

## Article

# Hardiness and Coping Strategies as Mediators of Stress and Secondary Trauma in Emergency Workers during the COVID-19 Pandemic

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**Abstract:** The work environment of emergency workers is an important factor related to stress. Coping with the COVID-19 emergency is a factor that is highly related to stress, and severe stress is a risk factor for developing secondary trauma. Coping and resilience can help rescue workers to better respond in emergency situations and could protect them from secondary trauma. We aimed to explore the relationship of emergency stress, hardiness, coping strategies, and secondary trauma among emergency workers and the mediating roles of coping strategies and hardiness on the effect of stress in producing secondary trauma. The study involved 513 emergency workers from the Red Cross Committee in Veneto, one of the Italian regions most affected by the COVID-19. Participants completed questionnaires online to measure emergency stress (physical, emotional, cognitive, organizational-relational, COVID-19, and inefficacy decisional), hardiness, coping strategies, and secondary trauma. Other variables analyzed were age, gender, weekly hours of service, and use of personal protective equipment (PPE). We performed *t*-tests, a correlational analysis, regressions, and a mediation analysis. Hardiness and coping strategies, in particular, which stop unpleasant emotions and thoughts and problem-focused, emerged as mediators in reducing the predicted effect of stress on secondary trauma. The mediating effects of hardiness and coping strategies were found to reduce the effect of stress on arousal by 15% and the effect on avoidance by 25%.

**Keywords:** COVID-19; stress; secondary trauma; coping; resilience; hardiness; emergency workers

## 1. Introduction

### 1.1. Stress and Secondary Trauma in Emergency Workers during the COVID-19 Pandemic

Since February 2020, Italy has been affected by the COVID-19 pandemic. The infection developed rapidly, leading to high numbers of infected and dead people. From the beginning of March, the country underwent a lockdown (phase 1) until May 4, when there was a reduction in infections (phase 2). Emergency workers, professionals, and volunteers were involved in several emergency activities for patients who needed help with transportation to the hospital, finding medicines, and basic needs.

Among the forms of assistance activated in the public and private spheres, the roles of the various voluntary public assistance associations (A.N.P.A.S.—National Association of Public Assistances) that provide emergency medical and social assistance and scheduled emergency and ambulance services is fundamental. The largest and most complex organization, also internationally recognized, is the Red Cross which, in addition to first aid and emergency intervention, has the aim of supporting the community in situations of emergency, disaster, and social inclusion. The Red Cross is divided into regional Committees, and this research work was done in collaboration with the Committee of

the Veneto Region, one of the Italian regions affected at the beginning of the COVID-19 emergency. Veneto has the fourth highest levels of infection and deaths of all regions in Italy [1].

The working environment of emergency workers is an important stress factor, because these individuals must work in emergency and healthcare situations [2]. During interventions, they are exposed to prolonged emotional suffering, potentially traumatic events or missions, and work-related chronic stress [3].

The literature has in fact highlighted how emergency workers who intervene in emergency situations are exposed to the risk of developing anxiety reactions and psychological diseases, which can turn into real mental disorders. Possible dysfunctional reactions can be identified at different levels: physical and/or physiological (e.g., psychosomatic disorders, alterations of the sleep/wake cycle and sense of tiredness); emotional (e.g., irritability, nervousness, agitation, anger, low self-esteem and guilt); cognitive (e.g., distractibility, sense of ineffectiveness and negative anticipation of events); and relational (for example, increased conflicts within emergency teams and/or with their organization/institution and social withdrawal). Secondary trauma reactions may also occur [4–8].

Figley [9] was the first to describe the phenomenon of secondary traumatization, which he called “the stress of helping others who are suffering or who have been traumatized” [9] (p. 10). He theorized that people who are in contact with trauma survivors can develop a traumatic response even without having experienced a traumatic event firsthand. Symptoms can be caused by repeated or extreme contact with the details of a traumatic event even without direct sensory impressions that are often delayed over time. Secondary Traumatic Stress Disorder (STS) exhibits symptoms identical to post-traumatic stress disorder (PTSD) such as intrusive symptoms, avoidance, and hyperarousal, also including depressive and anxiety symptoms. These symptoms are considered natural and consequent to the work within the intervention context of the first responders [10].

As indicated by the literature, not all emergency workers develop symptoms of secondary traumatization, but only a minority of first responders develop these symptoms [11]. According to Reinhard and Maercker [12], there is no connection between STS and specific traumatic events. However, there is a significant relationship between the number of traumatic events and STS symptoms, especially when connected to feelings of helplessness and horror.

Several studies have highlighted the predictive effect of some demographic variables on STS, such as gender [6,13–15]. Female first responders have been shown to have more STS symptoms than males, which suggest that females may be more vulnerable to secondary traumatization. This finding has been reported consistently in several studies [11,16]. Variables such as older age [14], work seniority [17], ethnicity [14], marital status [6], and professional rank [18] were also considered. Turgoose et al. [19] found that the longer people worked in this area, the greater the level of symptoms reported. However, this connection was not found when the years of overall working experience were considered.

There are also divergent results regarding positive correlations [20] and no correlations [21,22] between secondary trauma and the length of service. The studies have also reported contradictory results: one study found a negative correlation between age and STS [14], while two other studies found no effect [19,21].

According to Walton et al. [23] specific stressors that workers are facing during the COVID-19 emergency are related to the organizational context. Several studies highlight that the need to have adequate and necessary instructions as well as personal protective equipment (PPE) is strictly linked to stress in healthcare and emergency workers in large-scale emergencies [23–28]. In addition, limited resources, longer shifts, decreased hours of rest, and the occupational risks associated with COVID-19 exposure have contributed to increases in physical and psychological fatigue, stress, anxiety, and burnout in these workers [29].

Few studies have considered the differences in STS reactions between volunteers and professional emergency workers [11], highlighting that the volunteers who follow exhaustive and adequate training and preparation courses do not present significant differences compared to professionals.

### 1.2. Resilience, Hardiness, and Stress

Resilience is an important resource that helps people recover from difficult situations and deal with stress. We can define it as the ability to positively adapt during or after an adverse and dangerous situation [30]. Individuals with higher levels of resilience experience low levels of emotional and behavioral problems including depression, anxiety, and stress [31,32]. Arnetz et al. [33] suggested that resilience is associated with a low level of psychological distress and is a resource that should be considered during the assessment of risk and protective factors. Emergency workers are exposed to various human pains that can adversely affect their psychological state. To cope with these internal and external needs, workers must therefore mobilize and use psychological resources.

Several studies have indicated resilience factors that prevent first responders from developing symptoms of secondary traumatization [34–37]. One of the most researched protective factors is social support. A meta-analysis [38] showed the significant positive influence of social support on first responders' mental health. Subjectively perceived social support was found to have a stronger influence than material support. In addition, internal control [39], self-efficacy [40], collective efficacy at an organizational level (a group's ability to commit itself and achieve goals) [41], mindfulness, and engagement [42] are important resilience factors.

Another resilience factor that can preserve one against the negative consequences of adverse life events is hardiness. This construct was originally developed by Kobasa [43], who defined hardiness as a personality trait, characterized by the following personality disposition: "persons high in hardiness involve themselves in whatever they are doing (commitment), believe and act as if they can influence the events forming their lives (control), and consider change to be not only normal but also a stimulus to development (challenge)" [44] (p. 42). Bartone [45] underlined several studies that showed the role of hardiness as a safeguard against the negative effects of stress on health and performance. Some studies have shown that health workers with higher hardiness levels enjoy better levels of psychological well-being [46,47] and that hardiness is inversely correlated with stress in nurses working in emergency departments or crisis units [48–51]. In the same way, a study conducted on a group of rescue workers by Jamal [2] showed a negative correlation between stress and hardiness. A study conducted on ambulance emergency workers showed that workers with high levels of hardiness have lower levels of burnout, post-traumatic stress disorder, and psychopathological consequences in general [52].

With regard to the COVID-19 pandemic, Lin et al. [53] investigated the relationships among resilience, measured by the Connor-Davidson Resilience Scale (CD-RISC), coping strategies, and mental health in a group of medical workers in Wuhan. They found that the resilience of medical workers in this study was negatively associated with levels of depression and anxiety, indicating that resilience could be a protective factor. Moreover, a positive association between resilience and positive coping was highlighted. In other words, medical workers who tend to adopt active coping techniques have higher levels of resilience.

### 1.3. The Role of Coping Strategies

Effective management of stress levels in the emergency phase could reduce the risk of developing long-term PTSD or other pathologies, such as anxiety and depression [6,54–58], and for this reason, many studies have focused on the coping strategies used by rescuers and emergency workers. Coping can be defined as a series of cognitive and behavioral efforts to manage specific internal or external questions that test or exceed individual resources [59]. Emergency workers must have sufficient self-efficacy in terms of coping skills to be able to manage and cope with stress levels. Self-efficacy for coping appears to be an effective protective factor for managing stress levels and avoiding maladaptive responses [60], as well as reducing the risk of developing PTSD from coping with traumatic events [61]. According to some authors [41,62], since emergency workers are a professional group that has to face unpredictable requests, they cannot be compared to the general population in terms of coping strategies. In this population, it is more difficult to establish which coping strategies can be considered as more effective in dealing with stressors and in reducing the risk of mental distress,

especially in unknown emergency situations for which protocols and means of intervention are lacking and the long-term effects of one's actions are unknown. Unpredictability, lack of knowledge, and, at the same time, the seriousness and extent of the phenomenon characterize the interventions of the emergency workers during the COVID-19 phases.

According to Cicognani et al. [41], those who use coping strategies aimed at solving problems perceive situations in which a high number of victims are involved as more stressful, compared to those who are more able to use the coping strategies of acceptance and cognitive restructuring. However, it should be borne in mind that the results offered by the various studies relating to the relationship between coping strategies and mental health outcomes in emergency staff are not always consistent.

