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Distress and Importance of Team Support among Healthcare Workers during the Covid-19 Pandemic in Italy

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Abstract

Aim: To study the impact of COVID-19 on psychological distress of healthcare professionals in Italy and to evaluate the association between team support and distress in the same population.

Methods: An internet survey using validated scales for the detection of depression, anxiety and burnout was administered. Additionally, a visual analogue scale to assess support of the team and managers was used.

Results: 514 participants completed the survey. Healthcare professionals exposed to COVID 19 presented higher levels of stress, anxiety, and depression compared to healthcare workers not exposed. Being infected by COVID 19 during work exerted a similar effect on levels of distress. Levels of distress were significantly higher during the first (March-May 2020) and second wave (October-November 2020) of the pandemic, with no difference between the two waves. During the interval between the two waves, distress was significantly lower. Distress experienced by healthcare workers was inversely correlated by perceived support from team and medical managers.

Conclusions: Presence of higher levels of distress among frontline healthcare workers, as well as the positive impact of team support, suggests the importance of strengthening resilience to prevent potential major consequences (post-traumatic stress disorder, major depression, and anxiety) in this professional category.

Background and Hypothesis

COVID-19 is an infectious disease caused by SARS-CoV-2. The first cases were reported in Wuhan (China), then the infection spread all over the world. The World Health Organization (WHO) on March 11, 2020 declared the novel coronavirus outbreak a global pandemic. The virus has already had a direct impact on the physical health of millions of people, also it is supposed to be a mental health threat of great magnitude [1]; in fact, not only the pandemic, but restrictive measures such as the lockdowns have dramatically affected people's everyday life: in particular, the rapid spread of the virus has reduced the chances of social interaction including transformed them in potentially dangerous situations [2]. Several studies have found an association between the COVID-19 pandemic and psychiatric symptoms, such as distress, anxiety, fear of infection, depression, and insomnia both in the general population and among vulnerable populations including people with pre-existing psychiatric disorders [1]. Gloster et al. [3] assessed 9,565 participants from 78 countries to examine the impact of the pandemic and resultant governmental restrictive measures on mental health. During the peak of stay-at-home orders, the pandemic was experienced as, at least, moderately stressful for almost the entire sample, while 11% reported the highest levels of stress. Symptoms of depression were also present at a high level, and 33% reporting high levels of boredom, and nearly 50% indicating they wasted a lot of time. Consistent with symptoms of stress and depression, 10% of participants were psychologically languishing [3]. These results suggest that there is a subgroup of people particularly prone to COVID 19 mental health consequences, and that nearly 50% of the assessed population reported at least a moderate reduction of mental well-being [3].

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Healthcare workers have been professionally overloaded, trying to manage the psychosocial impact of the pandemic and suffering its effects in person. Previous studies demonstrated an increase of distress and burnout among healthcare workers during epidemics: surprisingly, in many cases they were affected by severe Post-Traumatic Stress (PTS) symptoms, as shown by Wu and colleagues [4]. In the study a sample of 549 hospital employees was assessed during 2003 SARS epidemic and during the 3-year period following the outbreak. Nearly 40% of hospital employees suffered from elevated PTS symptoms three years after the SARS outbreak. They also found that exposure to the SARS outbreak at work, being quarantined, and the death or illness of a relative or friend from SARS, each contributed independently to PTS symptom levels [4].

A recent study [5] evaluated distress and burnout due to the COVID19 pandemic among mental health workers in the Lombardy region in Italy. Main findings showed a mild stress response during the pandemic, with 6.6% of the sample experiencing moderate to severe levels of depression and 11.6% showing moderate to severe anxiety. These results are similar to a recent Chinese study which revealed a high prevalence for mental health symptoms among healthcare workers treating patients with COVID-19 in China. Overall, participants reported mainly symptoms of distress (71.5%) [6].

