The impact of COVID-19 on doctors' well-being: results of a web survey during the lockdown in Italy

S. DE SIO[1], G. BUOMPRISCO[1], G. LA TORRE[2], E. LAPTEVA[1], R. PERRI[1],
E. GRECO[3], N. MUCCI[4], F. CEDRONE[5]

[1]R.U. of Occupational Medicine, "Sapienza" University of Rome, Rome, Italy
[2]Department of Public Health and Infectious Diseases, "Sapienza" University of Rome, Rome, Italy
[3]Research Department Link Campus University, Rome, Italy
[4]Department of Experimental and Clinical Medicine, University of Florence, Florence, Italy
[5]Postgraduate School of Hygiene and Preventive Medicine, University "G. d'Annunzio"
 of Chieti-Pescara, Chieti, Italy

Abstract. – **OBJECTIVE:** On March 12, 2020, the World Health Organization (WHO) declared the outbreak of a new Coronavirus disease (COVID-19), to be a pandemic. From the beginning, Italy (in particular the Northern regions) was the first large European country to be hit and one of the most affected countries worldwide. This had a significant impact on the workload and psychological health of health workers. The aim of this web-based cross-sectional study is to assess the consequences of the COVID-19 pandemic on Italian doctors' well-being and psychological distress, in respect of demographic and occupational characteristics, lifestyle and habits during the lockdown period.

PATIENTS AND METHODS: We conducted a web-based cross-sectional survey based on Google® Forms to collect data. The participation was available during the lockdown period that started in Italy on March 9, 2020 and it was voluntary and anonymous. The questionnaire explored demographic and occupational variables, lifestyle and habits during the lockdown, perceived well-being and psychological distress. Multivariate logistic regression models were fitted.

RESULTS: Our study reported the very alarming psychological conditions of Italian doctors, especially among those who worked in the most affected regions, where a level of psychological distress of 93.8% and poor well-being of 58.9% were registered. These percentages were even higher in the case of female hospital workers with low job seniority, and those caring for COVID-19 patients.

CONCLUSIONS: Our findings reported a significant psychosocial impact of the COVID-19 outbreak on Italian doctors, particularly among those working in the most affected regions of the country. Further studies are necessary to better understand the effects of the COVID-19 pandemic on doctors' well-being and mental health over time, in order to implement effective prevention measures.

Key Words:
　COVID-19 pandemic, Lockdown, Doctor's well-being, Doctor's psychological distress.

Introduction

In January 2020, the World Health Organization (WHO) declared the outbreak of a new coronavirus disease (COVID-19) to be a Public Health Emergency of International Concern. On March 12, 2020, the COVID-19 outbreak was declared pandemic; the same day, Italy counted 15,113 people infected and 1,016 deaths. On March 27, 2020, Italy became the most affected country by the coronavirus spread in the world, counting more than 86.000 confirmed cases.

This huge number of patients who poured into hospitals, put a strain on the limited means of the Italian national health system: on April 1, 2020 there were 28.403 hospitalized of which 4035 in intensive care units[1]. Healthcare workers (HCWs) were among the hardest hit by this event from both a working and psychological point of view.

The Northern regions were the most affected part of the country, with areas such as Lombardia, Piemonte, Veneto and Emilia-Romagna counting, together, 72,110 cases and the remaining 16 Italian regions counting 35,559 cases (April 21, 2020)[2].

From the beginning, the disease represented a hard challenge for healthcare workers: the very poor and contrasting information about it (transmission, symptoms, protection, immunity, hospitalization criteria, recovery etc.) and its appearance during the flu season, resulted in rapidly changing and confusing infection control policies issued by the health authorities. In addition, COVID-19 showed an efficient nosocomial transmission, with a high rate of transmission to HCWs[3]. At the time of writing (May 22, 2020), 163 doctors have died from COVID-19 in Italy.

The previous SARS epidemic of 2003 had significant psychosocial effects on HCWs; these effects appeared to be different in respect to occupational-risk perception and can last for years after the outbreak[4-7]. Chan and Huak[8] reported that the emotional impact on doctors of that sanitary emergency was higher, compared to other healthcare workers.

Therefore, on March 18, 2020, the WHO drew attention to the psychosocial implications of the pandemic, both among the general population and among health professionals[9]. Bao et al[10] underlined how HCWs can experience very stressful challenges that can trigger common mental disorders, including anxiety and depression and can, ultimately, result in hazards that exceed the consequences of the COVID-19 pandemic itself.

Huang and Zhau[11] concluded that, as well as the general population, healthcare workers were at a high risk of developing psychological issues, such as anxiety, depressive symptoms, and poor sleep quality.