The use of problem-centered coping usually tends to correlate with lower stress levels in healthcare professionals [63,64].

Other studies conducted on firefighters have found that problem-focused coping is associated both with high levels [65] and with low levels of psychological distress [66]. However, the use of cognitive and behavioral avoidance, commonly observed after trauma, is predictive of greater psychological distress between professional firefighters and ambulance staff [66–70]. Loo et al. [71] found that in a group of emergency workers, emotion avoidance and coping strategies were associated with the development of post-traumatic symptoms. Rodríguez-Rey et al. [72] revealed that among medical staff working in a pediatric emergency department, approximately 30% of the variance in PTSD was explained by the frequent use of emotion-focused coping strategies and the infrequent use of problem-focused ones. Furthermore, another study [73] showed that in 440 paramedics, the risk of developing PTSD symptoms was predictable given the use of emotion-focused coping strategies.

Other studies have shown that the use of coping focused on emotions is associated with a lower level of psychological distress [66], which is different from the search for social support for emotional reasons and emotional outbursts [74].

The literature does not contain much information about coping strategies and quality of life among emergency volunteers. Cicognani et al. [41] found that in emergency volunteers, the coping strategies most used by the sample were active coping and positive re-evaluation, followed by support/venting. Self-criticism and religion are used less frequently. Volunteer emergency workers perceive greater collective effectiveness than full-time workers; moreover, the duration of service (and the competence) is associated with greater self-efficacy and with stronger use of active coping strategies. Volunteer emergency workers therefore seem to enjoy a better quality of life and are more equipped with resources to cope with the stresses associated with rescue work than full-time staff. In a previous study [75], differences in the use of the various coping strategies were found, as the volunteer rescuers reported greater use of avoidance coping ( $p = 0.005$ ), more emotional coping ( $p = 0.06$ ), and less rational coping ( $p = 0.07$ ) compared with professionals.

Moreover, some studies have investigated the coping strategies that emergency workers can use during health emergencies similar to COVID-19. Maunder et al. [76] revealed that during the SARS epidemic, healthcare workers who tended to use coping strategies based on avoidance, hostile confrontation, or self-blame showed higher levels of stress. Also, Wong et al. [77] pointed out that during the SARS emergency, doctors tended to devote themselves more to action planning, but this strategy was not related to the stress level. On the contrary, their stress level was positively correlated with their use of outlet-based emotional coping strategies. Nursing staff, on the other hand, tended to resort more to behavioral strategies of disengagement and distraction, which were related to higher levels of stress.

During the MERS outbreak, Khalid et al. [78] highlighted that hospital staff tended to adopt active coping strategies related to the use of PPE and the adoption of all prevention measures, as well as social support. A situation similar was found in a study on health workers in Hubei, China during the COVID-19 epidemic [79], in which results highlighted that medical personnel tended to rely on active coping strategies, such as the use of security protocols, practicing social distance measures, and seeking support from family and friends, but did not find it necessary to discuss their emotions

with a professional. Huang et al. [80] found that a sample of nurses working during the COVID-19 emergency had greater emotional reactions and turned more to problem-focused coping than university nurse students.

#### 1.4. Relationship between Hardiness, Coping, and Stress

According to Ye [81], individual strengths (e.g., effective coping strategies and resilience) may explain the underlying mechanism of the association between traumatic experiences and mental health in different contexts.

The use of coping strategies and resilience can help emergency workers cope better with emergency situations, and these factors can protect them from complications caused by traumatic events [82].

Several studies on stress and hardiness showed that people with higher levels of hardiness are more likely to take part in adaptive coping approaches and fewer maladaptive coping approaches to reduce their stress levels compared with people with low levels of hardiness. Hence, individuals with a higher level of hardiness experience lower levels of stress [83,84]. Similarly, Bartone [45] revealed a relationship between hardiness and stress. The findings of this research revealed that hardiness is a defensive factor against stress-related diseases. The results of several studies reveal how hardiness, in addition to having a predictive effect, plays a mediating role on stress and mental health [50].

As highlighted above, several studies have found the protective effect of hardiness on stress and secondary trauma [2,46,47,52]. In addition, with regard to coping strategies, several studies have shown how self-efficacy for coping could be a protective factor to manage stress levels and to reduce the risk of developing post traumatic symptoms [41,60,61].

Few studies, however, have analyzed the relationships between resilience, coping strategies, and mental health on healthcare and emergency workers [53,85].

Jamal et al. [85] found that coping strategies and hardiness were predictors of stress among rescue workers and the results of their study highlighted the importance of concepts of stress, coping, and hardiness in the work environment of rescue workers, because they have to work in emergency situations and workplace stress plays an important role in their lives. Researchers such as Judkins [86] showed that stress can be reduced by adopting coping strategies and increasing the level of hardiness.

Another study [2] showed that coping is a significant mediator of the stress–hardiness relationship among rescue workers, and findings indicated that coping training of rescue workers can help them to experience a low level of stress. They can increase their level of hardiness and improve the use of effective coping strategies to cope with stressful situations. In particular, the results confirmed that an increase in hardiness would decrease stress among rescue workers and that stressful situations can be altered by hardiness into positive reassessment with negative sentiments like frustration and stress being dropped. Dayyeri et al. [87] studied the relationship between coping strategies and stress, hardiness, and self-efficacy in 291 rescue and relief workers and found significant relationships among psychological hardiness, coping strategies, and self-efficacy ( $p < 0.01$ ), as well as showing that dimensions of hardiness (commitment and struggle) have meaningful relationships with components of coping strategies ( $p < 0.01$ ).

Greinacher et al. [11] found that a group of volunteers working in a psychosocial emergency room had low levels of secondary and primary traumatization compared with a normal sample. High resilience factors were negatively correlated with traumatization; secondary traumatization was linked to higher levels of avoidant attachment and lower levels of social support.

The mediating role of coping strategies (avoidance and problem-focused) to stress in the relation between resiliency and post-traumatic growth emerged in a study on a group of paramedics, but the results allow a better understanding of the mechanisms of resiliency, whose relationship with post-traumatic growth is ambiguous [88].

In fact, although several studies focusing on the relationship between hardiness, coping, and stress on rescuers have supported the hypothesis that coping strategies would mediate the relationship between hardiness and stress among rescue workers [2], previous research has shown, in other contexts,



that hardiness and coping essentially mediate the relationship between traumatic experiences and post-traumatic adjustment [89]. Therefore, medical workers who tend to adopt active coping techniques have higher levels of resilience [53]. Furthermore, the only studies that have focused on analyzing the exposure of emergency workers to the risk of developing secondary trauma, due to high stressors experienced during COVID-19, have shown that the coping strategy that stops negative emotions and thoughts could be a protective strategy against stress and secondary trauma [28] and hardiness has emerged as a protective factor for secondary trauma [27].

Consequently, it is possible that COVID-19-related stressful experiences may affect secondary trauma symptoms through the pathway of resilience and coping strategies as mediators on rescue workers. It is also possible that they could avoid secondary traumatization due to stress by increasing levels of hardiness and ameliorating the use of effective coping strategies to cope with stressful situations.

The study by Jamal et al. [85] presents a model where hardiness and coping strategies were predictors of stress among rescue workers involved in emergency situations. The results of this study indicate that high levels of hardiness, problem-focused and avoidance coping reduce stress levels. The study analyzed only the predictive effect of hardiness and coping strategies on stress but not the possible mediating role of the stress relationship on mental illness. The present study aims to verify the mediating effect of hardiness and coping strategies in emergency workers, departing from the model proposed by Jamal et al. [85] Considering that from the studies analyzed both hardiness and coping strategies seem to have a predictive effect on stress and secondary trauma, and that some studies have found a mediating effect of hardiness or coping strategies on stress, we considered it plausible to verify in this study their simultaneous interaction with stress and secondary trauma, both in terms of predictivity and mediation.

## 2. Study Aim and Hypotheses

Given the limited data and the lack of studies in the literature, the main objective of this study was to identify the direct and mediating effects of hardiness and coping strategies activated by emergency workers on stress and secondary trauma during the COVID-19 pandemic.

According to Walton et al. [23], the main acute stress reactions of emergency workers to emergency medical situations include emotional, cognitive, physical, and social relational reactions. Therefore, these factors were included in the questionnaire used in the present study. Moreover, reactions linked to stress factors related to difficulties due to ineffective decision-making and dealing with stress were also considered [60]. In addition, fear regarding contracting the virus and infecting their own families were specifically considered [23,24,90,91].

Based on the results found in the literature, and with a view to further exploratory research, the specific objectives of this study were as follows:

1. To examine the relationships among coping strategies, emergency stress, and secondary trauma in emergency workers;
2. To analyze the predictive power of coping strategies and hardiness on the various levels of stress measured by the Emergency Stress Questionnaire by checking the models using socio-demographic variables (age and gender) and “having had personal material and protective equipment” (i.e., a variable named “PPE”);
3. To analyze the predictive power of stress factors on the levels of secondary trauma by checking the models using socio-demographic variables and availability of PPE;
4. To analyze the mediating effects of hardiness and coping strategies in reducing the effect of stress on secondary trauma.

Based on these specific objectives this study aimed to verify the following hypotheses:

**Hypothesis 1 (H1).** *We hypothesized the following correlations:*

- *Emergency stress correlates positively with secondary trauma;*
- *Emergency stress (except inefficacy decisional) correlates negatively with hardiness;*
- *Emergency stress (except inefficacy decisional) correlates negatively with coping strategies;*
- *Coping strategies correlate positively with hardiness;*
- *Coping strategies correlate negatively with secondary trauma;*
- *Hardiness correlates negatively with secondary trauma.*

**Hypothesis 2 (H2).**

- *Emergency stress positively predicts secondary trauma (intrusion, arousal, and avoidance);*
- *Coping strategies and hardiness negatively predict emergency stress.*

*Other contextual variables, such as gender, age, PPE, and working hours, were considered as control variables.*

**Hypothesis 3 (H3).** *The predictive effect of emergency stress on arousal and avoidance is mediated by hardiness and coping strategies (problem-focused and stopping unpleasant emotions and thoughts) which reduce the effect.*

### 3. Materials and Methods

#### 3.1. Participants

The sample was made up of 513 Red Cross volunteers from the Veneto Regional Committee. Two hundred and twenty participants were male (44.25%) with a mean age of 47.10 (SD = 13.51; min 17–max 75), and the remaining 286 were female (mean age = 44.49, SD 12.99; min 16–max 75). On average, the male participants were older than the female participants ( $t = 2.22$ ;  $p < 0.05$ ).