The aim of the present study was to evaluate disease perceptions, distress and perceived support among healthcare workers in Italy at three different times, which correspond to the main phases of the pandemic management in Italy: T0, the first peak of the infection rate and the stay-at-home order, from March 2020 to June 2020; T1, reduction of the infection rate and the reopening, from June 2020 to October 2020; T2, the second wave of infections with a new progressive closure, from October 2020 to December 2020. We collected data from different healthcare professionals to differentiate between those who were on the frontline and those on the second line, and how the distress was perceived, according to the level of direct and indirect exposure.

We hypothesized that: 1) levels of distress would be higher in operators exposed to COVID-19 (i.e. direct and family contagion) and in frontline operators compared to those on the second line; 2) levels of distress would be inversely correlated to the perceived degree of support obtained by the team and managers; 3) levels would be considerably higher at T0 and T2 compared to T1.

Methods

The open survey was designed to target Italian health professionals through social media (Facebook and Instagram). Questionnaires were distributed electronically over a 2-week period from 18th November to 2nd Dec 2020. The survey was conducted in different regions across Italy. The final convenience sample included 514 healthcare workers, recruited via social media. Before starting the survey, participants had to give their informed consent to continue. Informed consent included the purpose of the study, those responsible for it and information on the confidentiality of the data, anonymity, and personal data protection. Before completing the survey submission, participants were required to respond to all items. Respondents were able to review and change their answers before submitting the questionnaire. The IP address of the participant computer was used to identify potential duplicate entries from the same user. More entries for the same IP address were never allowed. The completion time for all items was approximately 10-15 min. No incentive was offered for participation. Demographic data including sex (male or female), age, geographic location, marital status, number of cohabitants, occupation (e.g. physician, nurse, technician, or other healthcare professionals), work location (e.g. hospitals, outpatient services), medical discipline (e.g. internal medicine, general surgery, intensive care unit, imaging, etc.) were self-reported by responders. The study was conducted according to the principle of the Declaration of Helsinki.

We used four validated questionnaires: the BIPQ (Brief Illness Perception Questionnaire) [7], the PSS-10 (Perceived Stress Scale-10) [8], the BAI (Beck Anxiety Inventory) [9] and the BDI (Beck Depression Inventory) [10]. We also used a survey (13 items) at T0, T1 and T2 to evaluate exposure, perception, quality of life, and burnout. In addition, we asked to evaluate the perception of the support obtained by the team and the manager (2 items) which were rated on a visual analogue scale, ranging from 0 (no support at all) to 10 (best support). BIPQ is a nine-item scale designed to rapidly assess the cognitive and emotional representations of illness. The PSS-10 is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. The ten items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes some direct queries about current levels of experienced stress. The BAI is a 21-item brief measure of anxiety with a focus on somatic symptoms of anxiety that was developed as a measure for discriminating between anxiety and depression. The BDI is a 21-item multiple-choice self-report inventory, one of the most widely used psychometric tests for measuring the severity of depression. Items of each questionnaire were presented in the order required by the protocol and not randomized.

Statistical Analysis

Descriptive statistics were presented for all variables. As all the included variables were not normally distributed, nonparametric tests were applied. A generalized linear model was constructed in order to evaluate the temporal change in PSS-10, BAI and BDI scores. McNemar's test was used to evaluate changes between the three time points in frequency use of psychotropic medications. Bonferroni's correction for multiple comparisons was applied. A two-tailed p-value<0.05 was regarded as statistically significant. All calculations were performed using Stata 16 (Stata Corp, College Station, Texas 77845 USA).

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Results

Results are presented according to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (see supplementary material) [4]. General characteristics of the study sample are depicted in Table 1. Overall, 514 people completed the online survey.

