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Prevalence and predictors of mental distress among Italian Red Cross auxiliary corps: A cross-sectional evaluation after deployment in anti-COVID-19 operations

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ABSTRACT

The aim of the present study is to describe the prevalence and individual predictors of mental distress (anxiety, depression, and burnout) in a sample of volunteers engaged in emergency services. A total of 823 volunteers enrolled in the Red Cross auxiliary corps were surveyed between 28 June 2021 and 28 August 2021 (299 men and 524 women). After deployment in anti-COVID-19 operations, participants completed the Patient Health Questionnaire, Generalized Anxiety Disorder Questionnaire, Maslach Burnout Inventory, and Big Five Inventory through an online platform. A moderately severe risk of depression was found in 1.70% of the sample. A severe risk for anxiety disorders was found in 1.82%. A high risk for emotional exhaustion was found in 3.40%, depersonalization in 12.88%, and low personal accomplishment in 7.53%. Women showed a higher risk of both depression and anxiety in comparison to males. Personality factors were significant predictors for all dimensions. In contrast to the current literature, openness was found to be a predisposing personality factor in developing burnout dimensions. The relevance of the current findings for the development of effective screening tools before the deployment of reserve forces during medical crises is discussed.

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Depression; anxiety; burnout; COVID-19; personality

What is the public significance of this article?—Mental distress after duty has interested civil servants involved in anti-COVID-19 operations (e.g., physicians, nurses). However, to the present day, the same level evidence for armed forces has not been proposed. The present study measured mental distress after deployment in a sample of volunteers enrolled in auxiliary corps, and evaluated individual predictors of worse outcome. Gender, age, and personality factors were found to be significant predictors of mental health outcomes.

Introduction

Italy was one of the first countries to be called into action against SARS-CoV-2 (Remuzzi & Remuzzi, 2020). Several demands were met by the high-quality healthcare system in a short period of time, but this system had been facing a number of challenges even before a pandemic (Armocida et al., 2020; GBD Italy Collaborators, 2019). Within the Italian public sector, a network of associations has supported the health-related needs of an aging population (De Lorenzo et al., 1999), due perhaps in part to the gradual reduction in financing for public healthcare (GBD Italy Collaborators, 2019). The last estimates, according to the Italian Institute of Statistics, evaluated that 350,492 individual NGOs were currently operating in Italy (ISTAT, 2019). While most NGO activities are usually carried out by volunteers, a portion of the service they provide is also implemented by hired volunteers, which leads to the mixed status of service advocates and waged employees within these organizations. According to the same report, a total of 844,775 individuals had mixed volunteer-employee status in Italy during 2017, representing between 7.0% and 8.0% of the total national workforce (ISTAT, 2019). In particular, approximately 22.0% of these workers (184,594 volunteers/employees) were engaged in healthcare or health-promoting services (ISTAT, 2019). A prominent role in the above-mentioned network of associations is occupied by the "International Red Cross and Red Crescent Movement" and its Italian association (Rocca, 2021), which includes the Red Cross auxiliary and voluntary military corps (Carini et al., 2005; Valsecchi et al., 2019).

In its organization, the Italian Red Cross includes two auxiliary corps as reserve forces in support of Italian defense services (including but not limited to the

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national army, navy, and aviation services). The male-only component is currently composed of around 20,000 reserve members (*Corpo Militare Volontario CRI – Croce Rossa Italiana*, n.d.), while the female-only component consists of around 10,000 reserve members (*Corpo Infermiere Volontarie CRI – Croce Rossa Italiana*, n.d.). Historically, both have been associated with health aid during military operations (Calzolari, 2021). In the past, the corps had been deployed as active participants in war theaters (Giacomello & Magnani, 1993), provided aid during natural disasters, and conducted public health surveillance during general medical crises (Cabigiosu, 2005). The Red Cross auxiliary corps have been present for all major emergencies in the Italian national territory since 1864. The auxiliary corps mainly employ healthcare personnel, such as physicians, nurses, nurses' assistants, paramedics, and psychologists, but a fundamental role is also occupied by logistics personnel and administrators.

A careful evaluation of the resources needed to achieve effective deployment during public health crises may benefit from a consideration of the recent literature on the topic of mental correlates after service in the military and volunteering personnel. For instance, Argentero et al. (2006) showed that volunteers engaged in service during emergencies had higher scores on measures of depersonalization than volunteers involved in routine occupations. Moreover, a younger age and shorter length of work experience were associated with lower values on personal accomplishment measures among active personnel (Chirico, Chirico, Crescenzo et al., 2021; Crescenzo, Chirico et al., 2021; Crescenzo, Marciano et al., 2021; Di Trani et al., 2021). In addition, reserve forces after deployment exhibited higher levels of distress, particularly in association with differences in gender and work experience (Harris et al., 2014; Vanneman et al., 2017).