The distribution of the gender variable within the sample was significant ( $\chi^2 = 6.786$ ;  $p < 0.01$ ).

Participants were asked to indicate the average number of hours worked during the week during the pandemic period. Volunteer emergency workers worked, on average, 13.49 h per week (SD = 11.62; min 1–max 84). There was no difference between males and females in terms of length of service by week.

#### 3.2. Procedure

This study used an online questionnaire and was conducted at the beginning of the post-lockdown period. The questionnaire consisted of three parts: one each to collect online informed consent and baseline sociodemographic information and one with an online series of questionnaires, as described in the next section. Participants' anonymity was maintained while collecting the data. The institutional Ethics Committee approved all of the procedures used.

#### 3.3. Materials

In this study, we administered a series of questionnaires to evaluate the level of psychological stress, secondary trauma, hardiness, and coping style of each participant. We included the following questionnaires:

Secondary Traumatic Stress Scale—Italian Version (STSS-I) [92,93]: This instrument's 17 items allow the verification of the presence of symptoms of vicarious trauma, arousal, avoidance, and intrusion and their relative frequencies. In detail, the arousal items describe situations characterized by anxiety, confusion, physical, and psychological complaints, as well as agitation. Avoidance items describe the presence of persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness. Intrusion refers to the re-experiencing of the traumatic event—even if not directly suffered—through internal images and memories. Instructions for the STSS-I indicated that respondents should indicate how frequently an item has been true for them in the past four weeks. The statements

are evaluated on a 5-point scale (1 = never; 5 = very often) which provides scores for Intrusion (example items: “I thought about my work with victims when I did not intend to”; “Reminders of my work with clients upset me”), Arousal (example items: “I had trouble concentrating”; “I was easily annoyed”; “I expected something bad to happen”; “I felt jumpy”), and Avoidance (example items: “I had little interest in being around others”; “I wanted to avoid working with some clients”).

Different from the Italian validation [93], in this study, we considered all 17 items of the original version through three factors [92] and not only the two (arousal and intrusion) of the Italian validation. In line with this choice, we calculated the following reliability coefficients: total ( $\alpha = 0.90$ ); Arousal ( $\alpha = 0.84$ ), Avoidance ( $\alpha = 0.72$ ), and Intrusion ( $\alpha = 0.79$ ). All three factors were found to be highly correlated with each other (Arousal–Avoidance  $r = 0.77$ ,  $p < 0.001$ , Arousal–Intrusion  $r = 0.601$ ,  $p < 0.001$ , Avoidance–Intrusion  $r = 0.599$ ,  $p < 0.001$ ).

The Coping Self-Efficacy Scale—Short Form (CSES-SF) [60]: This is a 13-item measure of perceived self-efficacy for coping with challenges and threats. This measure focuses on the changes in individuals’ confidence in their ability to cope effectively, based on the self-efficacy theory [60,94]. Participants were asked, “When things are not going well for you, or when you’re having problems, how confident or certain are you that you can do the following.” Then, they were asked to rate on an 11-point scale the extent to which they believed they could perform important behaviors for adaptive coping. The instrument yields three subscale scores: problem-focused coping (for example, “Make an action plan and follow it when faced with a problem”), stopping unpleasant emotions and thoughts (“Keep your mind away from negative thoughts”), and support (“Seek moral support from friends and family”). Anchor points on the scale were 0 (“cannot do at all”), 5 (“moderately certain can do”), and 10 (“certain can do”). The alpha coefficients relating to the sample of this study were calculated: total score ( $\alpha = 0.90$ ), problem-focused ( $\alpha = 0.81$ ), stopping unpleasant emotions and thoughts ( $\alpha = 0.91$ ), and support ( $\alpha = 0.86$ ). In this study all three scales of the instrument were used in a distinct way.

Dispositional Resilience Scale-15—Italian Version (DRS-15) [95,96]: This is a self-reported questionnaire that measures hardiness. It consists of 15 items, scored on a four-point scale ranging from 0 (not at all true) to 3 (completely true). The instrument includes positively and negatively keyed items covering the three conceptually important Hardiness components: commitment, control, and challenge. Some examples of items are: “By working hard you can always achieve your goals”, or “I do not like making changes to my daily schedule”, or “When I have to do more than one thing at a time, I enjoy the challenge”. The overall score ranges from 0 to 45, with higher scores indicating a greater level of hardiness. In addition to the total score, the DRS yields scores for three subscales: commitment, control, and challenge. The coefficient alpha for the total hardiness measure was found to be 0.73 for the total score and 0.55, 0.46, and 0.74 for the Commitment, Control, and Challenge subscales, respectively [95]. We used the total DRS since the commitment and control subscales have low alpha coefficients.

Emergency Stress Questionnaire (ESQ) [27,28] (See Appendix A for the full text in the English version): The ESQ is an original self-report instrument that is already in use and was validated in previous research to assess the level of stress on healthcare and emergency workers during phase 1, the acute phase of the pandemic [27,28]. This tool was built using stress factors that emerged from an analysis of the literature linked to the situations in which emergency workers have to cope with a pandemic [97].

Analysis of the literature revealed that in situations in which emergency workers have to cope with a pandemic, several factors may affect their stress levels and COVID-19 represents an independent specific stressor [97]. The following stress factors have been identified in emergency situations: physical and emotional, cognitive, decision-making, relational, and organizational stress [4–8,23,24,92]. Focusing on the specificity of the COVID-19 epidemic, items were constructed regarding the fears of contracting the infection and of infecting colleagues or family members [23], since COVID-19 represents a factor of independent stress [97] that has a great impact [80].

The questionnaire consists of 33 items assessed on a 5-point Likert scale, with scores ranging from 0 (not at all) to 4 (very much), grouped into six scales. The participants were asked to indicate how



often they experienced certain emotions and thoughts while performing intervention and emergency activities during the COVID-19 pandemic.

The scales correspond to the factors identified and confirmed by factorial analysis through an analysis of the main components with orthogonal rotation of factors (varimax). The number of factors to be extracted was initially verified through the unit's largest eigenvalue criterion and, subsequently, by the scree test. The Confirmatory Factor Analysis (CFA) shows an adequate measure of the sampling (KMO test = 0.908, sphericity of Bartlett test = 3478.26,  $p < .001$ ) and detects an adequate saturation of the 6 factors identified from a theoretical point of view.

The ESQ is based on six subscales [27]:

1. Organizational–Relational Stress: measures the stress levels related to the organizational context, the relationship with colleagues, and social support (consisting of eight items: 7, 10, 13, 14, 15, 16, 19, and 23);
2. Physical Stress: composed of five items describing the symptoms of physical fatigue (items 11, 12, 18, 20, and 32);
3. Inefficacy Decisional Stress: consists of five items that analyze decision-making aspects and the possibility of acting related to the level of self-efficacy (items 22, 25, 27, 29, and 29);
4. Emotional Stress: comprises six items that indicate the participant's emotional reactions (items 1, 2, 3, 4, 6, and 26);
5. Cognitive Stress: consists of four items on the cognitive aspects of stress (items 5, 17, 21, and 24);
6. COVID-19 Stress: comprises five items regarding the worries related to the COVID-19 emergency (items 8, 9, 30, 31, and 33).

Items 5, 19 and 26 are in reverse. The ESQ demonstrated good internal consistency ( $\alpha = 0.93$ ) overall and also for each individual scale: Organizational–Relational Stress ( $\alpha = 0.71$ ), Physical Stress ( $\alpha = 0.82$ ), Inefficacy Decisional Stress ( $\alpha = 0.80$ ), Emotional Stress ( $\alpha = 0.86$ ), Cognitive Stress ( $\alpha = 0.72$ ), and COVID-19 Stress ( $\alpha = 0.80$ ). All the ESQ scales were positively correlated with each other (see Appendix B) [27,28] and this supports the computation of the Total Stress score, confirming that, on the theoretical level, stress refers to a complex and non-unitary concept that involves various aspects or factors.

An additional table shows the means and standard deviations of the ESQ, DRS-15, STSS-I, and CSES-SF (see Appendix B).

### 3.4. Statistical Strategy

Initially, a Pearson correlation was conducted to detect the presence of associations among all scales examined in this study. Subsequently, hierarchical linear regression models were performed to verify the predictivity of coping strategies and hardiness on stress levels. Hierarchical regression models were conducted by using the components of secondary trauma such as dependent variables and stress levels, coping strategies, and hardiness as predictors. All models were assessed by age, gender, and availability of PPE.

In order to explore the main hypothesis of this study and to assess the relationships among stress, hardiness, and coping strategies of emergency workers of the Red Cross and the mediating roles of coping strategies and hardiness on stress in producing secondary trauma, according to criteria postulated by Baron and Kenny [98] for the analysis of a mediating effect, we carried out a correlational analysis, regression analysis, and Sobel test to show whether indirect effects were significant or not [99].

## 4. Results

### 4.1. Preliminary Analysis

An initial analysis to verify Hypothesis 1 was conducted by Pearson's correlations between the variables of interest in this study: ESQ, DRS-15, STSS-I, and CSES-SF. Table 1 shows the results of these correlations. Hypothesis 1 was confirmed.