Healthcare professionals exposed to COVID 19 patients (n=318) showed higher PSS scores (21.35 ± 7.46 vs. 18.80 ± 7.14, U=25070.5, p<0.001), BAI scores (13.75 ± 11.46 vs. 9.91 ± 9.43, U=24663, p<0.001) and BDI scores (10.74 ± 10.11 vs. 8.29 ± 8.97, U=26067, p=0.002) at T0 compared to healthcare professionals not exposed (n=196). The same effect was observed at T1 for PSS scores (18.10 ± 6.99 vs. 15.45 ± 6.41, U=24652.5, p<0.001), BAI scores (8.91 ± 9.19 vs. 5.86 ± 7.23, U=25393.5, p<0.001) and BDI scores (8.49 ± 8.82 vs. 5.37 ± 7.28, U=25998.5, p<0.001) in healthcare professionals dealing with COVID 19 patients (n=221). At T2, again the same effect was observed for PSS scores (21.53 ± 7.53 vs. 19.27 ± 7.16, U=23223.5, p=0.001), BAI scores (13.09 ± 10.29 vs. 9.54 ± 8.77, U=22302, p<0.001) and BDI scores (11.76 ± 9.25 vs. 8.59 ± 8.68, U=21696.5, p<0.001) in healthcare professionals dealing with COVID 19 patients (n=352). Having a family member infected by COVID 19 (n=71) determined higher PSS score (22.08 ± 7.44 vs. 20.11 ± 7.41, U=13343, p=0.04), BAI scores (16.85 ± 12.72 vs. 11.56 ± 10.39, U=11773, p=0.001) and BDI scores (12.61 ± 11.04 vs. 9.35 ± 9.47, U=12732, p=0.01) at T0. The same effect was not observed at T1, however in a reduced sample (n=16) as well as at T2 (n=88). Having experienced a family death for COVID 19 did not significantly increase PSS, BAI and BDI scores at T0 (n=16), T1 (n=3) and T2 (n=6). Healthcare professionals who were infected by COVID 19 or developed COVID-like symptoms (n=85) reported higher PSS score (24.35 ± 6.68 vs. 19.59 ± 7.34, U=11320.5, p<0.001), BAI scores (19.84 ± 12.12 vs. 10.79 ± 9.98, U=9832, p<0.001) and BDI scores (15.59 ± 11.38 vs. 8.66 ± 8.98, U=10791.5, p<0.001) at T0. The same effect was observed at T1 (n=21) for PSS (19.71 ± 6.06 vs. 16.46 ± 6.79, U=3684, p=0.02) and BAI scores (11.52 ± 9.99 vs. 6.99 ± 8.14, U=3670.5, p=0.02), but not for BDI score (10.71 ± 10.24 vs. 6.54 ± 7.99, U=3967.5, p=0.07). At T2, healthcare professionals who were infected by COVID 19 or developed COVID-like symptoms (n=67) reported higher PSS score (22.51 ± 6.29 vs. 20.57 ± 7.62, U=12569, p=0.03), BAI scores (15.88 ± 8.90 vs. 11.39 ± 9.99, U=9979.5, p<0.001) and BDI scores (13.24 ± 9.62 vs. 10.39 ± 9.07, U=11832.5, p=0.006).

Correlations between variables are reported in Table 2. Overall, levels of perceived support from the medical directors and the team correlated positively at all-time points (all p<0.05). Additionally, levels of perceived support were negatively related to PSS 10 scores at all-time points (all p<0.05).

A GLM analysis reported a significant difference in PSS 10 scores across the three time points (F=150.89, p<0.001): specifically, scores at T0 were higher than scores at T1 (Mean difference 3.79 CI 95% 3.27-4.31, p<0.001) but not at T2 (Mean difference -0.44 CI 95% -0.97-0.08, p=0.1). Additionally, scored at T1 were significantly lower compared to T2 (Mean difference -4.23 CI 95% -4.76/-3.70, p<0.001).

