



The Role of Life Meaning in Psychological Distress and Post-traumatic Growth Among Italian First-Aid Volunteers During the COVID-19 Outbreak

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Abstract

The coronavirus disease 2019 (COVID-19) pandemic has been a sudden and disruptive event that has produced lots of deaths, overload of the healthcare system, interruption of social habits, and change in life prospective. The study aimed to explore the relationships between meaning of life, psychological distress, and post-traumatic growth in volunteers from the first-aid associations operating in Italy belonging to the areas most affected by the pandemic (Bergamo, Brescia, and Parma). Our hypothesis anticipated that the meaning of life can mediate the relationship between psychological distress and post-traumatic growth. We, also, expected that this effect could vary with the role played in the rescue team, the increased shifts' amount, and the monetary incentive. Using a cross-sectional design, a convenience sample of 268 consenting participants completed Depression, Anxiety and Stress Scale (DASS-21), Post-Traumatic Growth Inventory (PTGI), and Personal Meaningful Profile-Brief (PMP-B). Findings yielded a positive relationship between psychological distress and post-traumatic growth ($r = .284$). Regarding the meaning of life, Spearman's correlation revealed that the two dimensions of "Self-Transcendence" and "Religion" are moderately involved in the post-traumatic change (specifically, "New Possibilities" $\rho = .237$, "Personal Strength" $\rho = .252$, and "Spiritual Change" $\rho = .373$). Logistic regression failed to show any effect concerning role, shifts' amount, and distress level. Finally, the monetary incentive appeared to not influence the altruism's propensity. Even though our findings should be interpreted with caution, this study provides evidence for the relevance of meaning of life to understanding of resilience and promoting the well-being of workforce following traumatic experiences.

Keywords COVID-19 · Psychological distress · Meaning of life · Post-traumatic growth · First-aid volunteer

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Introduction

The coronavirus disease 2019 (COVID-19) global pandemic has caused a colossal emergency with dramatic concerns on the health, economic, and psychological grounds. Italy was the first European country to face the virus, particularly in northern Italy as the region of Lombardia, which suffered the highest number of infections and deaths during the COVID outbreak between March and May 2020 (ISTISAN, 2020). To prevent and constrain the spread of infections, the government has set up a 2-month quarantine period establishing several social norms such as the use of facial masks, frequent hand washing, and interpersonal distancing; most of the work activities are remotely shifted, and social events were suspended as never before. Lockdown measures were determined by the government to contain the infection rate and applied first to the so-called Red zone (Lombardia and 14 provinces of Veneto, Emilia Romagna, Piemonte, and Marche) and then to the whole country (named DPCM, i.e., Decreto del Presidente del Consiglio dei Ministri, see DPCM on March 09, 2020). Exposure to a potential traumatic event can unleash a cascade of negative reactions including anxiety, depression, and post-traumatic stress disorder (PTSD). Fear of contagion and social confinement have brought symptoms such as anxiety, worries, post-trauma stress, depression, and sleep deprivation (Huang & Zhao, 2020; Serafini et al., 2020; Wang et al., 2020) impairing the psychosocial functioning and the adaptation to daily living (Nguyen et al., 2020; Wang et al., 2020). The impact of COVID-19 pandemic was explored through its relationships with sociodemographic characteristics, pre-existing psychological concerns, availability of medical resources, and prevention/control measures put into action against the epidemic (Qiu et al., 2020; Wang et al., 2020). It was also suggested that personality influences behaviors in the context of infectious disease or pandemic (Bacon & Corr, 2020) indicating that people experienced psychological conflict between the urge to stay safe and the desire to maintain a normal life. In the general population (Delmastro & Zamariola, 2020; Mazza et al., 2020; Wang et al., 2020), women exhibited increased anxiety, depression, and stress levels rather than men. Long duration of quarantine was associated with poor mental health specifically, post-traumatic stress symptoms, avoidance behaviors, and anger. Some studies have indicated long-lasting effects (Brooks et al., 2020). Healthcare workers, threatened by an unknown, very contagious, and lethal infection, and often in conditions of overwhelming workload, depletion of personal protection equipment (PPE), and lack of particular drugs forced to make decisions about the patients' life and death (Lai et al., 2020; Tan et al., 2020), revealed symptoms of depression, anxiety, insomnia, higher risk perception, level of worry, and distress, particularly among women, nurses, and frontline workers directly engaged in diagnosing, handling, or providing care to patients (Simione & Gnagnarella, 2020).

On the other hand, quarantine and self-isolation may have offered time to resuscitate values, needs, and aspirations, in that the traumatic events may have promoted a larger contact with their own spirituality, encouraging the expression of emotions, empathy, compassion, and altruism (Belfroid et al., 2018; Milstein,

2019; Phua et al., 2005). From this perspective, it can be believed that potentially traumatic events have the potential to catalyze a host of positive reactions, including improvements in personal, interpersonal, and spiritual functioning, yielding positive consequences in terms of resilience, post-traumatic growth, and meaning of life. Post-traumatic growth is the subjective experience of positive psychological change registered by a person because of struggling with a traumatic event (Tedeschi, 1999). A consequence, often deemed as an element of growth, is the establishment of a new “[meaning of life](#).” Personal meaning is designed to include five components: affective, motivational, cognitive, relational, and personal (Wong, 1989). The first Meaning Management Theory (Wong, 2007) argues that individuals can accomplish the various processes related to meaning to meet the survival need and happiness, through the defensive disposition or the proactive one. Those who prefer the positive stance, contrarily to those who choose the defensive one, would be willing to cope with the crisis creating opportunities for personal growth with the aim to achieve certain significant life goals, such as competencies, self-efficacy, creativity, or purpose. Meaning of life involves the understanding of existence and experience, and the degree of personal satisfaction with life and it is also expressed in having aims, purposes, or mission towards which the individual directs his/her efforts (García-Alandete et al., 2013; Prieto-Ursúa & Jódar, 2020).