Military personnel were widely employed around the world in response to COVID-19 (Kalkman, 2021), with activities ranging from enforcing social distancing or lockdown orders (Barreau, 2021; Ebrahim et al., 2020), to fostering civil-military collaborations in support of early detection, tracing, and treatment (Bacchus et al., 2021; Pasquier et al., 2021). The military sector has offered a critical contribution to the early phases of COVID-19 mitigation, for instance, by building and assisting in the operations of field hospitals in affected countries such as France, Italy and the United States (Arango, 2020; Bartovská et al., 2020; Baughman et al., 2020; Danguy Des Déserts et al., 2020; Marolleau et al., 2020; Opillard et al., 2020). This specific occupational exposure seems to have elevated mental distress levels among military personnel to rates similar to those observed in civilian healthcare (Costea et al., 2021; Gómez-Galán et al., 2020; Gupta et al., 2020; Lázaro-Pérez et al., 2020; Pan et al., 2020; Slama et al., 2021). The complex interplay between personality factors, stressors, and stress has not been completely elucidated in this population; a major prospect for doing so seems to lie in the construction and validation of screening tools to be used in the selection, screening, and placement of aspiring volunteers (Sartori et al., 2014). For the purpose of the present study, personality has been defined in accordance with the work of Cattell (1943) as a trait-based approach to those behavioral and motivational predictors that tend to be stable at the individual level, which explains part of the variability in the psychological interactions between the individual person and their environment (Deary, 2009). In expanding trait-based approaches, maladaptive responses, such as pathological anxiety, depression, and burnout, seem to be divergent reactions to the different stresses and stressors faced, while also being inter-mutually independent constructs (Koutsimani et al., 2019).

According to the Diagnostic and Statistical Manual of mental disorders, 5-th edition (DSM-5) anxiety disorders are defined as those conditions that share the common feature of excessive fear and anxiety which and are associated with behavioral disturbances (American Psychiatric Association, 2013). In particular, the DSM-5 defines fear as the emotional response to real or imaginary threats, while anxiety is defined as the anticipation of future threats (American Psychiatric Association, 2013). Depressive disorders have been defined as disrupted mood disorders (APA, 2013). The common feature of "depression" – or depressive disorders – is the presence of a sad, empty, or irritable mood, which is accompanied by specific somatic or cognitive complaints and a significant reduction in the capacity to function (APA, 2013). According to the International Classification of Diseases 11th Revision (ICD-11), in contrast to the DSM-5, burnout is a complex, multifaceted, and occupational-related syndrome, which is conceptualized as resulting from the imbalance between coping factors and chronic stress exposure (WHO, 2018). In full concordance with the theoretical model postulated by Maslach and Jackson (1981), the ICD-11 defines burnout syndrome as characterized by three dimensions: feelings of exhaustion; feelings of negativity or cynicism related to one's job; and a sense of ineffectiveness or a lack of accomplishment. The interaction between depression, anxiety, and burnout has not yet been fully described. In fact, depression seems to be correlated with higher distress in the form of emotional exhaustion, while anxiety seems to be associated with lower feelings of personal accomplishment (Bianchi &

Schonfeld, 2016; Golonka et al., 2019). In conclusion, definite and directed causality has not yet been defined between these three conditions. In other words, stress is posited to have a complex interplay with individual factors, from which surface anxious/depressive/burnout symptoms may or may not arise – all of which are taxing on the quality of life of individuals.

In terms of COVID-19, several studies have observed a higher burden of distress in the general population following the conditions of the pandemic (Ibar et al., 2021; Luceño-Moreno et al., 2020; Miguel-Puga et al., 2021; Rossi et al., 2020; Ruiz-Fernández et al., 2020). However, healthcare workers exhibited a higher risk of experiencing anxious or depressive symptoms after the onset of COVID-19, as well as a higher risk of burnout (Lai et al., 2020; Pappa et al., 2021; Sunjaya et al., 2021). The recent literature has also demonstrated that multiple factors mediated and moderated the mental distress experienced during and after COVID-19 (Castellini et al., 2020; Crescenzo, Marciano et al., 2021; Pappa et al., 2021; Raudenská et al., 2020; Di Trani et al., 2021), including the role of occupational factors in eliciting burnout symptoms. Of particular relevance are the organizational risk factors associated with burnout during COVID-19, such as limited access to structural and professional resources (Joshi & Sharma, 2020), threats of viral contagion (Di Giuseppe et al., 2021; Kannampallil et al., 2020), disturbances in work-life balance (Dyal et al., 2022; Kancherla et al., 2020), higher administrative burdens (Laboe et al., 2021), and the absence of clear sanitary guidelines (Dagens et al., 2020).