Table 1: General characteristics of study participants.

	n	%	*Mean*	SD
Age (years)			37.68	10.70
Gender				
Female	373	72.6		
Male	141	27.4		
Marital status				
Single	298	58		
Married/partnered	184	35.8		
Divorced/widowed	32	6.2		
Number of people living in the house			1.65	1.21
Cohabitating with people at risk for COVID 19				
Older subjects	57	11.1		
Children < 10 years	69	13.4		
Healthcare type				
MD	285	55.4		
Nurse	141	27.4		
Psychologist	26	5.1		
Rehabilitation	46	8.9		
Other	16	3.1		
Psychiatrists	74	14.4		

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Table 2: Correlation coefficients between study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Chief support T0	—														
2. Chief support T1	.92**	—													
3. Chief support T2	.85**	.88**	—												
4. Team support T0	.69**	.69**	.59**	—											
5. Team support T1	.65**	.69**	.60**	.90**	—										
6. Team support T2	.60**	.65**	.66**	.83**	.90**	—									
7. PSS-10 T0	−.17*	−.19**	−.17*	−.19**	−.17*	−.20**	—								
8. PSS-10 T1	−.16*	−.19**	−.18*	−.19**	−.22**	−.19**	.64**	—							
9. PSS-10 T2	−.19**	−.23**	−.22**	−.23**	−.25**	−.28**	.66**	.61**	—						
10. BAI T0	−.18*	−.14	−.15*	−.18*	−.12	−.17*	.73**	.45**	.45**	—					
11. BAI T1	−.19**	−.17*	−.17*	−.20**	−.19**	−.18*	.51**	.68**	.48**	.70**	—				
12. BAI T2	−.22**	−.20**	−.20**	−.22**	−.19**	−.25**	.52**	.46**	.70**	.70**	.70**	—			
13. BDI T0	−.23**	−.23**	−.19**	−.19**	−.14	−.15*	.76**	.49**	.48**	.76**	.53**	.51**	—		
14. BDI T1	−.17*	−.19**	−.14*	−.14*	−.12	−.08	.48**	.67**	.46**	.53**	.73**	.50**	.68**	—	
15. BDI T2	−.26**	−.28**	−.25**	−.21**	−.18*	−.19**	.51**	.51**	.73**	.51**	.56**	.74**	.66**	.71**	—

*$p < .05$. **$p < .01$.

A GLM analysis reported a significant difference in BAI scores across the three time points (F=152.44 p<0.001): specifically, scores at T0 were higher than scores at T1 (Mean difference 5.11 CI 95% 4.42-5.81, p<0.001) but not at T2 (Mean difference 0.32 CI 95% -0.40-1.03, p=0.39). Additionally, scored at T1 were significantly lower compared to T2 (Mean difference -4.80 CI 95% -5.43/-4.18, p<0.001).

A GLM analysis reported a significant difference in BDI scores across the three time points (F=117.64 p<0.001): specifically, scores at T0 were higher than scores at T1 (Mean difference 3.09 CI 95% 2.46-3.72, p<0.001) and lower than scores at T2 (Mean difference -0.96 CI 95% -1.66/-0.26, p=0.007). Additionally, scored at T1 were significantly lower compared to T2 (Mean difference -4.05 CI 95% -4.61/-3.50, p<0.001).

Use of anxiolytics was significantly higher in T0 (16.3%) compared to T1 (9.3%) (p<0.001), and in T2 (15%) compared to T1 (9.3%) (p<0.001). No significant difference was observed in use of antidepressants, mood stabilizers or antipsychotics at any time points.

Interpretation of the findings

The present study observed that healthcare professionals exposed to COVID 19 presented higher levels of stress, anxiety, and depression. At the same time, being infected by COVID 19 during work exerted a similar effect on level of distress. This is in line with recent evidence that reported that frontline healthcare workers experienced higher distress during pandemics [12,13]. Healthcare workers may experience post-traumatic symptoms as well as depression and anxiety.

On the other hand, we did not observe a significant impact of COVID 19 related deaths in family members on levels of distress in healthcare professionals: this could be partly explained by the luckily low number of COVID 19 deaths in our sample.

Levels of distress were significantly higher during the first wave of the pandemic (March - May 2020) and the second wave (October - November 2020) as compared with the inter-wave period, with no difference between the two waves. During the interval between the two waves, when life was returning to a new normal, distress was significantly lower. During the two waves in Italy, COVID-19 wards were created ex novo or existing wards (i.e., internal medicine, rehabilitation) were transformed in COVID-19 wards. Several healthcare workers were abruptly moved from their previous occupation to attending highly infectious patients, with brief training, while others continued to attend to their usual chores. This could have caused significant distress, which could have been mitigated in the interval between the two waves, when several COVID-19 wards were closed or returned to their original use [14].