Research aimed at a deeper comprehension of how individuals characterize and redefine their personal meaning of life across a traumatic event such as a pandemic is still lacking. Recently, the occurrence of post-traumatic growth during COVID-19 was associated with meaning, religiosity, and spirituality (Prieto-Ursúa & Jódar, 2020). It was shown that even in traumatic life events, it is possible to find sources of growth. Among the experiential factors, having been exposed to death predicts a better personal and social growth. As for the meaning, it emerged that having life purposes and striving to achieve our goals are associated with post-traumatic growth and a more valuable, intimate consideration for life.

The COVID-19 outbreak involved powerfully the first-aid volunteers rescuers who played critical roles in the response to the pandemic as they assisted patients suffering from the virus disease and all the emergency users, moved infected patients from a hospital to another because of the overcrowding, transferred oxygen cylinders to home-care patients, or carried drugs and groceries to elderly and lonely individuals in quarantine. Volunteers, even during previous pandemics, such as Ebola in 2013, exhibited bravery and altruism, and it was clear that altruism is one of their motivational traits (Belfroid et al., 2018). To our knowledge, no investigation to date has examined the impact of COVID-19 pandemic among first-aid volunteers in Italy. Currently, none of the existing studies addresses the relationship between helping and meaning of life in situations like the current pandemic during which helping puts the helper at great personal risk. Thus, investigation on resilience factors and resources that are associated with mental distress during the recent COVID-19 pandemic will offer relevant insights for dealing with future crises. Because life meaning is a core psychological construct to promote career calling, and positive affect also is a protective factor, some research considered it an important investigation area to explore the interaction

in determining positive psychological outcomes. Based on the broaden-and-build theory, positive emotions can broaden people's thought-action repertoires progressively building enduring personal resources with long-term adaptive benefits (Fredrickson, 2013). Career calling is regarded as an important index of personal flourishing and eudaimonic well-being (Brown & Lent, 2016; Leffel et al., 2018). Particularly in times of crisis, meaning in life has been regarded as a crucial factor of resilience and coping ability. Meaning can be tried as present, i.e., meaningfulness; as absent without ensuing search, that is existential indifference. Meaningfulness is the fundamental trust that life is worth living (Schnell, 2020). It is based on an evaluation of one's own life as coherent, significant, and belonging. Individuals with a high sense of meaningfulness are more optimistic and hopeful than individuals who feel little meaning in their lives (Ferguson et al., 2017). They showed high degrees of self-efficacy, self-compassion, and resilience. Meaningfulness is strongly related with lower mental distress. This suggests that the meaning of life may be a safe existential foundation that allows people to evaluate stressors more as a convenient challenge rather than as harm or loss, even when some pillars of identity break away in times of crisis.

Thus, this research aimed at exploring the mental health burden of the Italian first-aid volunteers (including the Italian Red Cross, Public Assistance, and other voluntary entities of rescue and assistance), operating in the areas of Northern Italy most affected during the first pandemic peak, responds therefore to the call for studies of outcomes of exposure to traumatic event also investigating how meaning of life and distress work together to correlate with post-traumatic growth. Recent studies concerning COVID-19 showed different mediating roles of stress, meaning-making, and personal resources with the cognitive and affective dimensions of subjective well-being in general population and healthcare workers (Krok et al., 2021; Man et al., 2020; Mo et al., 2021; Schnell & Krampe, 2020). As the risk of contracting COVID-19 among healthcare workers is relatively high and unpredictable, it can give rise to intense distress that affects cognitive and affective responses (Crawford & Henry, 2003; Lovibond & Lovibond, 1995). Given that health is an extremely risky and dangerous condition, it is plausible that level of stress would determine widespread consequences on well-being. Our hypothesis anticipated that the meaning of life can mediate the relationship between psychological distress and post-traumatic growth. By offering individuals important goals and values, enabling them to reinterpret their life experiences and directing their energies, meaning in life can noticeably influence the ways in which workers deal with stress and maintain their efficiency. Namely, compared to volunteers with a weak meaning of life, post-traumatic growth may be more closely related to lower distress for those with an intense meaning of life. Given that the COVID-19 pandemic is a prolonged stressful situation, particularly for those who operate in the context of healthcare, the availability of meaning in life would enable the workers to manage stress and encourage positive functioning and post-traumatic growth. Therefore, basing on the existing research presented earlier, we assume that disposition to altruism and job characteristics plays a role in adjustment outcomes. We hypothesized that greater disposition to altruism would be associated with lesser distress and higher post-traumatic growth. We also anticipated that job factors such as the role and the number of shifts would

potentially influence psychological distress, without any definite hypothesis on the direction of influence.

Methods

Recruitment

To include a broader range of experiences, the study used purposive heterogeneous sampling as well as convenience sampling strategies—for instance, referral from other participants. Volunteers were mainly reached through contact and collaboration with managers of the first-aid associations (such as Italian Red Cross, Public Assistance and Federation of Rescue Volunteers), who were invited to spread to their staff an online survey in the type of Quick Response code (QR code) or the relevant link for response. The study also used flyers and Web presentations at various collaborating organizations sites in Brescia, Bergamo, and Parma to recruit participants obtaining permission from the authorities, and then posted flyers. We thus used a kind of convenience sampling with the aim of addressing as many different individuals as possible. Participation was voluntary and without compensation, and could be terminated anytime. To be included, participants had to fulfill the following criteria: (i) age > 18 years at the time of inclusion; (ii) stable residence in Bergamo, Brescia, or Parma; (iii) belonging to first-aid associations. They were asked to scan the QR code and complete the online questionnaires after signing the informed consent to participate in the study.

