demonstrated a statistically significant and negative association between mindfulness and intolerance of uncertainty, suggesting that volunteers with higher levels of mindfulness were more likely to tolerate and accept the threat that uncertain situations may occur. Mindfulness enhances the ability to adaptively regulate attention to the present, making individuals less prone to excessive worry about uncertain future events (Sahib et al., 2023; Kraemer et al., 2016). Additionally, mindful people are more able to accept events in a non-judgmental manner (Stuart-Edwards, 2023), promoting the development of positive thoughts and mitigating the impact of the negative ones (Simione et al., 2021).

Finally, our findings showed that intolerance of uncertainty mediated the associations between mindfulness and both emotional exhaustion and post-traumatic stress, suggesting that volunteers that were more able of adopting a mindful state were less likely to experience intolerance of uncertainty, thereby being less vulnerable to the development of emotional exhaustion and post-traumatic stress. This may occur as mindful individuals are more adept at objectively accepting all experiences – whether pleasant or stressful – without succumbing to excessive worries (Lindsay & Creswell, 2017). During the humanitarian crisis related to the Russian-Ukraine war, volunteers who were more proficient at observing their own emotions and thoughts in a non-judgmental way were likely better equipped to attain the mental distance necessary to re-examine the situation and potential actions (Good et al., 2016). This capacity may reduce the risk of overreaction (Bredemeier & Berenbaum, 2008) and enhance the ability to adopt behaviours beneficial for their mental health. In line with this, mindfulness may encourage the adoption of adaptive coping strategies instead of maladaptive ones (Keng & Tong, 2016), helping to mitigate volunteers' reactivity to potential stressors during the humanitarian crisis in Ukraine while simultaneously counteracting the potential negative impact of intolerance of uncertainty.

Limitations and Further Directions

This is a cross-sectional study relying on self-report measures only, raising concerns of common method bias. The unidimensional scale used to measure mindfulness limited us to discern potential differences between the different facets of mindfulness (e.g., Simione et al., 2021; Fan et al., 2023). Therefore, longitudinal studies collecting data from different sources of information and adopting a multidimensional measure of mindfulness, in addition to consider potential effects of moderating variables (e.g., coping strategies, social support) should be conducted.

Conclusions

The current study investigated the protective role of mindfulness among Italian volunteers involved in the humanitarian crisis in Ukraine by showing that volunteers who were more able to adopt a mindful state were less vulnerable to develop emotional exhaustion and post-traumatic stress symptoms, both directly and indirectly through the mediation of intolerance of uncertainty. In doing so, our findings enrich the existing literature by addressing a call for more research on the association between mindfulness and intolerance of uncertainty (Sahib et al., 2023). Additionally, this study provides valuable insights into how volunteering associations can practically support the psychological wellbeing of volunteers. In this regard, considering that mindfulness is a psychological characteristic that can be enhanced through targeted training (Garland et al., 2009), volunteering associations should offer training programs that include specific sessions and exercises aimed at fostering mindfulness among their volunteers. Additionally, to mitigate the levels of intolerance of uncertainty, volunteers should receive training on adaptive emotion regulation techniques (Sahib et al., 2023). Finally, a psychological support service along with debriefing sessions following the involvement in emergency situations should be provided.

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