In light of the above-mentioned occupational factors, COVID-19 can be said to represent a scenario of chronic exposure to specific health and job-related stressors. Thus, the aim of the present study was to investigate the construct of burnout syndrome, not by considering the specificity of the stressor, but by examining the role of predisposing factors in the distinct population of healthcare providers in a military setting. The theoretical framework supporting the present research was based on recent articles and reviews published in the field (Chirico, Afolabi et al., 2021; Gruber et al., 2021; Kotoulas et al., 2021). The interaction between stress and individual factors was hypothesized to significantly mediate the psychological sequelae experienced after deployment, so that individuals exposed to similar occupational circumstances would exhibit a heterogenous manifestation of mental distress as a function of personal predispositions. In particular, age, gender, and personality characteristics were posited to significantly predict the psychological sequelae observed in military personnel after deployment in anti-COVID-19 operations (Antonovsky et al., 2021; Crescenzo, Chirico et al., 2021; Crescenzo, Marciano et al., 2021; Di Giuseppe et al., 2021; Gruber et al., 2021; Luceño-Moreno et al., 2020; Pappa et al., 2021). The institutional role of mental health professionals warrants the responsibility of developing tools apt to elucidate and screen for predisposing factors while also employing targeted interventions to restore the general well-being of individuals called into service. While physicians and psychologists are generally called upon by vocational oath to restore the general well-being of individuals, their institutional role in specific organizations, such as the military corps, promotes a more active interest in both prevention and treatment, as restoring the health of volunteers minimizes drop-out rates and maximizes the provision of essential services to the community. A prospective theoretical model, inclusive of the posited implications for practice, is illustrated in Figure 1 by a graphical summary.

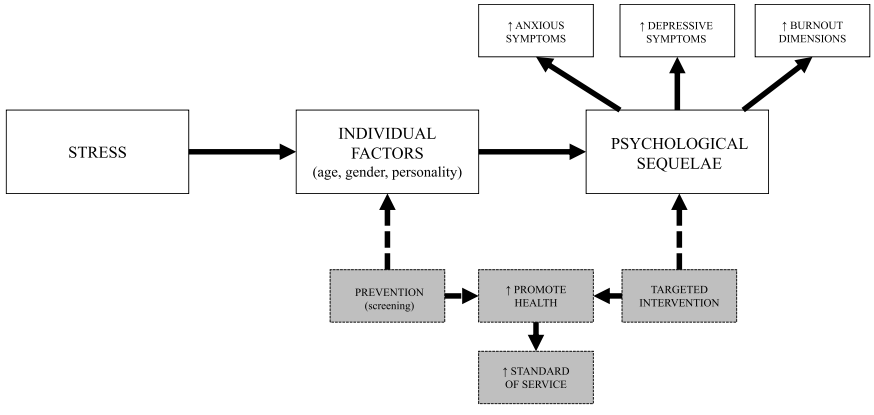

Figure 1. Theoretical basis of the present study. Both practitioners and institutions have an active interest in elucidating the role of individual predisposing factors, as well as in developing early targeted interventions aimed at treating volunteers in need. Institutions may minimize drop-out rates and maximize both the quality and quantity of services to the community in essential sectors, such as healthcare.

Aims

The primary aim of the study was to evaluate the cross-sectional risk of psychopathology in a dimensional manner for a sample of volunteers employed in auxiliary corps and recalled to duty for employment in COVID-19-related activities.

The secondary aim of this study was to evaluate linear models that elucidate the role of predictors in the development of mental distress after deployment.

Materials & methods

Participants

The sample was composed of volunteers drafted into the auxiliary corps of the Italian Army in reserve forces deployed in support of activities against COVID-19. The auxiliary personnel enrolled in the observations were formally recruited into either the Italian Red Cross voluntary military corps (CMVCRI) or the Italian Red Cross corps of voluntary nurses (IIVV). Formal recruitment consisted of a preliminary medical evaluation and an administrative audit (e.g., above 18 years old, no pending legal suits, or no other current military obligations). A total of 1082 individual observations were collected between 28 June 2021 and 28 August 2021 (357 CMVCRI, 725 IIVV). Of these observations, 823 were retained after the application of inclusion and exclusion criteria (i.e., active participation in anti-COVID-19 operations, minimum of seven days of service, and an age less than 65 years old; 299 CMVCRI; 524 IIVV).