The Survey

Due to the special nature of the period which prevented conducting investigations meeting participants face-to-face, a self-reporting methodology was employed. To assess associations between psychological distress, post-traumatic growth, and personal meaning of life during the COVID-19 first pandemic peak, a Web-based cross-sectional survey was scheduled using the software Google Moduli. Before being able to answer the questions, respondents were provided detailed information concerning the study aims, instructions, and informed consent. They were informed that their involvement into the study was completely voluntary, and they were free to withdraw at any time. Data were anonymous (anonymity was guaranteed by an identification code) and were treated according to Italian law concerning general data protection. All participants expressed their informed consent by explicitly agreeing to continue with the questionnaire after being informed about the study's aims, employed data protection, participants' rights, and contact for questions or details.

Ethics

The research protocol was approved by the local Ethics Committee, and it was conducted in accordance with the ethical standards of the Helsinki Declaration and

signed informed consent was obtained from all the participants. By agreeing to participate in the study, participants declared to have voluntarily chosen to take part in the research, to have understood the study aims described in the information form leading the questionnaire completion, and to have been informed about the guarantee of privacy and anonymity. Electronic informed consent was obtained from everyone prior to starting the survey.

Study Design

The present research adopted a correlational design to assess the first-aid volunteers' psychological response during the initial stage of the COVID-19 pandemic together with their relationship with the measured constructs (meaning of life, psychological distress, and post-traumatic growth) and their specific dimensions investigated.

Data Collection

Data collection was conducted between May 1 and July 30, 2020, to collect the immediate reactions to the emergency. Clicking the link or the QR code provided, first appears the informational sheet that explained that a study examining the psychological factors related to life experiences in volunteering during the COVID-19 pandemic was being conducted by university academics and participants are asked to give informed consent if they agree to participate in the study. Afterwards, the survey began with questions about demographic data, COVID-19-related information, and volunteering related information, followed by formalized measures.

Measures

Sociodemographic Questionnaire

A questionnaire COVID-19-related experience was developed to record respondents' sociodemographic, job-related characteristics, and COVID-19 experience. Authors compiled a first list of items that was revised by four experts (medical doctors and psychotherapists) to remove, modify, or add relevant items. It was composed of three sections. The first part contained sociodemographic information such as gender, age, nationality, civil status, education, occupation, and number of family members. In the second section, participants were required to refer their experience with COVID-19 (in particular, contact with suspected or confirmed cases, symptomatology, use of the regional toll-free number, access to the medical clinic or the emergency room or need for hospitalization, administration of diagnostic tests, confirmed positivity and home quarantine, positivity, home quarantine, and death of one or more family members or friends). The third section included questions about participant's practice of volunteering: association's location (Bergamo, Brescia, or Parma), functions accomplished during the pandemic and reasons, role played in the association (status, years of service, number of shifts during the epidemic).

Psychological Distress

The psychological distress was evaluated through the “Depression Anxiety Stress Scale—Short Version” (DASS-21) (Henry & Crawford, 2005). The DASS-21 is one of the most widely used psychometric tests for the assessment of distress along the three axes of depression, anxiety, and stress. It consisted of a list of twenty-one items, 7 items per subscale assessing how often the participant experienced symptoms of depression (e.g., “I felt I wasn’t worth much as a person”), anxiety (e.g., “I felt I was close to panic”), and stress (e.g., “I found it hard to wind down”) across the past week. Subjects are requested to score every item on a scale from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much”). Sum scores are computed by adding up the scores on the items per (sub)scale. Sum scores for the total DASS-total scale thus range between 0 and 63 and those for each of the subscales may range between 0 and 21. Cutoff scores of 4 for depression, 3 for anxiety, and 7 for stress differentiate a normal score from one worthy of attention. The study employed the adapted Italian version by Bottesi et al. (2015) that showed a very good reliability (Cronbach’s alpha coefficients exceeded 0.70 both in the community and clinical samples, either in the total score or in the subscales scores).

Post-traumatic Growth

Post-traumatic growth was explored with the “Post-Traumatic Growth Inventory” (PTGI) (Tedeschi & Calhoun, 1996). The PTGI is the most common self-reported approach to measuring post-traumatic growth and contained 21 items assessing the positive changes experienced in the aftermath of a traumatic or stressful event. The items are rated using a 6-point Likert scale with values ranging from 0 (“I did not experience this change as a result of my crisis”) to 5 (“I experienced this change to a very great degree as a result of my crisis”). The affirmations evaluate the five dimensions of post-traumatic change: relationships (e.g., “I have a greater sense of closeness with others”), new possibilities (e.g., “I established a new path for my life”), personal strength (e.g., “I know better that I can handle difficulties”), spiritual change (e.g., “I have a better understanding of spiritual matters”), and appreciation for life (e.g., “I have a greater appreciation for the value of my own life”). Sum scores are computed by adding up the scores on the items per (sub)scale. The total score of the PTGI ranged from 0 to 105. The inventory does not provide a cutoff score: the higher the result, the higher the level of post-traumatic growth. Our study applied the validated version for the Italian population (Prati & Pietrantonio, 2014) in which the scale showed a strong internal consistency and reliability in the Italian sample (Cronbach’s alpha = 0.93).

Meaning of Life

The meaning of life was assessed through the questionnaire “Personal Meaningful Profile-Brief” (PMP-B). The PMP-B (McDonald et al., 2012) is a 21-item instrument which has much utility for research involving personal meaning. It was developed from the longer 54-item PMP (Wong, 1998). The questionnaire is intended

to identify what really matters in people's life measuring the personal meaning that respondents feel in their lives. The seven subscales of PMP-B are as follows: Achievement, Relationship, Religion, Self-transcendence, Self-acceptance, Intimacy, and Fair treatment. The affirmations are rated using a 7-point Likert scale with values ranging from 1 (none) to 7 (most). The questionnaire does not provide a cutoff score: the higher the result, the more important is the meaning given to life. The internal consistency (Cronbach's alpha) for the 21-item PMP-B reported by the developers was 0.84. Because an Italian adaptation of this tool is still lacking, the scale was translated to Italian and validated by a focus group of homologous participants and feedback from key informants. Due to the lack of adaptation and validation of the instrument in the Italian population, to obtain a total score, we have applied the same methodology used for the PTGI, through which the total score indicator derived from the sum of the single subscales scores.