In order to look for differences in the measured variables using the scores of instruments related to gender, a series of independent samples *t*-tests were carried out. Gender differences emerged. Women showed significantly higher scores for Physical Stress (females:  $m = 6.88$ ,  $SD = 4.83$ ; males:  $m = 4.86$ ,  $SD = 4.53$ ;  $t = 4.85$ ,  $p < 0.001$ ), Emotional Stress (females:  $m = 8.33$ ,  $SD = 4.18$ ; males:  $m = 7.41$ ,  $SD = 4.69$ ;  $t = 2.35$ ,  $p < 0.05$ ), Arousal (females:  $m = 11.86$ ,  $SD = 3.99$ ; males:  $m = 9.84$ ,  $SD = 4.17$ ;  $t = 5.60$ ,  $p < 0.001$ ), Avoidance (females:  $m = 12.70$ ,  $SD = 3.56$ ; males:  $m = 11.47$ ,  $SD = 3.89$ ;  $t = 3.73$ ,  $p < 0.001$ ) and Intrusion (females:  $m = 9.69$ ,  $SD = 3.14$ ; males:  $m = 8.86$ ,  $SD = 3.28$ ;  $t = 2.89$ ,  $p < 0.01$ ). Men showed significantly higher scores for problem-focused coping strategies (males:  $m = 39.00$ ,  $SD = 6.42$ ; females:  $m = 37.82$ ,  $SD = 6.49$ ;  $t = 2.05$ ,  $p < 0.05$ ) and for Total DRS (males:  $m = 28.74$ ,  $SD = 3.58$ ; females:  $m = 27.63$ ,  $SD = 3.80$ ;  $t = 3.39$ ,  $p < 0.001$ ).

A MANOVA test was performed to verify the effect of "weekly working hours" on stress factors as dependent variables. No significant effects were found (Pillai's Trace:  $val = 0.013$ ,  $F = 1.033$ ,  $df (6, 474)$ ,  $p = n.s.$ ) Furthermore, "weekly working hours" were not shown to have significant effects on the dependent variables Arousal, Avoidance, and Intrusion, (Pillai's Trace:  $val = 0.004$ ,  $F = 0.673$ ,  $df (3, 477)$ ,  $p = n.s.$ ); coping strategies (Pillai Trace's:  $val = 0.009$ ,  $F = 1.460$ ,  $df (3, 509)$ ,  $p = n.s.$ ); or hardiness (univariate test of effects between subjects:  $F = 0.005$ ,  $p = n.s.$ ) In consideration of these results, "weekly working hours" was not considered in the subsequent analyses.

### 4.2. Results

Multiple regression analyses were conducted to verify Hypothesis 2 and to examine the predictive power of coping strategies and the hardiness scale to explain the variance in the ESQ scales, including Age, Gender (male vs. female), and Availability of PPE (see Table 2). Inefficacy Decisional Stress was found have no significant correlation with coping strategies or with Total DRS (Table 1). The regression model with Inefficacy Decisional Stress as a dependent variable was not significant and is not reported in Table 2.

As it emerged in Table 1, all stress subscales presented significant positive correlations with secondary trauma, while coping and hardiness strategies presented significant negative correlations.

Multiple regression analyses were conducted to examine the predictive power of ESQ, coping strategies, and hardiness scales on secondary trauma, including Age, Gender (male vs. female), and Availability of PPE (see Table 3). The results shown in Table 3 confirmed Hypothesis 2.

**Table 1.** Pearson’s correlation between ESQ, DRS-15, STSS-I, and CSES—SF ( $n = 513$ ).

	DRS-15		STSS-I			CSES—SF	
	Total DRS	Arousal	Avoidance	Intrusion	Problem Focused	Stop Unpleasant Emotions_Thoughts	Support
ESQ							
Organizational–Relational Stress	−0.192 ***	0.490 ***	0.416 ***	0.313 ***	−0.041	−0.157 ***	−0.001
Physical Stress	−0.298 ***	0.693 ***	0.530 ***	0.431 ***	−0.098 *	−0.319 ***	−0.105 **
Inefficacy Decisional Stress	−0.017	0.288 ***	0.278 ***	0.299 ***	0.057	−0.018	0.015
Emotional Stress	−0.325 ***	0.650 ***	0.579 ***	0.486 ***	−0.172 ***	−0.366 ***	−0.127 **
Cognitive Stress	−0.275 ***	0.511 ***	0.519 ***	0.393 ***	−0.194 ***	−0.304 ***	−0.099 *
COVID Stress	−0.127 **	0.499 ***	0.408 ***	0.522 ***	−0.071	−0.214 ***	−0.041
Total Stress	−0.272 ***	0.798 ***	0.599 ***	0.538 ***	−0.108 **	−0.303 ***	−0.078 *
Total DRS	1	−0.385 ***	−0.418 ***	−0.154 ***	0.324 ***	0.354 ***	0.281 ***
STSS-I							
Arousal	−0.385 ***	0.754 ***	0.754 ***	0.584 ***	−0.163 ***	−0.391 ***	−0.173 ***
Avoidance	−0.418 ***	0.584 ***	1	0.570 ***	−0.206 ***	−0.364 ***	−0.231 ***
Intrusion	−0.154 ***	−0.163 ***	0.570 ***	1	−0.117 **	−0.155 ***	−0.055
CSES-SF							
Problem-Focused	0.324 ***	−0.163 ***	−0.206 ***	−0.117 **	1	0.487 ***	0.303 ***
Stop Unpleasant Emotions_Thoughts	0.354 ***	−0.391 ***	−0.364 ***	−0.155 ***	0.487 ***	1	0.453 ***
Support	0.281 ***	−0.173 ***	−0.231 ***	−0.055	0.303 ***	0.453 ***	1

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; ESQ = Emergency Stress Questionnaire; DRS-15 = Dispositional Resilience Scale, STSS-I = Secondary Traumatic Stress Scale—Italian Version; CSES—SF = Coping Self-Efficacy Scale—Short Form.

**Table 2.** Hierarchical regressions on ESQ scales ( $n = 513$ ).

	Organizational– Relational Stress		Physical Stress		Emotional Stress		Cognitive Stress		Covid-19 Stress	
	B	Exp(B)	B	Exp(B)	B	Exp (B)	B	Exp (B)	B	Exp (B)
Model 1										
Age	−0.043	−0.122 **	−0.057	−0.157 ***	−0.048	−0.144 **	−0.048	−0.144 **	−0.025	−0.077
Gender <sup>1</sup>	0.325	0.035	1.951	0.202 ***	0.888	0.099 *	0.394	0.073	0.158	0.019
PPE <sup>2</sup>	3.750	0.319 ***	1.790	0.148 **	1.837	0.164 ***	1.753	0.259 ***	0.916	0.086
	$R^2 = 0.115$ F = 21.857 ***		$R^2 = 0.089$ F = 16.428 ***		$R^2 = 0.057$ F = 10.208 ***		$R^2 = 0.084$ F = 15.488 ***		$R^2 = 0.013$ F = 2.277	
Model 2										
Age	−0.037	−105 *	−0.043	−0.117 **	−0.034	−0.102 *	−0.019	−0.091 *	−0.015	−0.048
Gender	0.230	0.024	1.773	0.183 ***	0.645	0.072	0.253	0.047	0.021	0.002
PPE	3.574	0.304 ***	1.406	0.116 **	1.447	0.129 **	1.581	0.233 ***	0.659	0.062
Problem-Focused	0.015	0.021	0.058	0.078	0.001	0.002	−0.034	−0.081	0.023	0.036
Stop Unpleasant Emotions_Thoughts	−0.075	−0.156 **	−0.165	−0.332 ***	−0.162	−0.353 ***	−0.068	−0.244 ***	−0.110	−0.252 ***
Support	0.059	0.068	0.027	0.030	0.031	0.038	0.018	0.037	0.053	0.068
	$R^2 = 0.131$ $\Delta R^2 = 0.017 *$ F = 12.691 ***		$R^2 = 0.170$ $\Delta R^2 = 0.081 ***$ F = 17.139 ***		$R^2 = 0.168$ $\Delta R^2 = 0.110 ***$ F = 16.871 ***		$R^2 = 0.159$ $\Delta R^2 = 0.075 ***$ F = 15.835 ***		$R^2 = 0.058$ $\Delta R^2 = 0.045 ***$ F = 5.157 ***	
Model 3										
Age	−0.030	−0.085 *	−0.033	−0.090 *	−0.024	−0.073	−0.014	−0.069	−0.012	−0.039
Gender	0.082	0.009	1.562	0.161 ***	0.434	0.049	0.155	0.029	−0.041	−0.005
PPE	3.429	0.292 ***	1.200	0.099 *	1.240	0.111 **	1.486	0.219 ***	0.598	0.056
Problem Focused	0.035	0.048	0.086	0.115 *	0.026	0.038	−0.021	−0.050	0.031	0.048
Stop Unpleasant Emotions_Thoughts	−0.065	−0.138 **	−0.150	−0.301 ***	−0.147	−0.319 ***	−0.061	−0.219 ***	−0.105	−0.241 ***
Support	0.080	0.092 *	0.053	0.059	0.058	0.070	0.031	0.061	0.061	0.077
Total DRS	−0.177	−0.142 **	−0.252	−0.196 ***	−0.252	−0.212 ***	−0.116	−0.162 ***	−0.074	−0.065
	$R^2 = 0.150$ $\Delta R^2 = 0.016 **$ F = 12.404 ***		$R^2 = 0.200$ $\Delta R^2 = 0.030 ***$ F = 17.942 ***		$R^2 = 0.203$ $\Delta R^2 = 0.036 ***$ F = 18.293 ***		$R^2 = 0.180$ $\Delta R^2 = 0.021 ***$ F = 15.702 ***		$R^2 = 0.061$ $\Delta R^2 = 0.003$ F = 4.687 ***	

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; <sup>1</sup> gender: 1 = male; 2 = female; <sup>2</sup> PPE: 1 = presence; 2 = lack; ESQ = Emergency Stress Questionnaire; Total DRS = Total Dispositional Resilience Scale.

