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Burnout in Italian hospital physicians during the COVID-19 pandemic: a pilot study on the roles of alexithymia and defense mechanisms

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Abstract

Background: COVID-19 pandemic placed unusual additional burden upon international healthcare systems. This study aims to explore the associations between burnout, alexithymia and defense mechanisms in a group of Italian hospital physicians during the COVID-19 pandemic.

Methods: 96 hospital physicians completed self-reported questionnaires through Google Forms platform, including Maslach Burnout Inventory (MBI), Defense Style Questionnaire-40 (DSQ-40), and 20-item Toronto Alexithymia Scale (TAS-20).

Results: Emotional Exhaustion (EE) and Depersonalization (DP) burnout dimensions were positively correlated with alexithymia and with immature and neurotic defenses, while negative associations were correlated with a mature defensive style. MBI Personal Accomplishment (PA) was negatively correlated with alexithymia levels but positively correlated with mature defenses. According to regression models, EE levels were predicted by female gender (beta = −0.20; $p < .04$) and DSQ mature defenses (beta= -.24; $p < .02$); DP levels were predicted by alexithymia total score (beta= 0.26; $p < .04$) and DSQ mature defenses (beta= -.20; $p < .05$); and PA levels were predicted by alexithymia total score (beta = -0.29; $p < .02$) and DSQ mature defense (beta= .45; $p < .001$).

Conclusions: Consistent with the broader literature, an association between burnout and both alexithymia and defense mechanisms emerged. These findings highlight the importance of reducing occupational-related burden on healthcare workers and of promoting protecting strategies to deal with emergency situations.

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1. Introduction

In 2020 the COVID-19 pandemic has been one of the most pressing problems around the world, particularly in Italy, which was the first European country to experience the pandemic and all of its devastating consequences (Renzi et al., 2020a; Sani et al., 2020). Several research worldwide showed that the pandemic, as well as the resulting lockdowns and/or social restrictions, had a substantial impact on both physical and mental health (Mariani et al., 2020).

Numerous studies have focused on healthcare workers as they have been particularly impacted by the pandemic, experiencing increased levels of depression, anxiety, and stress (Chen et al., 2020; Di Tella et al., 2020; Ng et al., 2020; Rodríguez-Rey et al., 2020). All of this appeared to be particularly relevant for doctors and other specialists working in emergency departments, as hospital department, because they were the most exposed to work-related stress during the pandemic (Almeida & DeCavalcante, 2021; Lasalvia et al., 2021). In this direction healthcare personnel were at greater danger of developing psychiatric symptoms and burnout syndrome, that is a psychological condition that develops as a result of long-term work-related fatigue (Maslach et al., 1986). The international literature showed that burnout is widespread among healthcare workers who are routinely subjected to high levels of occupational stress, especially overwhelming emotive and relational contacts (Bria et al., 2012).

Maslach et al. (1986) divided the burnout syndrome into three principal dimensions: emotional exhaustion, depersonalization and reduced personal accomplishment. Emotional exhaustion (EE) is a fundamental characteristic of burnout and refers to feelings of being emotionally overextended and a notable reduction in one's available emotional resources. Depersonalization (DP) is defined as negative, cynical attitude toward the work or the recipients, behaving towards the caretakers without any emotion, as if they are not unique individuals. Moreover, personal accomplishment (PA) refers to feelings of competence and successful achievement related to one's work (Seidler et al., 2014; Taycan et al., 2014). The development of burnout can be defined "…as going through several phases, from increased working efforts to cope with external demands, which can lead to mental and physical exhaustion and demotivational affective states, and on to psychosomatic complaints and finally depressive state" (Nil et al., 2010; p. 72; Seidler et al., 2014). Literature on gender differences in burnout has shown that women are more emotionally exhausted than men (Dahlake et al., 2018; Purvanova & Muros, 2010). As regards the role of the age on burnout expression, several studies have highlighted the presence of an inverse association between age and burnout with younger people reporting higher burnout levels (Di Trani et al., 2021; Gomez-Urquiza et al., 2017; Vargas et al., 2020).