Levels of distress experienced by healthcare professionals at each time point were inversely correlated by perceived support from team and medical managers. This finding could move the focus from a mere description of psychological consequences of COVID-19 on health workers to a more proactive stance: as it is impossible to eliminate pandemic stress, every strategy to increase

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resilience or reduce vulnerability to burnout could be useful [15,16]. Management and organizational support may foster positive feelings about work and a better ability to cope with work stress [17]. Medical managers should overview work schedules in order to distribute work shifts adequately and allow for an adequate number of sleep hours [18]. Moreover, being part of a group and feeling cooperation and trust among team members are generally associated with well-being through shared experiences [19].

The present survey presents both strengths and limitations. The main strength relies in the wide sample of healthcare professionals reached and by the focus on the role of organizational support to potentially counteract the negative impact of pandemics on health workers. Several limitations of the study should be carefully considered to avoid over interpretation of the findings.

Firstly, the survey was conducted during the second wave of the pandemic and was based on the recall of two different (previous) time-points. Presence of recall bias is therefore a major problem; however, our results are still valid even if we focused on the second wave of the COVID 19 pandemic which happened during the survey. Secondly, most of the sample was composed by medical doctors followed by nurses and therefore study findings may not be generalized to every healthcare professional. Finally, we could not quantify levels of COVID 19 exposures, but we relied on the subjects' own perception of exposure.

Possible implications

The present survey shed more light on the topic of work-related distress during the COVID 19 pandemic among healthcare professionals. Presence of higher levels of distress among frontline workers calls for actions to improve resilience and prevent potential major consequences (post-traumatic stress disorder, major depression and anxiety) in this professional category.

Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2000.

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SUPPLEMENTARY FILES

Checklist for Reporting Results of Internet E-Surveys (CHERRIES)

Checklist Item	*Explanation*	*Page Number*
Describe survey design	Describe target population, sample frame. Is the sample a convenience sample? (In "open" surveys this is most likely.)	5
IRB approval	Mention whether the study has been approved by an IRB.	5
Informed consent	Describe the informed consent process. Where were the participants told the length of time of the survey, which data were stored and where and for how long, who the investigator was, and the purpose of the study?	5
Data protection	If any personal information was collected or stored, describe what mechanisms were used to protect unauthorized access.	5
Development and testing	State how the survey was developed, including whether the usability and technical functionality of the electronic questionnaire had been tested before fielding the questionnaire.	5
Open survey versus closed survey	An "open survey" is a survey open for each visitor of a site, while a closed survey is only open to a sample which the investigator knows (password-protected survey).	5
Contact mode	Indicate whether or not the initial contact with the potential participants was made on the Internet. (Investigators may also send out questionnaires by mail and allow for Web-based data entry.)	5
Advertising the survey	How/where was the survey announced or advertised? Some examples are offline media (newspapers), or online (mailing lists – If yes, which ones?) or banner ads (Where were these banner ads posted and what did they look like?). It is important to know the wording of the announcement as it will heavily influence who chooses to participate. Ideally the survey announcement should be published as an appendix.	5
Web/E-mail	State the type of e-survey (e.g., one posted on a Web site, or one sent out through e-mail). If it is an e-mail survey, were the responses entered manually into a database, or was there an automatic method for capturing responses?	5
Context	Describe the Web site (for mailing list/newsgroup) in which the survey was posted. What is the Web site about, who is visiting it, what are visitors normally looking for? Discuss to what degree the content of the Web site could pre-select the sample or influence the results. For example, a survey about vaccination on a anti-immunization Web site will have different results from a Web survey conducted on a government Web site	NA
Mandatory/voluntary	Was it a mandatory survey to be filled in by every visitor who wanted to enter the Web site, or was it a voluntary survey?	5
Incentives	Were any incentives offered (e.g., monetary, prizes, or non-monetary incentives such as an offer to provide the survey results)?	5
Time/Date	In what timeframe were the data collected?	5
Randomization of items or questionnaires	To prevent biases items can be randomized or alternated.	6
Adaptive questioning	Use adaptive questioning (certain items, or only conditionally displayed based on responses to other items) to reduce number and complexity of the questions.	NA
Number of Items	What was the number of questionnaire items per page? The number of items is an important factor for the completion rate.	5-6
Number of screens (pages)	Over how many pages was the questionnaire distributed? The number of items is an important factor for the completion rate.	5-6
Completeness check	It is technically possible to do consistency or completeness checks before the questionnaire is submitted. Was this done, and if "yes", how (usually JavaScript)? An alternative is to check for completeness after the questionnaire has been submitted (and highlight mandatory items). If this has been done, it should be reported. All items should provide a non-response option such as "not applicable" or "rather not say", and selection of one response option should be enforced.	NA
Review step	State whether respondents were able to review and change their answers (eg, through a Back button or a Review step which displays a summary of the responses and asks the respondents if they are correct).	5
Unique site visitor	If you provide view rates or participation rates, you need to define how you determined a unique visitor. There are different techniques available, based on IP addresses or cookies or both.	5