**Table 3.** Hierarchical regressions of Arousal, Avoidance, and Intrusion ( $n = 513$ ).

	Arousal		Avoidance		Intrusion	
	Exp (B)	B	Exp (B)	B	Exp (B)	B
Model 1						
Age	−0.045	−0.143 **	−0.004	−0.015	0.029	0.119 **
Gender <sup>1</sup>	1.974	0.235 ***	1.309	0.174 ***	0.923	0.142 **
PPE <sup>2</sup>	1.861	0.177 ***	1.894	0.201 ***	0.565	0.070
	$R^2 = 0.108$		$R^2 = 0.068$		$R^2 = 0.036$	
	$F = 20.356 ***$		$F = 12.289 ***$		$F = 6.237 ***$	
Model 2						
Age	−0.006	−0.019	0.025	0.089 **	0.050	0.206 ***
Gender	0.945	0.112 ***	0.596	0.079 *	0.485	0.075 *
PPE	0.573	0.055	0.763	0.081 *	−0.147	−0.018
Organizational–Relational Stress	−0.043	−0.048	−0.072	−0.090	−0.071	−0.102 *
Physical Stress	0.369	0.425 ***	0.187	−0.240 ***	0.110	0.164 **
Inefficacy Decisional Stress	−0.052	−0.048	−0.017	−0.017	0.067	0.078
Emotional Stress	0.320	0.341 ***	0.285	0.338 ***	0.177	0.243 ***
Cognitive Stress	0.054	0.035	0.282	0.203 ***	0.128	0.107 *
Covid-19 Stress	0.116	0.117 **	0.057	0.064	0.252	0.329 ***
	$R^2 = 0.610$		$R^2 = 0.444$		$R^2 = 0.401$	
	$\Delta R^2 = 0.502 ***$		$\Delta R^2 = 0.376 ***$		$\Delta R^2 = 0.366 ***$	
	$F = 97.800 ***$		$F = 50.038 ***$		$F = 41.980 ***$	
Model 3						
Age	0.000	0.000	0.032	0.114 **	0.049	0.200 ***
Gender	0.890	0.106 ***	0.508	0.067 *	0.464	0.071 *
PPE	0.441	0.042	0.626	0.062	−0.097	−0.012
Organizational–Relational Stress	−0.013	−0.015	−0.035	−0.044	−0.079	−0.115 *
Physical Stress	0.334	0.385 ***	0.147	0.189 ***	0.122	0.182 ***
Inefficacy Decisional Stress	−0.020	−0.018	0.028	0.029	0.064	0.077 *
Emotional Stress	0.270	0.287 ***	0.222	0.263 ***	0.189	0.261 ***
Cognitive Stress	0.024	0.015	0.237	0.171 ***	0.129	0.107 *
Covid-19 Stress	0.127	0.129 ***	0.078	0.088 *	0.254	0.331 ***
Problem Focused	0.023	0.036	0.010	0.018	−0.025	−0.051
Stop Unpleasant Emotions_Thoughts	−0.039	−0.090 *	−0.020	−0.052	−0.032	−0.094 *
Support	−0.016	−0.021	−0.057	−0.081 *	−0.005	−0.008
Total DRS	−0.130	−0.117 ***	−0.196	−0.198 ***	−0.006	−0.007
	$R^2 = 0.631$		$R^2 = 0.496$		$R^2 = 0.407$	
	$\Delta R^2 = 0.021 ***$		$\Delta R^2 = 0.052 ***$		$\Delta R^2 = 0.005$	
	$F = 70.709 ***$		$F = 40.748 ***$		$F = 28.398 ***$	

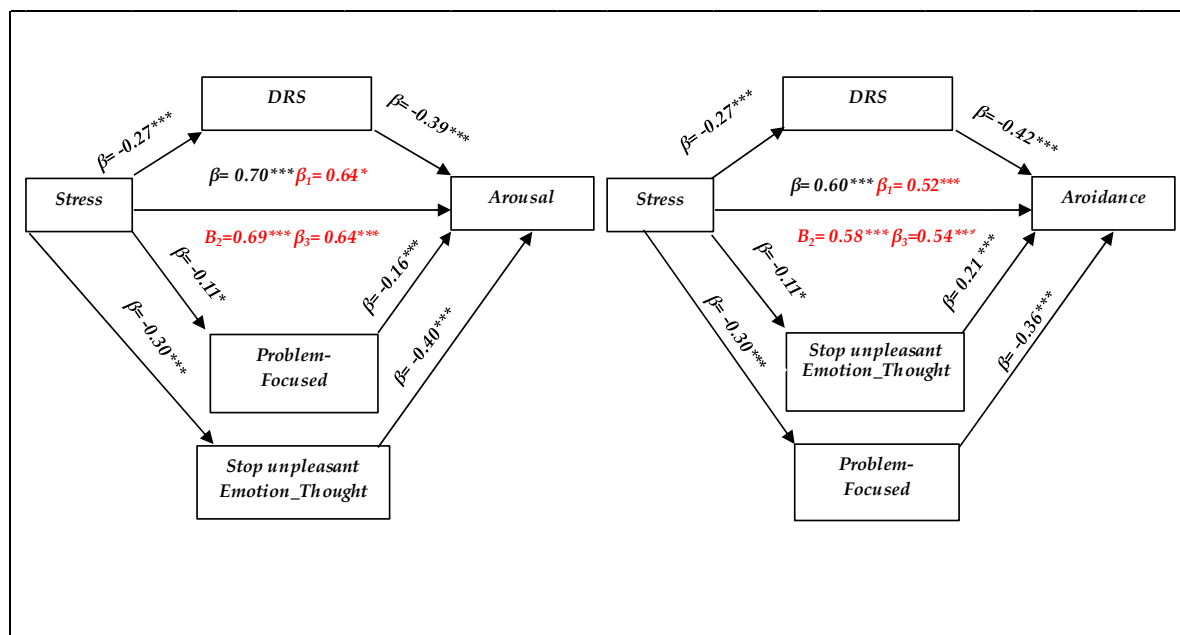
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; <sup>1</sup> gender: 1 = male; 2 = female; <sup>2</sup> PPE: 1 = presence; 2 = lack; ESQ = Emergency Stress Questionnaire; Total DRS = Total Dispositional Resilience Scale.



Regression analyses were performed in order to investigate whether hardiness and coping strategies are stress mediators on secondary trauma, and a Sobel test was conducted to test the mediating criteria and to assess whether indirect effects are significant or not [99] (Hypothesis 3).

Since all the ESQ scales were predictors of the three components of secondary trauma in the mediation model, Total Stress was used as a predictor (at the end of paper, the results of the individual regressions are reported as additional analyzes).

In the first mediation model, Total Stress was assumed to be an independent variable, Total DRS and coping strategies were mediators, and Arousal was used as a dependent variable (see Figure 1).



**Figure 1.** Mediation model showing that the effect of stress (independent variable) is mediated by hardiness and coping strategies (mediators). Changes in beta weights when the mediator is present are highlighted in red, \*  $p < 0.05$ , \*\*\*  $p < 0.001$ .

The regression models showed that Total Stress was a significant predictor of Arousal ( $B = 0.156$ ,  $\beta = 0.698$ ,  $t = 22.02$ ,  $p < 0.001$ ,  $R^2 = 0.487$ ,  $F = 484.783$ ). Furthermore, Total Stress was found to have predictive effects on Total DRS ( $B = -0.054$ ,  $\beta = -0.272$ ,  $t = -6.40$ ,  $p < 0.001$ ,  $R^2 = 0.074$ ,  $F = 40.909$ ), Problem-Focused Coping ( $B = -0.038$ ,  $\beta = -0.108$ ,  $t = -2.45$ ,  $p < 0.05$ ,  $R^2 = 0.012$ ,  $F = 6.080$ ), and Stop Unpleasant Emotions—Thoughts ( $B = -0.156$ ,  $\beta = -0.303$ ,  $t = -7.19$ ,  $p < 0.001$ ,  $R^2 = 0.092$ ,  $F = 1.711$ ). Total Stress was not shown to be a significant predictor of support coping, and therefore it was excluded from the model.

Mediators were found to be significant predictors of arousal, as follows: Total DRS ( $B = -0.431$ ,  $\beta = -0.385$ ,  $t = -9.43$ ,  $p < 0.001$ ,  $R^2 = 0.148$ ,  $F = 89.001$ ), Problem-Focused Coping ( $B = -0.105$ ,  $\beta = -0.163$ ,  $t = -3.73$ ,  $p < 0.001$ ,  $R^2 = 0.027$ ,  $F = 13.938$ ) and Stop Unpleasant Emotions—Thoughts ( $B = -0.170$ ,  $\beta = -0.391$ ,  $t = -9.61$ ,  $p < 0.001$ ,  $R^2 = 0.153$ ,  $F = 92.405$ ).

The Sobel test detected significance in the model when Total DRS was used as a mediator ( $Z = 4.48$ ,  $p < 0.001$ ,  $EM = 0.013$ ), reducing the effect of Total Stress on Arousal ( $B = -0.143$ ,  $\beta = -0.640$ ,  $t = 20.25$ ,  $p < 0.001$ ). The Total Stress effect was also found to be mediated by Problem-Focused Coping ( $B = 0.154$ ,  $\beta = 0.688$ ,  $t = 21.73$ ,  $p < 0.001$ ,  $Z = 1.99$ ,  $p < 0.05$ ,  $EM = 0.002$ ) and Stop Unpleasant Emotions—Thoughts ( $B = 0.143$ ,  $\beta = 0.638$ ,  $t = 19.86$ ,  $p < 0.001$ ,  $Z = 4.64$ ,  $p < 0.001$ ,  $EM = 0.013$ ). Eighteen percent of the Total Stress effect on arousal was found to be mediated by hardiness and coping strategies.