Higher degrees of burnout are linked to detrimental effects on physicians, patients, and healthcare systems, thus researches have long focused on better understanding burnout and creating strategies to reduce it (West et al., 2018). As specifically regards Italy, the majority of burnout research preceding the pandemic, has focused on hospital hematology-oncology physicians (Bressi et al., 2008), cardiac anesthesiologists (Sanfilippo et al., 2018), and hematological unit healthcare professionals (Mannocci et al., 2019), indicating the presence of significant degrees of burnout in these particular environments. During the COVID-19 pandemic several studies investigated the frequency and levels of burnout among healthcare personnel and a recent systematic review exploring the prevalence of burnout amongst healthcare workers in intensive care units (ICUs) and emergency departments during the pandemic, showed burnout levels ranging from 49.3% to 58% (Gualano et al., 2021). In Giusti et al's study (2020), high burnout levels, represented by great emotional exhaustion and low sense of personal accomplishment emerged. Burnout levels, especially as regards emotional exhaustion, were much greater than those found in previous Italian samples prior to the COVID-19 pandemic (Barello et al., 2020). Di Monte et al. (2020) found in a sample of general practitioners high and moderate levels of emotional exhaustion (46.1% and 23.5% respectively), depersonalization (17.6% and 35.3% respectively), and reduced personal accomplishment (29.4% and 42.2% respectively). Marton et al. (2020) found in Italian healthcare workers that psychological symptoms and burnout were associated to a loss of perceived control, fear for patients and families, feeling alone, and anger. According to Di Trani et al. (2021), healthcare personnel with high degrees of burnout showed lower resilience and more difficulty managing uncertainty than those with low levels of burnout.

Several psychological and organizational dimensions can represent a risk or a protective feature for the development of burnout syndrome. More specifically, psychological characteristics may play a key role in determining how individuals react and deal with stressful situations. Among these factors, coping strategies have been thoroughly explored whereas personality traits involved in emotional regulation, such as alexithymia, and defense mechanisms, still deserve investigation (Di Tella et al., 2020; Franco et al., 2020). Alexithymia is conceptualized as an emotion-dysregulation disorder (Taylor & Bagby, 2013) and represents a stable personality trait associated with both psychopathological disorders and somatic diseases (Bratis et al., 2009; Sanchez et al., 2003; Taylor & Bagby, 2013). The construct involved difficulties in identifying and expressing emotions, employing fantasy to regulate painful feelings and finding creative solutions to problems (Taylor & Bagby, 2013). Alexithymia also involved the difficulty in communicating own needs to others for obtaining social support, so representing a vulnerability factor for coping with stress and challenging situations increasing the risk of development

occupational burnout (Di Tella et al., 2020; Gourounti et al., 2016; Renzi et al., 2020b). The studies that previously examined the relationship between alexithymia and professional burnout suggested that alexithymia is significantly associated with burnout even when controlled for confounding factors (Frawley & Smith, 2001; Mattila et al., 2007; Riethof et al., 2020). Bratis et al. (2009) showed that alexithymia was positively associated with emotional exhaustion and depersonalization burnout dimensions and negatively with personal accomplishment. Similar findings emerged in Popa-Velea et al. (2017) and in Taycan et al. (2014). Furthermore, some studies concluded that alexithymia increased the likelihood to develop burnout, with less professional satisfaction (Di Tella et al., 2020; Franco et al., 2020). Therefore, reduced capability in affect regulation, shown by higher alexithymia levels, seemed to represent a vulnerability factor for burnout development.

Defense mechanisms, from a psychodynamic perspective can be defined as automatic psychological mechanisms that mediate the individual's reaction to emotional conflicts and to internal or external stressors (Di Giuseppe & Perry, 2021; Perry, 2014), as several stressful situation arising from the workplace (Pompili et al., 2006). According to a specific hierarchy model, defenses can be organized into three defensive categories going from a lower to a higher adaptiveness that include immature, neurotic and mature defenses respectively (Di Giuseppe & Perry, 2021; Fitzgerald-Yau & Egan, 2018). The immature defensive category represents the largest one and comprised all defenses belonging to action, denial and image distortion. A greater use of immature defenses highlights a scarce awareness of both cognitive and emotional sides of internal/external conflicts. These defensive mechanism act through an inhibition of awareness of unacceptable ideas, feelings, and actions in order to defend oneself from feeling threatened (Di Giuseppe & Perry, 2021; Fitzgerald-Yau & Egan, 2018). The neurotic defensive category is in the midst of the adaptiveness continuum and includes all defenses belonging to neurotic and obsessional defense levels. Individuals that show a high use of these defenses are able to deal with either the emotional or the cognitive side of internal or external stressors, that can be handled one at a time. These defenses allow the individual to keep out of awareness portions of the conflict which would produce painful anxiety (Di Giuseppe & Perry, 2021; Fitzgerald-Yau & Egan, 2018). The mature defensive category represents the highest adaptive defense level helping the individual in dealing with his or her psychologically stressful experiences by integrating affects with ideas, therefore optimizing and possibly resolving the internal or external cause of distress (Di Giuseppe & Perry, 2021; Vaillant, 1977, 1992). These defensive mechanisms can be considered coinciding with what are named positive coping strategies in other theoretical frameworks (Di Giuseppe & Perry, 2021). Studies investigating the associations between defense mechanism and burnout in healthcare personnel showed a