Data Analysis

To ensure the quality of the survey, we excluded 24 responses because of duplicate data and one individual who did not give the consent. Finally, a total of 268 participants who completed the questionnaire were included in the analysis. Job characteristics of interest (status in association, role played, and number of shifts) were classified as categorical variables. Before the main analyses, several preliminary analyses were performed to describe all the variables examined in [the survey](#). To statistically compare the scores from the three questionnaires, we adopted the 75th percentile as the cutoff useful to dichotomizing the variables. Single DASS-21 subscale scores were dichotomized into two levels, "Normality range" and "Potentially pathologic" according to the cutoff established at the 75th percentile. As for Depression subscale, scores ≤ 4 are considered being in the normality range and ≥ 5 as potentially pathological; for Anxiety subscale, scores ≤ 3 are evaluated as typical and ≥ 4 as potentially pathological; for Stress subscale, scores ≤ 7 are considered typical and ≥ 8 as potentially pathological. PTGI subscales scores were dichotomized into "Normal" and "Above normality" (higher indicates a deep post-traumatic change) according to the 75th percentile cutoff, so for the "Relationship" subscale scores ≥ 15 are considered above normality; for "New possibilities" and "Personal Strength" subscales scores ≥ 10 are higher; for "Spiritual Change" subscale scores ≥ 2 are above normality; and for "Appreciation of Life" ≥ 8 are higher. Finally, following the same principle, also the PMP subscales scores were dichotomized into "Normal range" and "Above normal range." Thus, for the "Achievement" subscale, scores ≥ 18 are above normal range; for "Religion" subscale, scores ≥ 13 are above; for "Relationship" subscale, scores ≥ 19 are evaluated as above normal range; for "Self-Transcendence" and "Self-Acceptance" subscales, scores ≥ 17 are above; for "Intimacy" subscale, scores ≥ 20 are above; and, finally, "Fair Treatment" subscale, scores ≥ 16 are considered above normality.

Pearson's r correlation analysis was carried out to examine whether psychological distress was associated with post-traumatic growth, and Spearman's analyses to determine whether Distress (measured by the DASS-21) and Post-Traumatic Growth

(assessed by the PTGI) singularly were associated to Meaning of life (evaluated by the PMP-B).

Among all the variables investigated through the sociodemographic questionnaire, we are interested in the impact of the role played in the association (rescuer, team leader, driver, and administrative) and the number of shifts. We firstly performed a descriptive analysis to point out the mean scores (95% CI) of each dimension stratified by role. Then, we explored the association between “Role” and both DASS-21 total and dimensions’ scores (dichotomized as already indicated) through a chi-squared test which produced any significant result. Consequently, we had not proceeded to the creation of a univariate ANOVA model to further explore potential causality relationships between the variables. The same procedure applied for evaluating the association with the “Shifts’ amount” did not produce any significant result.

To statistically analyze the anticipation about the effect of the monetary incentive, we compared volunteers and employees on the “Altruism” dimension from the PTGI through the independent-sample *t*-test. Statistical significance was defined as $p < 0.05$. All data were analyzed using Statistical Package for Social Sciences (SPSS) version 26.0 (IBM Corp.) and software RStudio, version 4.0.2. (R Development Core Team, 2014).

Results

Characteristics of Respondents, Socio-anamnestic Information, and COVID-19 Experience

The respondents’ final sample included 268 participants. Descriptive statistics and correlations for all study variables are presented in Tables 1, 2, and 3. One hundred and fifty of respondents (56%) self-identified as females. The participants’ mean age was 37.16 years ($SD = \pm 14.10$) within the range from 18 to 77 years. More than half of the sample ($n = 148$, 55.2%) were undergraduate with a high school degree, and currently employed ($n = 182$, 67.9%). Marital status was mainly represented by singles ($n = 93$, 34.7%). Concerning their COVID-19 experience, 224 (83.6%) of the respondents had contact with a suspected case of infection and 191 (71.3%) with a confirmed one. In the whole sample, 66 individuals (24.6%) had symptoms compatible with COVID-19 disease (e.g., fever, cough, breathing difficulty, sore throat, and asthenia), 47 (17.5%) were tested for the virus, and 31 (11.6%) were quarantined. Only 8 (3%) respondents have reported to have been affected by the virus and, of these, only half have been quarantined, probably because they did not suspect being infected, discovering it only later. As of the infection, 15 respondents (5.6%) declared to have had at least one family member that had been infected and 13 (4.9%) at least one who died; concerning friend, 250 respondents (93.3%) declared to have had at least one friend that had been infected and 209 of the sample (78%) reported at least the death of a friend. We have investigated respondents’ experience with COVID-19 but, considering the small size of our sample, none of these variables was exploited to test hypotheses nor to make statistical inferences.