Survey

An online survey was proposed to the administrative directors of the above mentioned auxiliary corps. After approval, the authors contacted each designated deployment center to reach individual members employed during COVID-19 service. The survey was composed of the following validated and translated questionnaires: the Generalized Anxiety Disorder Assessment (GAD) as a dimensional measurement of anxiety (Newman et al., 2002); the Patient Health Questionnaire (PHQ) as a dimensional measurement of depression (Kroenke et al., 2009); the Maslach Burnout Inventory (MBI) as a dimensional measure of burnout symptomatology (Pisanti et al., 2013; Sirigatti & Stefanile, 1993); and the Big Five Inventory, a 10 item dimensional measurement of personality factors (Guido et al., 2015). All questions had to be answered for the survey to be submitted. Furthermore, information on age and duration of service was also collected during the survey.

Instruments and measurements

An ad-hoc questionnaire was formulated to collect the following variables: age, duration of service, period of service (months in deployment), and role carried out.

Generalized Anxiety Disorder Assessment (GAD-7)

The GAD-7 is a validated instrument for evaluating the cross-sectional risk for generalized anxiety disorder in a dimensional manner (Spitzer et al., 2006). The questionnaire is composed of seven items, each of which asks the participant to indicate the frequency of the disturbance described. The questionnaire is scored on a four-point Likert scale (from "never" to "almost every day").

Patient Health Questionnaire (PHQ-8)

The PHQ-8 is a validated instrument for the cross-sectional measurement of depression risk in a dimensional manner. The questionnaire is composed of eight items measured along a four-point Likert scale. The participant was asked to indicate the frequency at which the disturbance identified was experienced for each item, ranging from "never" to "almost every day" (Kroenke et al., 2010, 2009; Shin et al., 2019; Wu et al., 2020).

Maslach Burnout Inventory (MBI-22)

The MBI (Maslach & Jackson, 1981; Sirigatti & Stefanile, 1993) consists of 22 items, for which the respondent is asked to evaluate how often a given event occurs using a seven-point Likert scale (ranging from "never" to "every day"). The instrument considers burnout to be a multi-faceted syndrome assessed by three main dimensions: emotional exhaustion (EE; Cronbach's alpha = .088), depersonalization (DP; Cronbach's alpha = .070), and personal accomplishment (PA; Cronbach's alpha = .083). The ranges for determining burnout severity levels for the Italian validation of the MBI questionnaire were established as follows: high EE $\geq$ 24, DP $\geq$ 9, PA $\geq$ 37; average EE = 15–23, DP = 4–8, PA = 30–36; and low EE $\leq$ 14, DP $\leq$ 3, PA $\leq$ 29 (Sirigatti & Stefanile, 1993). High scores on the EE and DP scales indicate a condition of emotional exhaustion and depersonalization, respectively, while high scores on the RP scale indicate a positive consideration of one's personal accomplishment.

Big Five Inventory short form (BFI-10)

The short form of the BFI, consisting of 10 items as proposed by Rammstedt and John (2007) and later validated in Italian (Guido et al., 2015), was designed to

assess the Big Five Inventory in a conveniently short period of time. Two items with contrasting phrasings are associated with each specific dimension (e.g., for the extroversion dimension, the two elements are "conventional, not creative" compared to "open to new experiences, complex"). The items are evaluated on a seven-point Likert scale, with responses ranging from "strongly disagree" to "strongly agree." The instrument evaluates the following five personality traits (Guido et al., 2015): agreeableness (AG; Cronbach's alpha item 2 = .51; item 7 = .71); conscientiousness (CO; Cronbach's alpha item 3 = .56; item 8 = .65); emotional stability/neuroticism (NE; Cronbach's alpha item 4 = .67; item 9 =.72); extroversion (EX; Cronbach's alpha item 1 = .60; item 6 = .77); and openness (OP; Cronbach's alpha item 5 = .56; item 10 = .57).