positive association between immature defense and burnout dimensions' emotional exhaustion and depersonalization (Fitzgerald-Yau & Egan, 2018; Pompili et al., 2006; Raggio & Ercolani, 2009). Furthermore, in their systematic review, Bria et al. (2012) demonstrated that healthcare workers showing higher burnout scores were more prone to employ neurotic defenses such as humor, denial, and withdrawal. A recent study conducted during COVID-19 pandemic on 233 healthcare workers reported that mature defenses were associated with higher resilience and personal accomplishment (a burnout dimension), whereas neurotic and immature defenses were related to perceived higher stress and burnout (Di Giuseppe et al., 2021). Moreover, previous research suggests also strong positive associations between immature defense styles and alexithymia (Helmes et al., 2008; Nikmanesh et al., 2021) and negative associations between mature defense styles and alexithymia (Lenzo et al., 2020; Nikmanesh et al., 2021).

In conclusion, burnout is a severe risk for healthcare workers, especially when they are subjected to an additional source of stress such as the COVID-19 pandemic, and alexithymia and defense mechanisms can play an important role in reducing or incrementing the experiences of burnout.

1.1 Aims of the study

This research aims to explore burnout levels in a group of Italian hospital physicians during the COVID-19 pandemic and the association of those burnout dimensions with alexithymia scores, mature/neurotic/immature defense mechanisms, age and gender. A further aim was to investigate any possible predictive effect of alexithymia, defenses, age and gender on burnout dimensions. In particular, it was hypothesized that:

a) To higher levels of emotional exhaustion and depersonalization will correspond both higher levels of alexithymia and greater use of immature defense mechanisms;

b) To higher levels of personal accomplishment will correspond lower levels of alexithymia and greater use of mature and functional defense mechanisms.

c) To the female gender will correspond higher levels of emotional exhaustion.

d) To higher age will correspond lower levels of burnout.

2. Materials and Methods

2.1 Participants

According to the following inclusion criteria healthy Italian individuals have been enrolled for the present study:

- working as physician in a COVID-19 hospital ward during the pandemic;

- between the ages of 25 and 60 years;
- having more than 1 year of working experience
- having the technical capability to use the telematics platform to fill in the tests.

A total of 96 hospital physicians (64 females) take part in the study. The participants reported a mean age of 42.17 (*SD*=10.68) and mean length of work experience of 19.83 years (SD= 37.37). All the participants work in two Italian public hospitals: 72.9% (n=70) work in a hospital in Campania region and the other 27.1% (n=26) work in a hospital in Lazio region. In addition, 40.6% (n=39) reported to be married/cohabiting; 37.5% (n=36) reported to be unmarried/not cohabiting; 21.9% (n=21) reported to be divorced. The two groups of healthcare workers, those from Campania and those from Lazio, were homogenous with regard to burnout levels and sociodemographic characteristics.

2.2 Procedure

The study was carried out in agreement with the code of ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. Our department's university Ethics Committee granted ethical approval. Participants were asked to complete an online survey about emotions and work-related stress, after being enrolled using snowball sampling. Participants submitted their informed consent before completing the self-administered questionnaires, which were made available through an online platform.

2.3 Measures

Socio-Demographic Questionnaire. This questionnaire was realized for collecting data regarding age, gender, education level, marital status, and years of work experience.