Table 1 Sociodemographic characteristics of the overall study sample

	<i>N</i> = 268	<i>n</i>	(%)
Gender	Female	150	(56%)
	Male	117	(43.7%)
	Genderfluid	1	(.4%)
Nationality	Italian	262	(97.8%)
	Albanian	2	(.7%)
	Moldovan	2	(.7%)
	Pakistani	1	(.4%)
	Romanian	1	(.4%)
Schooling	Secondary school	23	(8.6%)
	High school	148	(55.2%)
	Graduation (Bachelor/Master)	76	(28.4%)
	Post-graduate	16	(6.0%)
	Other	5	(1.9%)
Occupation	Student	55	(20.5%)
	Employed	182	(67.9%)
	Unemployed	19	(7.1%)
	Retired	12	(4.5%)
Marital status	Single	93	(34.7%)
	Engaged	53	(19.8%)
	Cohabitant	28	(10.4%)
	Married	70	(26.1%)
	Separated/divorced	23	(8.6%)
	Widow	1	(.4%)

Considering the experience of volunteering, 165 respondents (61.6%) worked in Brescia, 74 (27.6%) in Parma, and 29 (10.8%) in Bergamo. Roughly the entire sample is represented by volunteers ($n = 241$, 89.9%) and only a small part from employees ($n = 27$, 10.1%). As for the role, half of the respondents are rescuers ($n = 134$, 50%), followed by team leaders ($n = 80$, 29.9%), drivers ($n = 41$, 15.3%), and administrative ($n = 13$, 4.9%). During the first pandemic peak (March–May 2020), most of the respondents ($n = 61$, 26.4%) carried out more than 20 shifts. In the whole sample, 236 respondents (88.1%) had worked during the outbreak and, of these, 116 (49.15%) were involved in different tasks than usual (e.g., bringing drugs and duties to quarantined people, aiding in hospitals, or bringing oxygen cylinders to home-care patients). On the other side, 32 respondents (11.9%) had not worked during the outbreak either for personal choice ($n = 22$, 68.75%) or as a precautionary rule by the association ($n = 9$, 28.12%).

Psychological Distress, Post-traumatic Growth, and Meaning of Life

The DASS-21, PTGI, and PMP-B mean scores (M) and standard deviations (SD) are reported in Table 2 where the subscales composing each tool and the range of

Table 2 Descriptive statistics of the means and standard deviations for DASS-21, PTGI, and PMP (total measures and single dimensions investigated) for the overall sample ($N=268$). There are also indicated the range of each scale and the range for confidence interval (CI)

	Scale range	<i>M</i>	SD	Mean CI 95%
DASS-21 total	0–63	10.78	9.17	9.68 – 11.89
Depression (DASS-21 D)	0–21	3.13	3.58	2.69– 3.55
Anxiety (DASS-21 A)	0–21	2.21	2.58	1.89– 2.51
Stress (DASS-21 S)	0–21	5.45	4.21	4.94– 5.95
PTGI total	0–105	27.87	21.40	25.29–30.44
Relationships (PTGI-R)	0–35	9.02	7.85	8.07– 9.96
New Possibilities (PTGI-NP)	0–25	6.33	5.55	5.66– 7.00
Personal Strength (PTGI-PS)	0–20	6.11	4.96	5.51– 6.70
Spiritual Change (PTGI-SC)	0–10	1.20	1.96	0.96– 1.43
Appreciation of Life (PTGI-AL)	0–15	5.21	3.67	4.76– 5.65
PMP total	0–147	94.25	20.73	91.76–96.74
Achievement (PMP-A)	0–21	14.97	3.88	14.50–15.44
Relationships (PMP-RSHIP)	0–21	16.10	3.59	15.66–16.53
Religion (PMP-R)	0–21	8.19	5.58	7.52– 8.86
Self-Transcendence (PMP-ST)	0–21	13.54	3.95	13.06–14.02
Self-Acceptance (PMP-SA)	0–21	13.80	3.66	13.36–14.24
Intimacy (PMP-I)	0–21	14.55	5.70	13.86–15.23
Fair Treatment (PMP-FT)	0–21	13.08	3.77	12.62–13.53

score for each scale are also indicated. The composite DASS-21 score ($M=10.78$, $SD=\pm 9.17$) was at the normal level with similar patterns for the subscales scores as in the non-clinical sample from the Italian adaptation (Bottesi et al., 2015). Concerning the PTGI that evaluates the positive changes experienced in the aftermath of a traumatic event, the participants overall showed a mean PTGI total score of 27.87 ($SD=\pm 21.40$). The results revealed that levels for all subscales were within the mean range. As far as the Personal Meaningful Profile-Brief, the average total ($M=94.25$; $SD=\pm 20.73$) and subscales scores were around 15 or above, comparable to the original authors' findings (McDonald et al., 2012).

Relationships Between Psychological Distress, Post-traumatic Growth, and Meaning of Life

A full zero-order correlation matrix was created for a preliminary analysis of the main variables this study is concerned with (see Table 3). The first hypothesis in this investigation concerned the role of Meaning in Life in the relationship between Distress and Post-Traumatic Growth. The assumption predicted that Meaning of Life would have a stronger positive relation with Post-Traumatic Growth and negative with Distress. Among all the relationships investigated, we decided to consider noteworthy only those whose correlation index “ r ,” intended as a measure of effect size, is $>|0.2|$, even if the p -value is statistically

Table 3 (continued)

	DASS-21		PMP									
	PTGI		PMP A	PMP RSHIP	PMP R	PMP ST	PMP SA	PMP I	PMP FT			
DASS-21	.284**		-.142*									
TOT												
	PTGI R	PTGINP	PTGIPS	PTGI SC	PTGI AL	PMP A	PMP RSHIP	PMP R	PMP ST	PMP SA	PMP I	PMP FT
Appreciation of Life (PTGI-AL)	.206**	.235**	.196**		.080	.050	.143*	.152*	.053	-.065	.137*	
PMP-B	-.142*											
Achievement (PMP-A)	.141*	.102	.146*	.069	.080							
Relationships (PMP-R)	-.129*	-.071	-.067	.113	.081	.105	-.107	.050				
Religion (PMP-R)	.055	-.038	-.047	.096	.097	.108	.373**	.143*				
Self-Transcendence (PMP-ST)	-.077	.048	-.004	.153*	.237**	.252**	-.169**	.152*				