Statistical methods

Average scores and standard deviations were reported for each dimension evaluated by the above-mentioned validated questionnaires. Cutoff values were applied based on the reported values for each questionnaire. Group differences were evaluated by Hedges' *g* for effect size and the Mann–Whitney *U* test for statistical significance, as scores obtained from screening questionnaires are usually positively skewed, and thus normality was not assumed. Linear models were computed to evaluate the role of predictors in the development of mental distress after service. These models include personality and individual factors (e.g., age and duration of service). As the literature described in the introduction showed a directional role for anxious and depressive symptoms in burnout, linear models predicting burnout dimensions also included anxiety (GAD) and depression (PHQ), along with individual factors. Linear models were evaluated in a stepwise fashion to select the most informative factors.

Results

Descriptive statistics are reported in Table 1. The sample of voluntary nurses had a higher prevalence of women with at least a bachelor's degree. This might, in fact, reflect the history and role of this particular reserve force, as nursing studies typically involve a bachelor's degree or higher in Italy.

Primary results

The average results for the scores obtained from the questionnaires are reported in Table 2. A moderately severe risk of depression was found in 1.70% of the total sample (2.01% CMVCRI, 1.53% IIVV). A severe risk for anxiety disorders, as assessed by the GAD, was found in 1.82% of the sample (2.01% CMVCRI, 1.72% IIVV). Women exhibited a statistically significant elevation in the risk of both depression and anxiety in comparison to men (depression: Hedges' $g = -0.161$, $p = .003$; anxiety: Hedges' $g = -0.130$, $p = .012$).

Table 1. Descriptive statistics.

	CMVCRI	IIVV	Total
N	299	524	823
Age (years old)	46.41 (±12.03)	51.08 (±9.62)	49.39 (±10.79)
Service Duration (days)	33.50 (±29.99)	35.95 (±32.75)	35.06 (±31.78)
Educational Level (highest obtained)	Middle School 10.7% High School 53.5% Bachelor's Degree 10.7% Master's Degree 20.7% Ph.D. 4.3%	Middle School 9.2% High School 52.9% Bachelor's Degree 16.8% Master's Degree 17.9% Ph.D. 3.2%	Middle School 9.7% High School 53.1% Bachelor's Degree 14.6% Master's Degree 19% Ph.D. 3.6%
Occupation	Employee 65% Self-employed 17% Unemployed 7.3% Student 3.7% Retired 7%	Employee 61.6% Self-employed 13% Unemployed 11.5% Student 2.9% Retired 11.1%	Employee 62.8% Self-employed 14.5% Unemployed 10% Student 3% Retired 9.6%
Relationship Status	Single 25.1% Dating 14% Domestic Partner 11.7% Married 42.5% Divorced 6.3% Widower 0.3%	Single 18.1% Dating 6.7% Domestic Partner 8.2% Married 48.9% Divorced 14.4% Widower 3.8%	Single 20.7% Dating 9.4% Domestic Partner 9.5% Married 46.5% Divorced 5.3% Widower 2.6%

Note: ± Standard Deviation.
CMVCRI = male-only Italian Red Cross Voluntary Military Corps.
IIVV = female-only Italian Red Cross Corps of Voluntary Nurses.

Table 2. Average scores at survey.

	CMVCRI	IIVV	Total	Group Differences
PHQ	3.63 (±3.49)	4.17 (±3.48)	3.93 (±3.48)	g −0.161 (p 0.003*)
GAD	3.30 (±3.55)	3.77 (±3.50)	3.56 (±3.50)	g −0.130 (p 0.012*)
MBI-EE	10.08 (±9.22)	9.43 (±7.14)	9.66 (±7.92)	g 0.076 (p 0.427)
MBI-DP	6.12 (±5.35)	5.35 (±4.41)	5.65 (±4.77)	g 0.156 (p 0.228)
MBI-PA	27.126 (±10.46)	25.35 (±11.29)	26.08 (±11.04)	g 0.148 (p 0.073)

Note: *Higher risk of depression and anxiety were observed in the female-only Auxiliary Corp. Group differences estimated by Mann-Whitney U Test, effect size by Hedges' g. * visually marks significantly different dimensions between groups (p <0.05).*
CMVCRI = male-only Italian Red Cross Voluntary Military Corps.
IIVV = female-only Italian Red Cross Corps of Voluntary Nurses.
PHQ = Patient Health Questionnaire.
GAD = Generalized Anxiety Disorder Assessment Questionnaire.
MBI = Maslach Burnout Inventory; EE Emotional Exhaustion; DP depersonalization; PA personal accomplishment.

Table 3. Prevalence of psychopathology risk.