In the second mediation model, Avoidance was shown to be a dependent variable and only Total Stress ( $B = 0.120$ ,  $\beta = 0.599$ ,  $t = 16.91$ ,  $p < 0.001$ ,  $R^2 = 0.359$ ,  $F = 286.061$ ), Total DRS ( $B = -0.420$ ,  $\beta = -0.418$ ,  $t = -10.41$ ,  $p < 0.001$ ,  $R^2 = 0.175$ ,  $F = 108.333$ ), Problem-Focused ( $B = -0.120$ ,  $\beta = -0.206$ ,

$t = -4.77, p < 0.001, R^2 = 0.043, F = 22.727$ ), and Stop Unpleasant Emotions—Thoughts ( $B = -0.142, \beta = -0.364, t = -8.84, p < 0.001, R^2 = 0.133, F = 78.161$ ) emerged as significant factors.

A Sobel test was conducted to test the criteria mediating hardiness and coping strategies to assess whether indirect effects were significant or not. In the pathway of Avoidance, Total Stress was assumed to be an independent variable, and total DRS, Problem-Focused, and Stop Unpleasant Emotions—Thoughts were considered mediators. The Total Stress effect was reduced by Total DRS mediation ( $B = 0.105, \beta = 0.524, t = 15.07, p < 0.001, Z = -4.70, p < 0.001, EM = 0.015$ ), Problem-Focused ( $B = 0.117, \beta = 0.584, t = 16.63, p < 0.001, Z = 2.16, p < 0.05, EM = 0.003$ ), and Stop Unpleasant Emotions—Thoughts ( $B = 0.108, \beta = 0.538, t = 14.90, p < 0.001, Z = 4.38, p < 0.001, EM = 0.012$ ) (see Figure 1). Twenty-five percent of the Total Stress effect on Avoidance was found to be mediated by hardiness and coping strategies.

When Intrusion was used as a dependent variable, Total Stress ( $B = 0.093, \beta = 0.538, t = 14.32, p < 0.001, R^2 = 0.290, F = 208.288$ ), Total DRS ( $B = -0.133, \beta = -0.154, t = -3.53, p < 0.05, R^2 = 0.024, F = 12.488$ ), Problem-Focused ( $B = -0.058, \beta = -0.117, t = -2.66, p < 0.01, R^2 = 0.014, F = 7.099$ ), and Stop Unpleasant Emotions—Thoughts ( $B = -0.052, \beta = -0.155, t = -3.55, p < 0.001, R^2 = 0.024, F = 12.605$ ) were assumed to be predictors. The Sobel tests with total DRS, Problem-Focused and Stop Unpleasant Emotions—Thoughts were not found to be significant. The analyses carried out confirmed Hypothesis 3, showing a mediator role of hardiness and coping strategies.

## 5. Discussion

In accordance with other studies, the results presented reveal that emergency volunteers involved in various rescue activities during COVID-19 phase 2 are at risk of developing important stress reactions that are associated with and related to manifestations of secondary traumatization [2,6,27,28]. The voluntary emergency workers of the Italian Red Cross are highly specialized and continuously trained staff who play an institutional role in the organization of the Italian rescue and emergency system, for which they are considered professional emergency workers [11]. High stress reactions, associated with manifestations of arousal, avoidance, and intrusion of secondary trauma, therefore, appear to be linked to the characteristics of the pandemic and not to possible factors of inexperience. In accordance with Reinhard and Maercker [12], it would not be so much the type of event to which they were exposed that would lead the emergency workers to develop symptomatic manifestations, but rather, the sense of helplessness and horror perceived during the rescue operations.

In fact, the above results show that the hours of weekly rescue activities do not seem to have an impact on the stress levels or symptomatic manifestations of secondary trauma. In other words, even those who have worked a few hours a week to carry out emergency interventions seem to have developed similar reactions of stress and secondary trauma, probably because they are exposed to a sense of helplessness and gravity, given the high number of patients and deaths from this pandemic in Italy.

Symptoms of stress and secondary trauma have also been observed in staff working on the secondary line, not only in those employed on the front line [100], showing that intervention in this type of emergency is a possible source of risk.

In terms of the response to stressors experienced in the rescue phases, the present study found gender differences: women showed significantly higher scores in terms of physical and emotional stress, as is also evident from other studies [6,14,15]. In terms of predictivity, however, an effect linked to the gender variable only in terms of physical stress was found. When coping strategies were considered in the model, the effect on emotional stress was lost.

Women also show higher STS symptoms than males, as suggested by the literature [11,16], making them more vulnerable to secondary traumatization. The results displayed in Table 3 show a predictive effect of the gender variable at the level of symptomatic manifestations of Arousal, Avoidance, and Intrusion.

Age was found to have a negative predictive effect on physical and organizational–relational stress which was associated with a negative predictive effect of the problem focused coping strategy. The association of age with a problem-oriented adaptation strategy is likely to lead to a reduction in these stressors.

The associations of age with hardiness, coping strategies, and stress also show a positive predictive effect on the components of secondary trauma, avoidance and intrusion. According to Hou et al. [101], the mental health of middle-aged workers highly depends on factors such as feelings of self-fulfillment and personal growth and therefore on resilience. These variables were not considered in this study.

The effect of the age factor on the components of secondary trauma seems to be greater in phase 2 than in phase 1 of the pandemic [27,28]. This could indicate that the greater experience of the emergency workers, having overcome a first phase of unpredictability, novelty, and lack of clear intervention protocols, allowed them to activate greater internal resources, which acted as a protective factor with respect to stress levels and the risk of developing secondary trauma.

The present study also found a significant impact of another factor on stress levels: the absence of PPE. The results shown in Table 2 also indicate that the lack of necessary PPE was also assumed to be a predictive factor. The absence of PPE is to be considered a risk factor for the development of stress reactions, but it does not seem to have a direct effect in generating reactions from secondary traumatization.

Above all, a lack of PPE was found to affect the sense of correct decision making and the emotional sphere, and it seems to determine organizational and relational conflicts. These results converge with those of other studies that have highlighted how a lack of adequate equipment for emergency staff when dealing with COVID-19 affected their self-efficacy and the protective factors of stress. Conversely, emergency workers who were provided with the necessary equipment were more resilient during the emergency response [23,24,27,28,90,91]. A lack of specific equipment in emergency situations along with the risk of infection increases the feeling of poor control, leading to cognitive and emotional stress and a sense of ineffectiveness [23,102]. The fear of infecting themselves and their families is a specific stressor of this pandemic which has influenced health workers' emotions and professional performance [103] and it may have also affected emergency workers.

Other studies [28,79] have found an effect of the absence of PPE on stress levels in health and emergency workers, since the absence of PPE increases the risk of infection from viruses. The partial divergence of the results of this study is probably due to the fact that in the acute phase, emergency workers experienced a higher risk of contracting the disease, while in phase 2, they may have activated strategies deemed to be effective and reassuring. The incidence of this deficiency was found to be contained and limited by the use of coping strategies.

Indeed, the results of this study show that the absence of PPE has an effect on stress levels; however, it is necessary to highlight that the severity and extent of the responses to distress and secondary trauma are contained and limited by the intervention of coping and, in particular, by the stop unpleasant emotions and thoughts strategy and hardiness.

The literature recognizes that emergency workers with high levels of hardiness and resilience present low levels of stress and have a lower risk of developing psychopathological manifestations [2,45–51]. According to several studies, hardiness and resilience also play protective roles against secondary traumatization [27,34–37].

The results obtained in this study, confirming Hypothesis 1, highlight that the hardiness of voluntary emergency workers is negatively correlated with the scale of secondary trauma and at the same time is positively associated with coping strategies. Furthermore, Hypothesis 2 was also confirmed, and with respect to stress levels, hardiness, together with coping strategies, has a negative effect, thus playing a protective role by reducing the risk of dysfunctional distress reactions occurring in emergency workers (see Table 2). A similar effect, combined with the presence of coping strategies, was recorded with respect to the Arousal and Avoidance scales of secondary trauma, where a reduction of the effect brought about by stress in determining the severity of symptomatic manifestations occurs.

The models presented in Table 3 explain 63% and 50% of the variance in Arousal and Avoidance, respectively. The combined effect of coping strategies and hardiness therefore seems to reduce the risk of developing far more serious post-traumatic conditions. According to Vagni et al. [27,28], the coping strategy that has been most effectively used by emergency workers in managing intervention situations during the pandemic phases is stop unpleasant emotions and thoughts. Similar results were found by Haraldsdóttir et al. [75] who highlighted that voluntary staff, compared to professional emergency workers, use more avoidance strategies and less rational coping ones.

In fact, the use of the stop unpleasant emotions and thoughts strategy reduces the level of secondary trauma. Fraccaroli and Balducci [7] suggested that in situations of high emergency stress, emergency workers may have a deficit in the cognitive processing of emotions, thus failing to identify their emotional reactions, which tends to be associated with maladaptive behaviors. The lack of complete recognition of one's unpleasant emotions, which tend to be denied and dismissed as a coping strategy, explains the greater predictive impacts of cognitive stress and physical stress on post-traumatic arousal compared with emotional stress. In fact, in this study, this strategy was found to be effective for reducing the hyperactivation and intrusiveness aspects of images, thoughts, and memories linked to traumatic events. The literature points out how avoidant coping strategies tend to present themselves when emergency workers experience fatigue and exhaustion, and this can explain the presence of greater acute stress responses in healthcare personnel [76,104]. Further, the results of this study highlight how the stop unpleasant emotions and thoughts strategy has an inhibitory and therefore effective and highly significant impact on all stress levels analyzed.