significant; those, whose effect size is $< |0.2|$, will be considered negligible. As shown in Table 3, Pearson correlation analysis showed that DASS-21 total score was positively correlated with PTGI total score ($r=0.284, p<0.01$). Higher scores of DASS-21 depression subscale relate to higher ones in the PTGI dimensions of “Relationships” ($r=0.283, p<0.001$), “New Possibilities” ($r=0.212, p<0.001$), and “Appreciation of Life” ($r=0.206, p<0.001$). Higher scores of DASS-21 anxiety subscale relate to higher ones in the PTGI dimensions of “Relationships” ($r=0.349, p<0.001$), “New Possibilities” ($r=0.278, p<0.001$), “Personal Strength” ($r=-0.232, p<0.001$), and “Appreciation of Life” ($r=0.235, p<0.001$). Finally, higher scores of DASS-21 stress subscale relate to higher ones in the PTGI dimensions of “Relationships” ($r=0.289, p<0.001$) and “New Possibilities” ($r=0.218, p<0.001$). The DASS-21 total score was negatively related to PMP-B total score ($r=-0.142, p=0.019$), but the extent of this correlation is statistically negligible; all the correlations between DASS-21 subscales and PMP-B ones are statistically negligible. The PMP-B total score is related to the PTGI one ($r=0.141, p=0.020$) but the extent of this correlation is statistically negligible. However, the PMP-B subscale of “Self-Transcendence” (PMP-ST) is significantly related to the Post-Traumatic subscales of “New Possibilities” (PTGI-NP) ($r=0.237, p<0.001$) and “Personal Strength” (PTGI-PS) ($r=0.252, p<0.001$), and the PMP “Religion” subscale (PMP-R) is linked to the “Spiritual Change” from Post-Traumatic Growth Inventory (PTGI-SC) ($r=0.373, p<0.001$).

A logistic multiple regression with continuous predictors (Achievement, Relationships, Religion, Fair treatment, Intimacy, Self-acceptance, and Self-transcendence) was employed to determine whether Meaning of Life dimensions are a better predictor of how participants may experience Post-traumatic Growth. Logistic multiple regression results are reported in Table 4. All prerequisites of the model are respected. The model combining these facets showed that collectively all subscales of the PMP-B explain 9% of the total PTGI score ($R^2=0.092, R^2$ adjusted=0.067). Specifically, the subscales that are significantly related to this score are “Intimacy” ($p<0.027$) and “Self-Transcendence” ($p<0.024$).

Table 4 Significant predictors of Personal Meaningful Profile (PMP-B) scale for the Post-Traumatic Growth Inventory (PTGI) total score

Coefficients	Estimate	Stand. Coeff	<i>t</i> -test	<i>p</i>
Achievement (PMP-A)	0.25	0.04	0.53	0.60
Relationships (PMP-RSHIP)	-0.26	-0.04	-0.50	0.62
Religion (PMP-R)	0.34	0.08	1.35	0.18
Fair treatment (PMP-FT)	0.87	0.15	1.88	0.06
Intimacy (PMP-I)	-0.54	-0.14	-2.23	0.02*
Self-acceptance (PMP-SA)	-0.33	-0.05	-0.76	0.45
Self-transcendence (PMP-ST)	1.04	0.19	2.27	0.02*

* $p<.05$

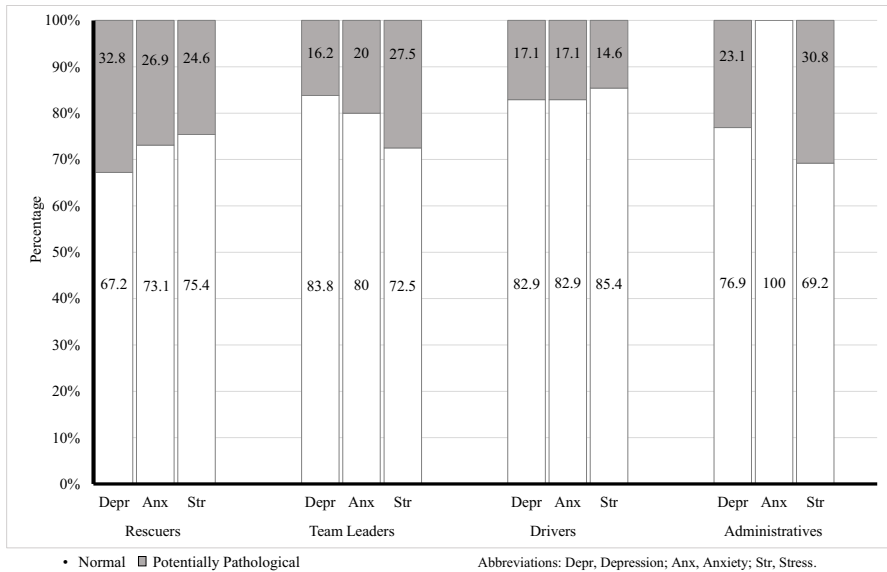


Fig. 1 Prevalence of Depression, Anxiety, and Stress from DASS-21 stratified by role

Table 5 Mean scores reported at DASS-2 subscales (\pm SD) and predictors of distress in relation with the role played in the association and measures of association (Chi-squared test)

DASS-21	Mean (\pm SD)				Chi-squared	
	Team leaders (<i>n</i> = 80)	Rescuers (<i>n</i> = 134)	Drivers (<i>n</i> = 41)	Administrative (<i>n</i> = 13)	χ^2	<i>p</i> -value
Depression	2.44 (\pm 3.18)	3.69 (\pm 3.86)	2.73 (\pm 3.36)	2.77 (\pm 2.83)	9.05	.029 (a)
Anxiety	1.90 (\pm 2.24)	2.59 (\pm 2.69)	1.85 (\pm 2.95)	1.31 (\pm 1.31)	6.28	.099
Stress	5.50 (\pm 4.14)	5.78 (\pm 4.27)	4.32 (\pm 4.26)	5.38 (\pm 3.45)	2.83	.418
Total	9.83 (\pm 8.52)	12.05 (\pm 9.58)	8.90 (\pm 9.44)	9.46 (\pm 6.22)	2.19	.053