	CMVCRI	IIVV	Total
PHQ minimal risk	70.57%	60.88%	64.39%
PHQ mild risk	22.74%	32.63%	29.04%
PHQ moderate risk	4.68%	4.77%	4.73%
PHQ moderately severe risk	2.01%	1.53%	1.70%
GAD minimal risk	73.24%	65.65%	68.40%
GAD mild risk	20.74%	27.72%	25.27%
GAD moderate risk	4.01%	4.58%	4.37%
GAD severe risk	2.01%	1.72%	1.82%
MBI-EE low risk	84.95%	90.46%	88.46%
MBI-EE moderate risk	9.36%	7.5%	8.02%
MBI-EE high risk	5.68%	2.10%	3.40%
MBI-DP low risk	51.51%	56.30%	54.56%
MBI-DP moderate risk	32.78%	32.25%	32.44%
MBI-DP high risk	15.72%	11.26%	12.88%
MBI-PA low risk	77.93%	78.44%	78.25%
MBI-PA moderate risk	14.05%	15.84%	15.19%
MBI-PA high risk	10.03%	6.11%	7.53%

Note: *CMVCRI = male-only Italian Red Cross Voluntary Military Corps.*
IIVV = female-only Italian Red Cross Corps of Voluntary Nurses.
PHQ = Patient Health Questionnaire.
GAD = Generalized Anxiety Disorder Assessment Questionnaire.
MBI = Maslach Burnout Inventory; EE Emotional Exhaustion; DP depersonalization; PA personal accomplishment.

For the burnout dimensions, a high risk of emotional exhaustion was found in 3.40% of the total sample. A high risk for depersonalization was found in 12.88% of the total sample, and a high risk for low personal accomplishment was found in 7.53%. Further details are provided in Table 3.

Secondary results

Personality factors were significant predictors for all dimensions. In particular, openness was positively associated with all domains (i.e., depression, anxiety, emotional exhaustion, depersonalization, and personal accomplishment). Emotional stability was negatively associated with depression and anxiety, while it was positively associated with depersonalization and personal accomplishment. Emotional stability was not a significant predictor of emotional exhaustion. Anxiety and depression levels were associated with all burnout dimensions, apart from personal accomplishment (indicating a predisposition for both emotional exhaustion and depersonalization). Extroversion was positively associated with anxiety levels, while consciousness was associated with emotional exhaustion and personal accomplishment. Agreeableness was not found to be significantly associated with any dimension. Further details can be found in Table 4.

Discussion

The present study provided solid estimates for the prevalence of risk in the mental health dimensions for the included population. Women exhibited a statistically significant elevation in the risk of both depression and anxiety compared to men. Moreover, the results corroborated previous findings regarding the role of personality factors in their association with validated scores of psychopathology (Alarcon et al., 2009; Swider & Zimmerman, 2010). In accordance with the previous literature, depression seemed to be positively associated with higher levels of emotional exhaustion (Golonka et al., 2019), but a predisposing role for depersonalization was also noted. Conversely, in contrast to the previous literature, anxiety was not found to be negatively associated with personal accomplishment (Golonka et al., 2019). However, anxiety levels were positively associated with emotional exhaustion and depersonalization. Of particular interest is the finding that emotional stability (or neuroticism) was positively associated with both emotional exhaustion and depersonalization, while it was negatively associated with depression and anxiety. As the previous literature found contrasting results, emotional stability could be understood as a protective mediator for either anxiety or depression, rather than directly predisposing an individual toward burnout (Kyron et al., 2021; Mason et al., 2020).

Age was not positively associated with anxiety, depression, or burnout. This finding is in contrast to those in the recent literature, where age was reported to be a protective factor against burnout (Alacacioglu et al., 2009; Brewer & Shapard, 2004), anxiety, and depression (Calling et al., 2017; Losada-Baltar et al., 2020; NwachukNwachukwu et al., 2020; Solomou & Constantinidou, 2020). As previous research highlighted a protective role for experience in the development of burnout (Alacacioglu et al., 2009; Brewer & Shapard, 2004; Sanfilippo et al., 2017), in light of the observational nature during a novel emergency of the present study, the authors posit a role for specific rather than general occupational experience as a protective factor against burnout. In other words, rather than having an absolute protective effect, experience might defend against the development of burnout in the case of a specific sense of self-efficacy related to a particular objective, emergency, or condition that the individual is called to assist with. In contrast, a general occupational experience might actually offer an illusion of competence and potentially worsen the discrepancy between perceived work efficacy and actual results.

Emotional stability has been shown to have a protective role against anxiety and depression in the present study, while it was also revealed to be a predisposing factor for depersonalization. The protective role of emotional stability for depression and anxiety seems supported by previous literature (Bunevicius et al., 2008; Milić et al., 2019).