In particular, it is important to highlight that this coping strategy is particularly used to cope with the fear of being infected by the virus and infecting family members after having operated in the absence of adequate equipment. In fact, the use of this strategy makes it possible to remove negative emotions and thoughts, allowing emergency workers to orient themselves when performing concrete interventions. In any case, it is necessary to consider how the use of coping strategies is supported by the ability of hardiness, and vice versa. In other words, the results of this study highlight that the reduction of the risk factors of distress and secondary trauma must be seen as being due to the association of coping strategies with hardiness.

The results of this study highlight a further aspect: in phase 1 of the COVID-19 pandemic, the use of other coping strategies did not seem to have an effective protective effect with respect to stress and secondary trauma [28]. However, in phase 2, the effects of other coping strategies, such as problem-focused coping and support, emerged. This is likely to be the result of the fact that in phase 1, the workers were dealing with an emergency that was not yet fully understood in terms of the procedures and prevention measures. In phase 2, on the one hand, there was greater knowledge of the phenomenon and the intervention protocols and, on the other hand, resumption of family relationships was allowed (albeit limited to within one's own region of residence and avoiding big groups). In other words, in phase 2, the emergency workers were able to count on other internal and external resources, such as the experience gained in phase 1, the identification of an intervention protocol, and greater family support. In fact, in the present study, problem-focused coping showed a reductive effect of physical stress, while support showed a reductive effect on the avoidance aspects of secondary trauma. However, it should be noted that the effects of these coping strategies recorded in phase 2 were limited. In this sense, Cicognani et al. [41] highlighted that situations with high numbers of victims are experienced as particularly stressful by those who resort to problem solving strategies. In the sample of this study, the problem-focused strategy was more frequently used by men than by women. It should be considered that the results presented only refer to a region of Italy, albeit one that was very involved in the pandemic and, at present, few studies have taken voluntary staff into consideration.

The results obtained in the present study show that hardiness has a negative effect on all stressors and secondary trauma, acting as a protective factor. Compared to coping strategies, it was observed that stopping unpleasant emotions and thoughts also has a negative effect on the various stress factors and

secondary trauma (with the exception of Avoidance where no significance was shown). This suggests that the use of this coping strategy in the acute [28] and sub-acute phases of the pandemic is effective for preventing rescuers from undergoing negative, distressing emotional activations linked to memories of death or fear of the risk of being infected, while also avoiding emotional overload and brooding. In this way, the rescuers seem to be pushed to promote active attitudes and carry out the rescue actions. On the aspects of avoidance, the coping support strategy, referring to the ability to request help from friends and family in times of difficulty and need, seems to be more effective.

The problem-focused strategy has a positive effect on physical stress only. First of all, it is necessary to highlight how the problem-focused coping strategy is mostly used by men, while women generally tend to put particular emphasis on the emotional aspects of the situations faced. High levels of physical stress can be associated with the development of psychosomatic diseases. The positive effect of the problem-focused strategy on physical stress can be understood as a difficulty in recognizing one's limits or emotional difficulties, effectively limiting one's ability to raise awareness of one's own experiences. This could be associated with an increased risk of developing psychosomatic manifestations. In other words, the tendency to be active, engaged, and operational ("Find solutions to your most difficult problems" and "Try other solutions to your problems if your first solutions do not work") can be associated with physical fatigue.

It should also be noted that the problem-focused strategy assumes that physical stress has predictive significance when hardiness is also considered in the model. These results may indicate, as suggested by other studies [66,105], that hardiness, when associated with the problem-focused strategy, can help emergency workers to perceive themselves as being actively involved and inclined to solve difficult problems, pushing themselves to levels of activity that cause physical exhaustion and fatigue.

The synergic intervention of hardiness with the problem-focused strategy could explain why this coping strategy does not directly predict the components of vicariant trauma, while, albeit to a limited extent, it acts as a stress mediator on arousal and avoidance, mitigating the negative effect.

The coping support strategy described in the present study appears to have a marginal effect on stressors and secondary traumatization factors. The use of this strategy seems to be associated with high levels of organizational–relational stress. It is probable that during pandemic emergencies, requesting support from colleagues may lead to further situations of tension, frustration, and disappointment as all emergency workers are in situations of physical and emotional overload. However, this is a correlational association and not a predictive effect.

The results in Table 3 show that support coping is a negative predictor of the avoidance aspects of secondary trauma, because the search for contact or situations of emotional closeness during COVID-19 reduces the activation of those avoidance mechanisms. Support does not appear to mediate the relationship between stress and secondary trauma.

As noted in other studies, hardiness and coping strategies have a mediating role in reducing the risk of developing high levels of stress and post-traumatic symptoms. In this study, their mediating effect in a single model was verified, considering also their correlations and predictions reported in Tables 1–3.

As highlighted in this study, and in accordance with what has been found by other authors [2,82,84,85], hardiness, the problem-focused, and stop unpleasant emotions and thoughts coping strategies intervene with stress by reducing its effect on the arousal and avoidance components of secondary trauma, and in this sense, they perform a mediating function. The combined mediated effect of hardiness and coping strategies reduces the effect of stress on Arousal by 18% and on Avoidance by 25%, and these results confirmed Hypothesis 3 of this study.

For the Intrusion component of secondary trauma, no mediation effect was shown, and in this regard, it should also be noted that, despite the significant negative correlation with hardiness and coping strategies, these variables were found to have a poor predictive effect on post-traumatic intrusiveness. It is probable that intrusive aspects of a secondary post-traumatic nature in emergency workers tend to develop or be particularly intrusive in subsequent or long-term phases.



It should be noted that previous studies that have found the mediating effect of hardiness or resilience and coping strategies on stress and secondary trauma refer, in most cases, to detections that occurred after some time from the emergency situation. In the present study, on the contrary, the collection of data and the detection of the effects between the variables took place during the emergency situation itself. This has the advantage of having an immediate response framework to the unexpected emergency condition, but there is also the risk that some personal resources have not had the time necessary to be activated in a functional and adaptive way, thus limiting the scope of the obtained results.

The model proposed in this study, although based on previous studies concerning emergency workers [80], needs to improve both its structuring as well as further analysis of possible relationship models, also identifying other possible variables, which may intervene in the structuring process of secondary trauma and which may act as protective factors such as, for example, self-efficacy.

## 6. Conclusions

The present study highlights hardiness and coping strategies as mediators that help to reduce the predictive effect of stress on secondary trauma. Hardiness allows one to activate necessary internal resources, giving emergency workers the ability to be active, to feel resistant, and to be proactive in resolving difficulties. The power of hardiness in decreasing the risk of psychopathological consequences associated with high levels of stress seems to be greater when associated with coping strategies such as stopping unpleasant emotions and thoughts, and problem-focused coping.

The activation of the stop unpleasant emotions and thoughts strategy allows emergency volunteers to perceive the invasiveness of their experiences, memories, moods, and negative thoughts. If this is not the case, it is probable that the emergency workers will feel overwhelmed and their sense of helplessness and post-traumatic emotional overload may negatively affect the effectiveness of their interventions.

This study has several limitations. The first concerns the sampling method, and the second is that our study involved participants from only one region of Northern Italy, Veneto. This region was among the most affected by COVID-19, and this could be a geographical limit, because in other regions of Italy, the pandemic situation was not as serious. The third limitation was the involvement of only a single emergency organization, the Red Cross. A comparison with other associations could be done in future work to verify whether there are different impacts in terms of the management of the protection and prevention of mental health on volunteers exposed to different training programs. A longitudinal study is recommended for future studies to acquire more detailed long-term consequences and information about the mental health of emergency volunteers. Our results suggest that specific monitoring programs and interventions are important for emergency workers and that the use of training programs should be promoted to develop protective factors to avoid the risk of secondary trauma.

The reality of emergency workers described in this study in Italy appears to be similar to that of other countries. Studies conducted in other European countries, and especially in Spain, have highlighted a high risk of health and emergency workers developing symptoms of secondary trauma. In particular, a cross-sectional study on healthcare workers in Spain, which also included ambulance personnel [106], shows a significant psychological impact of the COVID-19 pandemic on their psychological wellbeing and states that the stress level perceived is predominant in workers that are in direct contact with COVID-19 patients. Spanish emergency workers showed a higher level of stress, along with tertiary hospital workers, when compared to other groups, and seniority resulted as a protective factor. Our results are similar to the Spanish ones [107]: in most cases healthcare and emergency workers present symptoms of post-traumatic stress disorder and females have a predictive effect concerning symptomatic manifestations.

In the Spanish study, the associations between post-traumatic stress and resilience were analyzed and the latter variable proved to be a protective factor, as in the Italian scenario. These above results

are in line with those that emerged in our study and this would allow us to extend them to other European countries with characteristics similar to Italy.

The results of this study highlight how taking care of the mental health of emergency workers is essential to coping effectively with the COVID-19 pandemic. Just as the importance of interventions focused on worry and negative emotions was highlighted in the general population [108], this means all the more reason emergency workers must be protected, minimizing risks and providing them with resources and support that can foster their resilience and coping skills.

The results of this study could help to better understand the psychological consequences of the effort that healthcare professionals have made in the face of the unexpected and dramatic coronavirus outbreak. In addition, the outcomes may also help design mental health prevention and care interventions for workers. Taking into account that hardiness and coping are presented as possible protective factors of symptoms of post-traumatic stress disorder, the implementation of psychological training to promote resilience and coping strategies among emergency workers is necessary. In fact, psychological intervention focused on emergency workers should be a part of training to reduce the impact of stress not only on their well-being but also on the health system in general. This study makes an important contribution to a better understanding of the pathways through which stress correlates to traumatic events. It also shows specifically that COVID-19-related stressful experiences in rescue and/or emergency workers are linked to secondary trauma. The study suggests the utility of programming future tailored psychological prevention and support interventions focused on increasing protective factors, such as coping and resilience. It also responds to the need to promote studies, as suggested by Pagnini et al. [108], that add information which could help to guide health authorities in providing informed interventions and clear communications.