(a) Because of cell quantiles that did not exceed 11.961, this value can be considered not significant

Association Between Psychological Distress and Exposure to the Outbreak

DASS-21 subscale scores were dichotomized into two levels, “Normal range” and “Potentially pathologic” according to the cutoff established at the 75th percentile. Results of estimated prevalence of Depression, Anxiety, and Stress collapsed by Job role during COVID-outbreak are displayed in Fig. 1. Table 5 displays mean scores (\pm SD) of Distress, together with that of Depression, Anxiety, and Stress stratified by role (Team leader, Rescuer, Driver, and Administrative), and chi-squared statistics from the entire sample.

Rescuers reported higher mean scores in all the three psychological distress dimensions compared to the other roles. The association between each subscale and the role played into the association during pandemics was tested by the chi-squared

test (χ^2). We have initially assumed that a more exposed role, such as that of a rescuer or team leader, would have been associated with higher levels of psychological distress. Conversely, findings revealed that the role is not significantly related with higher levels of depression, anxiety, stress, or general distress, as exemplified by the DASS-21 total score ($R^2=0.020$, R^2 adjusted=0.009). The absence of any association among variables has made it unnecessary to proceed with a regression model.

As for Psychological distress and Number of shifts, 37 responses were excluded from the analysis because they belonged to individuals not in duty during the first pandemic peak. Therefore, only 231 responses were analyzed. As shown in Table 6, where average and predictors of distress in relation to the number of shifts played in the association are reported, from the analysis no clear relationship emerged between the number of shifts and scores reported at the DASS-21 subscales. Contrary to the expectations, the highest average scores emerged in the lower range of shifts ($M=3.44$, $M=2.64$, and $M=5.84$ for Depression, Anxiety, and Stress subscales, respectively) compared to 5–10, 10–15, 15–20, and >20 shifts. Then, we examined if any difference existed between groups in the psychological state and if this difference was modulated by the variable “Number of shifts played,” assuming that a greater number of shifts are associated with higher levels of distress. To this aim, we conducted comparisons by means of the chi-squared test (χ^2), which are also reported in Table 6. As can be seen, we found no significant association between the number of shifts and levels of Depression, Anxiety, and Stress nor with the general distress exemplified by the DASS-21 total score ($R^2=0.009$, R^2 adjusted=-0.007). As for the role, also in this case, we have not continued with regression analysis.

Relationships Between Altruism and Remuneration

To investigate the anticipated difference between volunteers and employees on the propensity to altruism, we compared these participants on PMP-B scores from the subscales “Relationships” (PMP-RSHIP) and “Self-Transcendence” (PMP-ST) as measures of altruism. The comparisons revealed no difference between volunteers and employees in the mean scores of both dimensions. Student’s independent-sample *t*-test confirmed that volunteers and employees do not differ in their inclination to “Relationships” (16.17 vs. 15.44, $t = -0.84$, $p = 0.405$, d estimate = -0.203) and

Table 6 Prevalence (mean and \pm SD) and predictors of distress in relation to the number of shifts played in the association during COVID-19 outbreak and Chi-squared test results

DASS-21	Mean (\pm SD)					Chi-squared	
	0–5 shifts ($n=45$)	5–10 shifts ($n=39$)	10–15 shifts ($n=40$)	15–20 shifts ($n=46$)	> 20 shifts ($n=61$)	χ^2	<i>p</i> -value
Depression	3.44 (\pm 3.52)	2.49 (\pm 2.76)	3.08 (\pm 3.81)	3.09 (\pm 3.98)	2.93 (\pm 3.81)	4.21	.37
Anxiety	2.64 (\pm 2.74)	1.97 (\pm 2.48)	1.88 (\pm 2.42)	1.83 (\pm 2.47)	2.31 (\pm 2.72)	2.79	.59
Stress	5.84 (\pm 4.13)	5.00 (\pm 4.49)	5.50 (\pm 3.69)	4.48 (\pm 3.98)	5.39 (\pm 4.28)	4.60	.33
Total	10.75 (\pm 9.19)	10.69 (\pm 9.07)	10.67 (\pm 9.12)	10.78 (\pm 9.17)	10.69 (\pm 9.11)	1.20	.87

“Self-Transcendence” (13.65 vs. 12.63, $t = -1.196$, $p = 0.241$, d estimate = -0.257) as measures of altruism.

Discussion

In this paper, we investigated the distress in volunteers from the first-aid associations towards the health and social situation aiming at exploring the relationships with meaning of life and post-traumatic growth related to the outbreak of COVID-19 in north Italy. To this purpose, we conducted a study by means of online questionnaires administered to a convenience sample of volunteer participants. We invited participants to report their volunteering status during COVID-19 in different questions combined with psychological variables measuring distress, meaning for life, and post-traumatic growth. We obtained and analyzed data from 268 Italian adult and compared the answers given to the questionnaires.