Table 4. Risk predictors.

Depression	Anxiety	Emotional Exhaustion	Depersonalization	Personal Accomplishment
Emotional Stability (β −0.267, p-value <0.001)	Emotional Stability (β −0.341, p-value <0.001)	GAD (β 0.318, p-value <0.001)	PHQ (β 0.226, p-value <0.001)	Conscientiousness (β 0.272, p-value <0.001)
Openness (β 0.132, p-value <0.001)	Openness (β 0.154, p-value <0.001)	PHQ (β 0.259, p-value <0.001)	Openness (β 0.119, p-value <0.001)	Emotional Stability (β 0.198, p-value <0.001)
	Extroversion (β 0.087, p-value 0.018)	Openness (β 0.079, p-value 0.013)	GAD (β 0.217, p-value <0.001)	Openness (β 0.080, p-value 0.020)
		Conscientiousness (β 0.064, p-value 0.044)	Emotional Stability (β 0.134, p-value <0.001)	

Note: *β represented Standardized coefficients in stepwise Linear Models.*

Similarly, dissociation and depersonalization have long been hypothesized as defense mechanisms, which can lie on a spectrum from normal to pathological (Loewenstein, 2018). Depersonalization can therefore be a possible maladaptive coping mechanism, that emphasizes the detachment from the self and others as a response to stressors (Schweden et al., 2018; Thomson & Jaque, 2018). The current study offers early evidence for an interplay between personality factors (i.e. emotional stability) and defense mechanisms (i.e. depersonalization), while also highlighting the need for future research on the topic. In particular, a longitudinal study on the interaction between coping mechanisms and personal factors in the development of burnout seems warranted, and could further elucidate the causal relationship between the two.

Openness was found to be a predisposing factor for increased risk across all the investigated psychopathological domains. This result is in contrast with a previous meta-analysis, which was performed on a large body of literature, and which found openness not to be significantly associated with mental well-being (Malouff et al., 2005), or only significantly associated with mental well-being by a small and positive effect size. Openness has been previously characterized as a higher propensity for self-altering experiences (Tellegen & Atkinson, 1974), as well as a higher experiential permeability (Piedmont et al., 2012). However, the exact composition of traits that defines openness has been the subject of scientific discussion (Van Allen & Zelenski, 2018). Openness is commonly conceptualized as composed of six facets, namely: productive imagination, aesthetic sensibility, emotional awareness, desire for variety, intellectual inquisitiveness, and aversion for authority (Van Allen & Zelenski, 2018). Nonetheless, a high degree of openness might also be interpreted as a propensity to decrease one's distance to others as a consequence of a higher degree of empathy (Costa et al., 2014; Guilera et al., 2019; Magalhães et al., 2012), in particular with patients and their demands (Song & Shi, 2017; Wan et al., 2019). A lower score on openness may therefore be interpreted as a higher level of rigidity (Digman, 1989; Goldberg, 1990), or as a higher propensity for adopting coping mechanisms characterized by a strict adherence to professional schemas. Stress may arise from the collision between coping through adherence to professional procedural schemas and patients' requests. In particular, incongruent requests, worse outcomes, or failures may tax the internal coping mechanism by reducing the perceived self-efficacy, the perceived purpose of one's professional identity, or the subjective occupational trajectory. The authors postulate that, according to this framework of work, burnout risk progressively diminishes as professional occupations increase in their specificity and, conversely, that burnout risk progressively increases as professional occupations acquire a less-defined specificity or a gatekeeping/filtering role. In fact, a lower probability of developing burnout has been found in highly specialized occupations, such as physicians in contrast to nurses (Alacacioglu et al., 2009), or in younger consultants in comparison to more experienced personnel (Alacacioglu et al., 2009; Sanfilippo et al., 2017; Tarchi et al., 2020). A loss of specificity may therefore translate into a lower probability of successfully developing or adopting professional schemas in a constant manner. A summary of the proposed framework is presented in Figure 2.

To summarize, in light of the prospective model offered in Figure 1, screening tools before enrollment may need to consider personality factors to minimize the risk of post-deployment adjustment disorders. With respect to the specific concerns in healthcare and military emergency settings, openness might not be a protective factor, as previously suggested. Emotional stability was observed in association with lower risks of anxiety and depression but also with a higher risk of depersonalization. As age is often correlated with occupational experience, targeted interventions might need to address the a-specificity of the current findings and, as a result, avoid offering training and support only for new or inexperienced recruits.