The 20-Item Toronto Alexithymia Scale (TAS-20). The TAS-20 (Bagby et al., 1994; Bressi et al., 1996) is a self-report questionnaire for the assessment of the alexithymia construct. Each item is valued on a five-point Likert scale, going from 'strongly disagree' (1) to 'strongly agree' (5). This questionnaire offers both a total score and a score for each factor. It is organized according to three factors: difficulty in identifying feelings (F1), difficulty in describing feelings (F2) and externally oriented thinking (F3). Total scores range from 20 to 100, with higher scores representing higher alexithymia levels. The TAS-20 revealed satisfactory internal reliability (Cronbach's alpha for total score= .75) and test–retest reliability (r =.83) (Bagby et al., 1994; Bressi et al., 1996). A Cronbach's alpha of .79 has been found in the present investigation for the total score.

Maslach Burnout Inventory (MBI). The MBI (Maslach et al., 1986; Sirigatti & Stefanile, 1993) is a self-report questionnaire employed to assess burnout levels. It consists of 22 items, each rated on a six-point Likert scale, ranging from "never" (0) to "daily" (6). It defines burnout as composed by three categories: Emotional Exhaustion (EE) which refers to the exhaustion of one's emotional resources, depersonalization (DP) that involves having an opinion of colleagues and clients as dehumanized objects rather than people, and Personal Accomplishment, (PA) which refers to feelings of capability, productivity, and effective reaching in one's work. For EE and DP dimensions high scores indicate high levels of burnout whereas for PA a high score shows low burnout levels. In this study, Cronbach's alpha was acceptable for all dimensions: EE (.92), DP (.80), PA (.79).

The Defense Style Questionnaire-40 (DSQ-40). The DSQ-40 (Andrews et al., 1993; Farma & Cortinovis, 2000) is a self-report questionnaire aimed to measure groups of defenses mechanisms according to the idea that defenses can be accumulated in clusters on a continuum of maturity–immaturity. It organized defense mechanisms into three classes: mature defenses (8 items), neurotic defenses (8 items), and immature defenses (24 items). As regard the mature defenses category, it consists of items assessing: humor, sublimation, anticipation and suppression. The neurotic defenses category includes: idealization, reaction formation, pseudo-altruism, and undoing. The immature defenses category includes item assessing: projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, rationalization, somatization. Each item is valued on a 9-point Likert scale going from "totally false" to "true." Elevated scores identify higher use of the target defense/style. In the present investigation the Cronbach's alpha was acceptable for all subscales: .80; .71 and .69 respectively.

2.4 Data Analysis

The quantity of participants to include in the study was based on a priori power analysis performed using G*Power 3.1.9.2 (Düsseldorf, Germany). It was valued that to achieve at least 90% power given an expected population rho ϱ (rho) of 0.3 and assuming an α .05, the minimum sample size is 92 subjects (total sample n).

All statistical analyses were executed using the Statistical Package for Social Science version 25 for Windows (SPSS version 25; IBM, Armonk, NY, USA). Frequencies and percentages were used to report discrete variables, and means and standard deviations were used to report continuous variables. The continuous variables included in the following analyses were normally distributed with skewness and kurtosis values in the acceptable range. Pearson's correlation analysis was realized to measure the association between burnout dimensions, alexithymia levels,

defense mechanisms, age, gender. Assumptions for linear regression were tested (linearity, homoscedasticity, normality and independence) and no significant violations emerged. A set of Multiple Linear Regression models were performed using the three dimensions of burnout EE, DP, PA respectively, as dependent variables, and age, gender, alexithymia levels and defense mechanisms scores as independent variables. A p value <.05 was considered significant.

3. Results

Table 1 shows participants' characteristics on the psychological dimensions investigated. Scores regarding the MBI, which were organized according to cut-off criteria, indicated that on Emotional Exhaustion, 52% of the participants showed low levels, 30% medium, and 28% high; on Depersonalization, 52% reported low levels, 28% medium, and 20% high; and on Personal Accomplishment 39.5% showed low levels, 23% medium, and 37.5% high.