Currently, it is recognized that it is possible to discover sources of post-traumatic growth even in traumatic situations, such as that caused by the COVID-19 pandemic (Cui et al., 2021; Lòpez et al., 2020; Prieto-Ursúa & Jódar, 2020). Consistent with these studies, participants of our research reported high levels of post-traumatic growth. Nevertheless, our findings indicated a positive relationship between psychological distress and post-traumatic growth, albeit of moderate magnitude at best, i.e., higher scores on the DASS-21 total scale are related to higher scores on the PTGI total scale. It appears that a greater depression is associated with a rise in “Relationship with Others” (PTGI-R), “New Possibilities” (PTGI-NP), and “Appreciation for Life” (PTGI-AV) scores inherent to the post-traumatic growth; furthermore, a large anxiety score is interrelated to raising in “Personal Strength” scores (PTGI-FP). Concerning the subscale concerning stress, findings revealed an increase only in scores regarding “Relationship with Others” (PTGI-R) and “New Possibilities” (PTGI-NP) belonging to the tool measuring the post-trauma growth. In a similar vein, also in the American population, it was found that elevated levels of post-traumatic growth relate to greater levels of anxiety and post-traumatic stress (Park et al., 2022). These results could reveal the presence of a sort of “the more panic, the more coping” phenomenon, in a similar vein with what emerged from a study among the Chinese population (Huang et al., 2020). Volunteers can respond effectively not only when they have been exposed to a negative event but also the greater the aversive potential of the traumatic event, the greater the resulting change. The finding that volunteers, working in emergency settings, achieved positive changes in their approach to life is reported in another study (Belfroid et al., 2018) carried out with a sample of volunteers working in deployable laboratories in West Africa during the Ebola outbreak in which positive experiences that reached far beyond their daily activity, such as a modification in their priorities in life and a greater appreciation of the value of their own lives, are reported.

We have hypothesized that meaning of life would have a stronger positive relation with post-traumatic growth and negative with distress. As anticipated by our original hypothesis, as for the meaning of life and psychological distress, also the PMP-B total score was negatively related to DASS-21 total score, but the extent of

this correlation is statistically negligible, as well as all the correlations between the PMP-B and DASS-21 subscales, probably due to the low homogeneity of the sample. As already emphasized (Oriol et al., 2020), meaning in life, together with gratitude, enhances the global perception of well-being. Similarly, Schnell and Krampe (2020) found that general mental distress decreased when meaningfulness was amplified, and Trzebiński and colleagues (2020) demonstrated that meaning of life is negatively related to anxiety and acts, together with life satisfaction and the basic hope, as a buffer against the panic reactions on the virus pandemic. As for the meaning of life and post-traumatic growth, the PMP-B total score is positively linked with the PTGI total score, but the extent of this correlation is statistically trivial. However, it was found that “Self-Transcendence” (PMP-ST), defined as a spiritual lifestyle that directs humans to surpass their own interests to care for others (Wong, 2016), is significantly related to the development of “New Possibilities” (PTGI-NP). Self-transcendence concurs to preserve interpersonal relationships and encourages individuals to build personal, physical, and mental resources in the long term (Oriol et al., 2020).

Furthermore, “Religion” (PMP-R) is significantly connected to the “Change in Spirituality” (PTGI-SC) and can be deemed as a lifestyle that encompasses all deeper dimensions of human experience, not just material ones. Therefore, in conditions that may threaten an individual’s psychophysical integrity, it seems that one recovers one’s faith and spirituality. These findings are congruent with the conclusions of Prieto-Ursúa and Jódar (2020), who proved that the perceived spirituality, as a measure of the meaning of life, significantly predicts (social and interpersonal) the post-traumatic growth.

Finally, we have assumed that a more exposed role, such as that of a rescuer or team leader, involved higher levels of psychological distress. Considering the exceptional nature of the current situation, volunteers, notably those whose role is more unprotected (e.g., rescuers and team leaders), should not be immune from exhibiting high levels of psychological distress due to both the sudden change in contextual factors—such as increased shifts, change in practices, and team structure—and the direct contact with an expanded sense of powerlessness, unpredictability, and uncertainty of human life. Our data have not confirmed our prediction about the influence of the role played within the association. Similarly, the number of shifts is not an influence variable. However, an interesting finding concerned the higher levels of distress for participants who performed fewer shifts during the first pandemic peak. This result could suggest an impact from the practice and a potential disposition to dehumanization, as a protective strategy, in individuals who played more shifts.

As regards the last hypothesis concerning the different propensity to altruism between volunteers and employees, no statistically significant variations arose from groups. It could be concluded that employees are motivated, in the same manner as volunteers by incentives going beyond mere remuneration, which are to be found in dispositions such as pro-sociality or behaviors such as empathy and altruism.

The results attained in the present study should be considered in the light of some limitations that may have influenced the outcomes. The first shortcoming concerned the sample size: despite the large number of associations contacted, the responses to the survey were not in large numbers. Secondly and due to the sudden occurrence of

the disaster, we were unable to assess the individual psychological conditions before the outbreak. Given our correlational design it cannot be taken to indicate any causal relationship between the variables. Finally, a key limitation of this investigation was the nature of the data that was based on self-reporting; this potentially can introduce some recall bias into the findings. Moreover, since a convenience sampling method was used to recruit participants, there is also a chance of selection bias.

Conclusions

Despite the limitations reported above, our study points out the mechanism involved in volunteers' activity and propension highlighting how that the post-traumatic growth can be more fully understood if related to the meaning of life. Interestingly, self-reported distress was associated with an increased post-traumatic growth, and propension to altruism seems to disregard the economic reward. Our experience indicates that the meaning of life enables them to become aware of their own role in remaining efficient and focused during stressful events like COVID-19 pandemic. Staff well-being is a critical component for enabling resilience at the institutional and individual levels that can be adequately addressed, offering appropriate training and mental health support resources.

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Author Contribution OP conceptualized the project and supervised investigation, and statistical analysis, and revising and editing the original draft of the manuscript. F and M collected and interpreted the data and drafted the manuscript. All the authors have read and approved the final version of the paper.

Data Availability The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Declarations

Ethics Approval The present study was approved by the Ethics Committee of Area Vasta Emilia Nord – AVEN (1301/2020/OSS/UNIPR 15/04/2021). Written informed consent for participation was required for this study in accordance with the national legislation and the institutional requirements.

Competing Interests The authors declare no competing interests.

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