Limitations

While the present study was performed on an adequately powered sample, the specific role exercised during an emergency and the specific stressors to which the individuals were exposed are posited to be heterogeneous and significant in the relationship between individual factors and maladaptive responses (i.e., anxiety, depression, and burnout). Further studies on the contributions of specific roles exercised during deployment and particular stressors are warranted before generalization of the results. Finally, the cross-sectional design of the study does not permit a direct appraisal of the direction of causality between the collected variables, which was therefore derived from previous studies.

Conclusions

The present study elucidates the role of gender and personality factors in the development of anxious, depressive, or burnout symptoms in a population of reserve force volunteers after deployment. In contrast to the current literature, openness was found to be

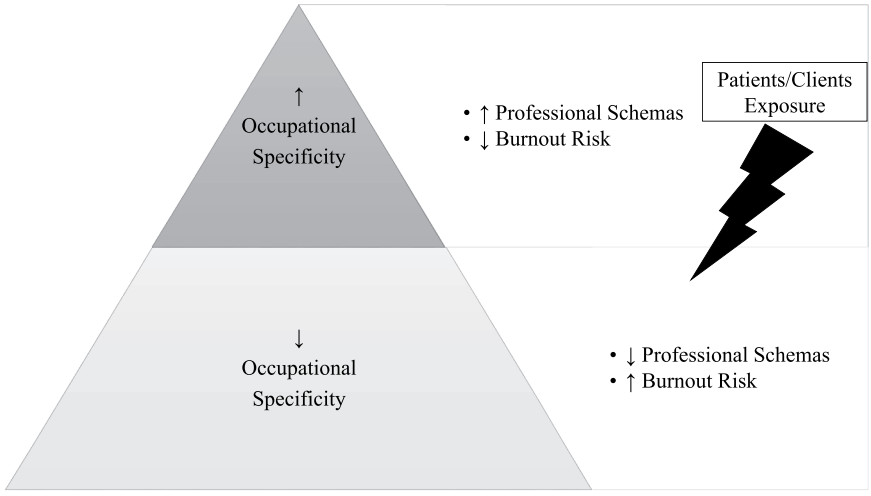

Figure 2. A lower openness to experience, as a proxy for rigidity, was associated with a higher risk of burnout in aid professionals exposed to chronic occupational stress during the COVID-19 pandemic. This effect might be mediated by adherence to professional schemas, whereby the occupational role of the employee favors diverging outcomes based on subjective occupational self-efficacy in a heterogeneous environment. Exposure to patients or clients seemed to play a fundamental role in the development of burnout.

a predisposing personality factor in the development of burnout dimensions. Furthermore, emotional stability was observed in association with lower risks of anxiety and depression, but also with a higher risk of depersonalization. In healthcare and military emergency settings, openness might not be a protective factor, as previously suggested. The authors discussed the relevance of this finding in regard to the theoretical framework of burnout and personality factors. More specifically, openness might be interpreted as a propensity to decrease one's distance to others as a consequence of a higher degree of empathy, in particular for patients' demands. Conversely, lower openness may signal a higher propensity for adopting coping mechanisms characterized by strict adherence to professional schemas, or to directives given by superiors in command. Stress may then arise from the collision between individual coping mechanisms and specific occupational factors. In summary, a higher risk can be posited for those professional figures who adhere to professional schemas in a less-stringent manner, as long as the specific occupational factors are present (healthcare related – eg, exposure to patients – or organizational – eg, facing heterogeneous demands to which is impossible to derive clear directives). According to this novel framework of conceptualization, burnout risk may progressively diminish as professional occupations increase in their specificity. In fact, a loss of specificity may translate into a lower probability of successfully developing and/or adopting professional schemas in a constant manner. The authors call for targeted interventions in volunteers employed in emergency settings, in order to promote self-awareness and functional coping mechanisms, and possibly to prevent depersonalization manifestations. As age is often correlated with occupational experience, targeted interventions might need to address the a-specificity of the current findings, and avoid offering training and support only for new or inexperienced recruits.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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Author contributions

L.T. conceived and designed the study, with the supervision of P.C. and K.T.; P.C. and L.T. collected the data, with the aid of K.T.; L.T. performed the statistical analysis. The first draft was

written by L.T. with the aid of P.C. and K.T.; All authors contributed to the interpretation of the studies and to the synthesis of results. The final manuscript was approved by all the authors.

Data availability

The datasets generated during the current study are available from the corresponding author on reasonable request.

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