Table 1. Participants' characteristics

Psychological Dimensions	**M**	**ds**
TAS-20 Total	45.34	11.89
TAS-20 Difficulty in Identifying Feelings	15.31	6.72
TAS-20 Difficulty in Describing Feelings	11.54	6.21
TAS-20 External Oriented Thinking	18.48	4.90
DSQ Immature Defenses	39.41	26.09
DSQ Neurotic Defenses	18.42	12.70
DSQ Mature Defenses	44.56	15.05
MBI Emotional Exhaustion	21.41	12.01
MBI Depersonalization	6.43	6.53
MBI Personal Accomplishment	36.10	8.02

Note: MBI= Maslach Burnout Inventory; TAS-20= 20-item Toronto Alexithymia Scale; DSQ= Defense Style Questionnaire

Correlational analysis shows several significant associations between burnout dimensions with alexithymia and defense style measures (see Table 2). More specifically, emotional exhaustion and depersonalization burnout dimensions were positively correlated with alexithymia total and factor scores and with immature and neurotic defense styles, whereas negative correlations emerged between these burnout dimensions and mature defense style (see Table 2). For

personal accomplishment burnout dimension, negative associations with alexithymia levels emerged and a positive association between neurotic and mature defense styles was found (see Table 2).

Table 2. Association between burnout dimensions and alexithymia and defense style measures

	TAS-20 Difficulty in Identifying Feelings	**TAS-20 Difficulty in Describing Feelings**	**TAS-20 Externally Oriented Thinking**	**TAS-20 Total**	**DSQ Immature Defenses**	**DSQ Neurotic Defenses**	**DSQ Mature defenses**
MBI Emotional Exhaustion	**.388****	**.255***	-0.059	**.286****	**.296****	-.025	**-.257***
MBI Depersonalization	**.250***	**.365****	**.278****	**.385****	**.328****	**.221***	**-.198**
MBI Personal Accomplishment	-.121	**-.228***	**-.203***	**-.233***	-.009	**.264****	**.507****

****p<.01; *p<.05** *Note: MBI= Maslach Burnout Inventory; TAS-20= 20-item Toronto Alexithymia Scale; DSQ= Defense Style Questionnaire*

An exploration of possible associations between age and gender with burnout dimensions' levels produced only one significant correlation between gender and MBI emotional exhaustion (r=-.220; p=.03), indicating higher levels of emotional exhaustion in women. No associations between age and burnout emerged.

A set of multiple linear regression models were performed using the three dimensions of burnout, emotional exhaustion, depersonalization, and personal accomplishment, respectively as dependent variables, and age, gender, alexithymia levels and defense mechanism scores as independent variables. The first model explains 21% of the variance in emotional exhaustion scores (R2 = 0.21; adjusted R2 = 0.16), thus indicating an adequate fit of the model tested. The independent variables that showed significant effects were female gender (beta = −0.20; p < .04) and DSQ mature defenses (beta= -.24; p< .02). The second model explains 19% of the variance in depersonalization scores (R2 = 0.22; adjusted R2 = 0.17), indicating an adequate fit of the model tested. The independent variables that showed significant effects were alexithymia total score (beta= 0.26; p < .04) and DSQ mature defense (beta= -.20; p< .05). The third model explains 32% of the variance in Personal Accomplishment scores (R2 = 0.36; adjusted R2 = 0.31) thus indicating an adequate fit of the model tested. The independent variables that showed

significant effects were alexithymia total score (beta = -0.29; $p < .02$) and DSQ mature defense (beta= .45; $p< .001$).

4. Discussion

The international literature has shown that healthcare professionals are at particularly high risk for negative psychophysical consequences of the COVID-19 pandemic (Ng et al., 2020; Rodríguez-Rey et al., 2020). Burnout condition appeared to be frequent among healthcare workers who are constantly subjected to overwhelming emotive and relational interactions (Bria et al., 2012; Di Monte et al., 2020). Since several psychological characteristics can play an important role in mitigating the impact of a stressor on an individual, the present study aimed to explore the associations that burnout may have with alexithymia and defense mechanisms among a group of healthcare personnel working in Italian hospitals during the first months of the COVID-19 disease.

As regards burnout levels in the sample investigated, according to burnout cut-off, our results showed that 58% and 48% of the sample reported medium-high levels of emotional exhaustion and depersonalization respectively, whereas 39.5% of the sample reported low levels of personal accomplishment. These results appeared to be in line with those reported by Di Monte et al. (2020) investigating burnout in general practitioners facing the COVID-19 emergency and in Gualano et al's (2021) systematic review showing burnout levels ranging from 49.3% to 58%.