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View rate (Ratio of unique survey visitors/unique site visitors)	Requires counting unique visitors to the first page of the survey, divided by the number of unique site visitors (not page views!). It is not unusual to have view rates of less than 0.1 % if the survey is voluntary.	NA
Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	Count the unique number of people who filled in the first survey page (or agreed to participate, for example by checking a checkbox), divided by visitors who visit the first page of the survey (or the informed consents page, if present). This can also be called “recruitment” rate.	NA
Completion rate (Ratio of users who finished the survey/users who agreed to participate)	The number of people submitting the last questionnaire page, divided by the number of people who agreed to participate (or submitted the first survey page). This is only relevant if there is a separate “informed consent” page or if the survey goes over several pages. This is a measure for attrition. Note that “completion” can involve leaving questionnaire items blank. This is not a measure for how completely questionnaires were filled in. (If you need a measure for this, use the word “completeness rate”.)	5
Cookies used	Indicate whether cookies were used to assign a unique user identifier to each client computer. If so, mention the page on which the cookie was set and read, and how long the cookie was valid. Were duplicate entries avoided by preventing users access to the survey twice; or were duplicate database entries having the same user ID eliminated before analysis? In the latter case, which entries were kept for analysis (eg, the first entry or the most recent)?	NA
IP check	Indicate whether the IP address of the client computer was used to identify potential duplicate entries from the same user. If so, mention the period of time for which no two entries from the same IP address were allowed (eg, 24 hours). Were duplicate entries avoided by preventing users with the same IP address access to the survey twice; or were duplicate database entries having the same IP address within a given period of time eliminated before analysis? If the latter, which entries were kept for analysis (e.g., the first entry or the most recent)?	5
Log file analysis	Indicate whether other techniques to analyze the log file for identification of multiple entries were used. If so, please describe.	5
Registration	In “closed” (non-open) surveys, users need to login first and it is easier to prevent duplicate entries from the same user. Describe how this was done. For example, was the survey never displayed a second time once the user had filled it in, or was the username stored together with the survey results and later eliminated? If the latter, which entries were kept for analysis (e.g., the first entry or the most recent)?	NA
Handling of incomplete questionnaires	Were only completed questionnaires analyzed? Were questionnaires which terminated early (where, for example, users did not go through all questionnaire pages) also analyzed?	5
Questionnaires submitted with an atypical timestamp	Some investigators may measure the time people needed to fill in a questionnaire and exclude questionnaires that were submitted too soon. Specify the timeframe that was used as a cut-off point, and describe how this point was determined.	NA
Statistical correction	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for the non-representative sample; if so, please describe the methods.	NA