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## Appendix A

**Table A1.** EMERGENCY STRESS QUESTIONNAIRE (ESQ; Vagni, Maiorano, Giostra, Pajardi, 2020).

EMERGENCY STRESS QUESTIONNAIRE (ESQ; Vagni, Maiorano, Giostra, Pajardi, 2020)					
The following questions refer specifically to your intervention during the Covid-19 emergency. Please consider that there are no right or wrong answers and it is important that you answer all questions. In answering the following questions, 0 corresponds to “NOT AT ALL” and 4 to “VERY”. Please mark only one number. Thank you for your collaboration.					
	NOT AT ALL		VERY		
1. Did you feel agitated during your work/shift?	0	1	2	3	4
2. Do you think you were not able to keep everything under control as you would have liked?	0	1	2	3	4
3. Did you feel more nervous or irritable than usual?	0	1	2	3	4
4. During your work, did you feel pressure trying to do your job to the best of your ability?	0	1	2	3	4
5. During the various activities to what extent did you have the perception that things were going according to your expectations?	0	1	2	3	4
6. In time spent outside your work, were there any situations that irritated you?	0	1	2	3	4
7. Did you get angry at someone else's actions or reactions?	0	1	2	3	4
8. Did you find yourself rethinking about what had happened?	0	1	2	3	4
9. Are there any images of what happened that come back to your mind involuntarily?	0	1	2	3	4
10. Did you notice any tension within your work team?	0	1	2	3	4
11. Did you feel any physical tiredness?	0	1	2	3	4
12. Did you feel any muscle tension?	0	1	2	3	4

Table A1. Cont.

EMERGENCY STRESS QUESTIONNAIRE (ESQ; Vagni, Maiorano, Giostra, Pajardi, 2020)						
The following questions refer specifically to your intervention during the Covid-19 emergency. Please consider that there are no right or wrong answers and it is important that you answer all questions. In answering the following questions, 0 corresponds to “NOT AT ALL” and 4 to “VERY”. Please mark only one number. Thank you for your collaboration.						
	NOT AT ALL			VERY		
13. At work did you notice any tension in your relationship with others?	0	1	2	3	4	
14. Did you feel team spirit?	0	1	2	3	4	
15. Did you perceive that your professional experience was in contrast with the work organization set up for the Covid-19 emergency?	0	1	2	3	4	
16. Did you receive pressure (or criticism) from colleagues or superiors about how you did your job?	0	1	2	3	4	
17. Did you have difficulty concentrating at times?	0	1	2	3	4	
18. Did you ever have stomach ache?	0	1	2	3	4	
19. Were the provisions and indications for intervention timely?	0	1	2	3	4	
20. Did you ever have headaches?	0	1	2	3	4	
21. Do you regret some decisions you took because you had no choice?	0	1	2	3	4	
22. Were you not always able to predict accurately all the effects of your decisions/interventions?	0	1	2	3	4	
23. Do you think that coordination between the various professional figures was more difficult than expected?	0	1	2	3	4	
24. Would you have acted differently on retrospect?	0	1	2	3	4	
25. Did you find yourself doing things you had never done before?	0	1	2	3	4	
26. Are you fully satisfied with how you worked?	0	1	2	3	4	
27. Did you find yourself working in unpredictable circumstances?	0	1	2	3	4	
28. Did you try to carry out your tasks perfectly but take longer to decide/execute?	0	1	2	3	4	
29. Given the conditions in which you found yourself working, did you have to take decisions intuitively/instinctively, having little time available to reflect and ponder the choices?	0	1	2	3	4	
30. Did you worry about putting your family/loved ones at risk of contagion because of your job?	0	1	2	3	4	
31. Were you afraid of getting infected because of your job?	0	1	2	3	4	
32. Did you have sleep disturbances (e.g., insomnia, difficulty falling asleep, early awakening)?	0	1	2	3	4	
33. Did you worry that your colleagues have contracted or may contract the infection?	0	1	2	3	4	

## Appendix B

Table A2. Intercorrelations between the scales of the ESQ.

	Organizational-Relational	Physical Stress	Inefficacy Decisional Stress	Emotional Stress	Cognitive Stress	Covid Stress
Organizational-Relational Stress	1	0.499 ***	0.552 ***	0.632 ***	0.647 ***	0.467 ***
Physical Stress	0.499 ***	1	0.429 ***	0.582 ***	0.578 ***	0.544 ***
Inefficacy Decisional Stress	0.552 ***	0.429 ***	1	0.602 ***	0.565 ***	0.435 ***
Emotional Stress	0.632 ***	0.582 ***	0.602 ***	1	0.681 ***	0.535 ***
Cognitive Stress	0.647 ***	0.578 ***	0.565 ***	0.681 ***	1	0.533 ***
COVID Stress	0.467 ***	0.544 ***	0.435 ***	0.535 ***	0.533 ***	1

\*\*\*  $p < 0.001$ .

## Additional Analysis

This additional table shows means and standard deviations from the ESQ, DRS-15, STSS-I, and CSES-SF.

Table A3. Means and standard deviations of the ESQ, DRS-15, STSS-I, and CSES-SF ( $n = 513$ ).

	Mean (SD, Min–Max)
ESQ	
Organizational-Relational Stress	11.81 (4.66, 4–30)
Physical Stress	5.99 (4.81, 0–20)
Inefficacy Decisional Stress	8.93 (3.81, 0–20)
Emotional Stress	7.92 (4.43, 0–20)
Cognitive Stress	4.51 (2.69, 0–14)
COVID-19 Stress	10.13 (4.22, 0–20)
Total Stress	49.30 (18.73, 5–111)

Table A3. Cont.

	Mean (SD, Min–Max)
<b>DRS-15</b>	
Total DRS	28.12 (3.74, 14–37)
<b>STSS-I</b>	
Arousal	10.97 (4.19, 5–24)
Avoidance	12.16 (3.75, 5–25)
Intrusion	9.32 (3.23, 5–17)
<b>CSES—SF</b>	
Problem focused	38.34 (6.48, 22–50)
Stop unpleasant emotion—thought	35.81 (9.63, 11–50)
Support	21.58 (5.37, 4–30)

Furthermore, regression models were performed to test the predictive effect of the stress scales on components of secondary trauma.

Organizational–relational ( $B = 0.440$ ,  $\beta = 0.490$ ,  $t = 12.69$ ,  $p < 0.001$ ,  $R^2 = 0.240$ ,  $F = 161.095$ ), Physical ( $B = 0.604$ ,  $\beta = 0.693$ ,  $t = 21.75$ ,  $p < 0.001$ ,  $R^2 = 0.481$ ,  $F = 473.169$ ), Inefficacy decisional ( $B = 0.317$ ,  $\beta = 0.288$ ,  $t = 6.81$ ,  $p < 0.001$ ,  $R^2 = 0.083$ ,  $F = 46.357$ ), Emotional ( $B = 0.614$ ,  $\beta = 0.650$ ,  $t = 19.35$ ,  $p < 0.001$ ,  $R^2 = 0.423$ ,  $F = 374.333$ ), Cognitive ( $B = 0.796$ ,  $\beta = 0.511$ ,  $t = 13.44$ ,  $p < 0.001$ ,  $R^2 = 0.261$ ,  $F = 180.532$ ), and Covid ( $B = 0.495$ ,  $\beta = 0.499$ ,  $t = 13.01$ ,  $p < 0.001$ ,  $R^2 = 0.249$ ,  $F = 169.283$ ) emerged as significant predictors of Arousal.

Organizational–relational ( $B = 0.335$ ,  $\beta = 0.416$ ,  $t = 120.35$ ,  $p < 0.001$ ,  $R^2 = 0.173$ ,  $F = 107.055$ ), Physical ( $B = 0.414$ ,  $\beta = 0.530$ ,  $t = 14.12$ ,  $p < 0.001$ ,  $R^2 = 0.281$ ,  $F = 199.462$ ), Inefficacy Decisional ( $B = 0.274$ ,  $\beta = 0.278$ ,  $t = 6.54$ ,  $p < 0.001$ ,  $R^2 = 0.077$ ,  $F = 462.793$ ), Emotional ( $B = 0.490$ ,  $\beta = 0.579$ ,  $t = 16.03$ ,  $p < 0.001$ ,  $R^2 = 0.335$ ,  $F = 257.047$ ), Cognitive ( $B = 0.725$ ,  $\beta = 0.519$ ,  $t = 13.72$ ,  $p < 0.001$ ,  $R^2 = 0.269$ ,  $F = 1808.285$ ), and Covid ( $B = 0.363$ ,  $\beta = 0.408$ ,  $t = 10.10$ ,  $p < 0.001$ ,  $R^2 = 0.166$ ,  $F = 101.920$ ) were significant predictors of Avoidance.

Organizational–relational ( $B = 0.217$ ,  $\beta = 0.313$ ,  $t = 7.46$ ,  $p < 0.001$ ,  $R^2 = 0.098$ ,  $F = 55.623$ ), Physical ( $B = 0.289$ ,  $\beta = 0.431$ ,  $t = 1.79$ ,  $p < 0.001$ ,  $R^2 = 0.185$ ,  $F = 116.352$ ), Inefficacy Decisional ( $B = 0.253$ ,  $\beta = 0.299$ ,  $t = 7.07$ ,  $p < 0.001$ ,  $R^2 = 0.089$ ,  $F = 50.014$ ), Emotional ( $B = 0.354$ ,  $\beta = 0.486$ ,  $t = 12.59$ ,  $p < 0.001$ ,  $R^2 = 0.237$ ,  $F = 158.384$ ), Cognitive ( $B = 0.472$ ,  $\beta = 0.393$ ,  $t = 9.66$ ,  $p < 0.001$ ,  $R^2 = 0.154$ ,  $F = 93.306$ ), and Covid ( $B = 0.399$ ,  $\beta = 0.522$ ,  $t = 13.84$ ,  $p < 0.001$ ,  $R^2 = 0.273$ ,  $F = 191.521$ ) emerged as significant predictors of Intrusion.

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