As regards the correlation between burnout dimensions with alexithymia and defenses, the findings of the present investigation seemed to support study's hypothesis regarding the direction of the association. In fact, the results showed that higher scores in emotional exhaustion were associated with higher levels of alexithymia, both for difficulties identifying and describing feeling and also for total scores so confirming previous findings (Bratis et al. 2009; Di Tella et al., 2020; Franco et al., 2020; Popa-Velea et al. 2017; Taycan et al., 2014). Furthermore, a positive correlation with the use of immature defenses and a negative correlation with mature defenses emerged and this appeared to be in line with studies realized both before and during the pandemic (Di Giuseppe et al., 2021; Fitzgerald-Yau & Egan, 2018; Pompili et al. 2006; Raggio & Ercolani, 2009). Similar findings emerged for depersonalization, which was positively correlated with alexithymia total and factor scores, but no significant associations with defense mechanism emerged. The positive association between depersonalization and alexithymia seemed to be in accordance with previous findings showing that this burnout dimension is associated to higher alexithymia levels (Bratis et al. 2009; Di Tella et al., 2020; Franco et al., 2020; Popa-Velea et al. 2017; Taycan et al. 2014). On the contrary, and consistent with study's hypothesis, the personal accomplishment dimension of burnout was negatively

correlated with difficulties in describing feelings, externally oriented thinking, and alexithymia total scores, whereas a positive association with mature and neurotic defense mechanisms emerged. This finding appeared to be in line with previous studies showing an inverse association between this burnout dimension and alexithymia levels (Bratis et al., 2009; Di Tella et al., 2020; Franco et al., 2020) and a positive association with more adaptive defenses (Di Giuseppe et al., 2021). According to these results, it appears possible to affirm that greater difficulties in emotion regulation are associated with greater emotional exhaustion and depersonalization levels, as well as lower personal accomplishment levels. This is consistent with previous literature that supported the association between alexithymia and burnout (Bratis et al., 2009; Franco et al., 2020; Mattila et al., 2007; Popa-Velea et al., 2017), highlighting the possibility that alexithymia may cause an inadequate coping response in dealing with stressful work moments (Frawley & Smith, 2001). Furthermore, our exploration of associations between burnout and defense mechanisms found that mature defenses, such as sublimation and seeking social support for problem solving, resulted to be correlated with lower levels of emotional exhaustion and higher personal accomplishment levels. In contrast, immature defenses including projection, somatization and denial were associated with higher levels of emotional exhaustion and depersonalization. Neurotic defenses, such as the use of humor and devaluation appeared to be associated with higher levels of personal accomplishment. Therefore, in general, it can be concluded that mature defenses—playing a role in attenuating anxiety and stress, and increasing awareness—are associated with lower work-related emotional exhaustion and higher personal accomplishment, thus acting as a protective factor (Cohen, 2003; Fitzgerald & Egan, 2018). On the other hand, immature defenses—promoting lack of awareness and ineffective actions—are associated with higher emotional exhaustion levels, thus representing a risk factor (Fitzgerald-Yau & Egan, 2018). All of this seems to confirm previous literature regarding the association between burnout dimensions and different defense mechanisms (Bria et al. 2012; Bond, 2004; Cohen, 2003; Fitzgerald-Yau & Egan, 2018; Pompili et al., 2006; Raggio & Ercolani, 2009).

As regards the second objective of our study, that was to explore the predictive effect of alexithymia, defense mechanisms, age and gender on the three burnout dimensions respectively, several significances emerged. Mature defenses were the only predictor of all the components of burnout, in the direction of lower emotional exhaustion and depersonalization levels and higher personal accomplishment levels. This result appeared to be consistent with previous studies investigating the role of defense mechanisms on burnout dimension showing that mature defense styles represents the highest adaptive defense level helping the individual in dealing with stressful experiences by integrating affects with ideas, therefore optimizing and

possibly resolving the internal or external cause of distress (Di Giuseppe & Perry, 2021) so representing an important protective element for the prevention of burnout development (Bria et al. 2012; Bond, 2004; Cohen, 2003; Pompili et al., 2006; Raggio & Malacarne, 2007).

Confirming previous findings, gender had a significant predictive effect on emotional exhaustion levels, with female gender emerging as a risk factor since predicted higher levels of this burnout dimension (Blekas et al., 2020; Dahlake et al., 2018; Di Trani et al., 2021; Giusti et al., 2020; Purvanova & Muros, 2010; Raggio & Malacarne, 2007; Zhang et al., 2020). This finding seemed to be supported also by those literature data that identifying women as processing negative/difficult life events in a more emotional way and this may explain the association with the emotional exhaustion dimension (Nolen-Hoeksema, 2012; Popa-Velea et al., 2017). Nevertheless, this element should be better explored since literature highlights that cultural and organizational issues that impact on gender can create the conditions for this difference (Brubaker, 2020; Templeton et al. 2019).

Alexithymia was a significant predictor of both depersonalization and personal accomplishment. More precisely, depersonalization was predicted by higher alexithymia levels whereas personal accomplishment was predicted by lower alexithymia levels. This appeared to be in alignment with previous studies highlighting the role of emotion dysregulation in increasing the risk for burnout and psychophysical health (Bratis et al., 2009; Franco, 2020; Popa-Velea et al., 2017). More specifically, people who find it difficult to regulate emotions, to become aware of them, and to express one's feelings, are reported to be more likely to feel emotionally exhausted, detached and not have feelings of personal achievement. The perception of not having support and the difficulties in asking for help could predispose individual with high alexithymia levels to the impossibility to overpass stressful events, which can promote the condition for burnout (Popa-Velea et al., 2017; Riethof et al., 2020). Furthermore, due to their decreased ability to process and recognize emotions, people with high alexithymia have difficulties in interpersonal relationships, which are experienced as stressful and demanding and seem to showed a propensity to depersonalization that is characterized by seeing neither self nor others as valuable (Riethof et al., 2020).

Age was not a significant predictor of burnout in the present investigation, this appeared to be in contrast with previous findings that highlighted the younger age as a risk factor (Di Trani et al., 2021; Gomez-Urquiza et al., 2017; Vargas et al., 2020). A possible explanation may be due to the complexity of the impact of the COVID-19 pandemic on our participants' work and lives as data collection was realized in the first wave of COVID-19 diffusion.

There are some limits that should be considered for the present findings. Firstly, the limited sample size, in part due to the hard period faced by the healthcare population which may have reduced the time and energy accessible for participating. Secondly, the sample is composed by physician who worked only in two Italian regions, it would be interesting to collect also data about to the other regions in order to explore if the associations between the dimensions explored are dissimilar according to the seriousness of the pandemic emergency. Thirdly the lack of a control group, that should be considered in future investigations in order to allow comparative analysis. Moreover, the cross-sectional nature of our study limits the knowledge on the role of these risk factors in the development of burnout syndrome. To overcome this limit, it may be desirable that longitudinal studies were realized.

A strength of the present investigation regards the variables explored, as the investigation of the association between burnout, alexithymia and defense mechanisms during the pandemic represents a theme poorly explored.

5. Conclusions

In conclusion, consistent with the broader international literature, this research seemed to support an association between burnout, alexithymia and defense mechanisms so highlighting possible areas of clinical interventions. This should lead to the promotion of specific intervention programs aimed to encourage in healthcare professionals the adoption of positive and protective strategies to cope with this difficult health emergency (Di Monte et al., 2020; Giusti et al., 2020). In this light, studies investigating risk and protective factors for burnout development could be relevant to identify specific needs of the medical staff, intervening on them for improving the well-being of individual physicians, patients, and healthcare organizations (Di Monte et al., 2020; West et al., 2018). Moreover, psychological support resources should be made available to improve affect regulation capabilities and adaptive mechanisms to face the pandemic difficult situation in those who are daily dealing with the pandemic. Further studies investigating long term burnout and exploring the effectiveness of specific trainings and psychological intervention programs for burnout reduction are warranted.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any potential conflict of interest.

Author contributions

Conceptualization, M.D.T. and A.C.P.; Data curation, A.R. and M.D.T; Methodology: M.D.T., A.C.P., and A.R.; Formal Analysis, A.R.; Writing – original draft: A.R. and A.C.P.; Supervision, M.D.T.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval was granted by the Ethics Committee of the Department of Dynamic and Clinical Psychology and Health Studies of the University of Roma "Sapienza".

Availability of data and material: data supporting the results showed in the paper will be available from the corresponding author on request.

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