Recently, a meta-analysis explored the psychological effects on doctors engaged in managing novel viral outbreaks: being younger, having lower working seniority, being the parents of dependent children, having low support, experiencing a long quarantine or having an infected family member were all identified as risk factors for psychological distress. The availability of adequate personal protective equipment, clear communication by authorities and superiors, adequate rest and psychological support were, on the contrary, associated with reduced morbidity[12].

In addition, the actual pandemic is characterized by lockdown measures (closing of schools, universities, all non-essential businesses and parks, social distancing, limitation of movements and transports, etc.), imposed by many governments, including the Italian one (the "lockdown" was introduced in Italy on March 9, 2020), in order to slow down the spread of the virus. A recent study reported that this can reduce the perception of health and increase that of distress in the general population, even if there is a lack of studies that explore this relationship[13].

Based on the above-mentioned research and motivations, we are encouraged to believe that the COVID-19 pandemic and the consequent lockdown period can deeply affect the health and psychological well-being of doctors. The aim of this web-based cross-sectional study is to assess the consequences of the COVID-19 pandemic on Italian doctors' psychological distress and perceived well-being, respect to demographic and occupational characteristic, lifestyle and habits during the lockdown period.

Materials and Methods

Study Design and Participants

We conducted a web-based cross-sectional survey based on Google® Forms to collect data. The participation was available during the lockdown period which started in Italy on March 9, 2020 and it was voluntary and anonymous. The link of the survey was published on the first author's personal website (https://sites.google.com/a/uniroma1.it/simonedesio) and was sent to 2142 Italian physicians, subscribers to the mailing list of the Research Unit of Occupational Medicine and of the "Umberto I" General hospital of "Sapienza" University of Rome, and of the Department of Experimental and Clinical Medicine of the University of Florence. The authors considered which was the appropriate sample size for an adequate study power, using the EpiInfo™ software, considering a confidence level of 99%, a margin of error of 5% on a total of about 400,000 doctors working in Italy. The analysis computed a representative sample size of 665 doctors.

Data Collection

The participants answered the questionnaire from April 1 to April 21, 2020. A total of 695 participants completed the questionnaires and were ultimately included in the study. The questionnaire consisted of three sections which investigated 1) demographic and occupational variables, 2) lifestyle and habits variables, 3) psychological distress and perceived well-being.

Questionnaire Sections

Demographic and occupational variables

The first section of the survey explored demographic and occupational characteristics. The demographic variables included gender (male or female), age and marital status (single or cohabiting). The occupational variables included: 1) working area, in relation to the Italian regions most affected by COVID-19 (Veneto, Lombardia, Piemonte and Emilia-Romagna) and those which were less affected; 2) professional fields: Primary Care Doctors (PCDs – including family doctors and paediatricians), Hospital Doctors (HDs) and Freelance Doctors (FDs) with different specialties; all with potential positive COVID-19 patients under treatment (C19Ds); 3) job seniority; 4) night shift work; 5) the use of "smart-working" (also intended as "telework" or "remote working"); 6) the availability and use of personal protective equipment; 7) the changes in job demand.

Lifestyle and habits variables

The second section of the survey explored lifestyle and habits variables. Lifestyle variables included living alone or cohabiting (with partner, family or friend/room-mates), feeling sheltered at home, suffering loneliness, feeling comfortable at home. Habits variables included smoking, eating habits, and alcohol consumption.

Psychological distress and perceived well-being

The third section of the survey consisted of two questionnaires: the General Health Questionnaire (GHQ-12) to evaluate psychological distress and the World Health Organization Well-Being Index (WHO-5) to explore subjective well-being.

The GHQ-12 is a self-report indicator of psychiatric disorders currently experienced by the responder in respect of the last two weeks[14]. It consists of 12 questions with 4 possible answers: 1) less than usual, 2) no more than usual, 3) rather more than usual or 4) much more than usual, according to how much they experienced the symptoms indicated. Two scoring methods can be applied: a dichotomous one (0-0-1-1), suggested by the original author, or a Likert-type (0-1-2-3). We have opted for the first approach, in order to have less dispersion in the results, considering a score ≥4 as an indicator of psychological distress.

The WHO-5 Well-Being Index is a questionnaire that measures current mental well-being (time frame: the previous two weeks)[15]. It is composed of 5 items rated on a 6-point Likert scale, which indicate subjective quality of life based on positive mood (good spirits, relaxation), vitality (being active and waking up fresh and rested), and general interest (being interested in things).

Statistical Analysis

Quantitative variables were expressed as median and interquartile range (IQR), qualitative variables were indicated as frequency and percentage.

Univariate analysis, including chi-square for categorical variables and nonparametric tests (*Mann-Whitney*) for skewed quantitative variables, was conducted to assess differences between groups of descriptive variables and the outcome of the questionnaires (dichotomous). Two multivariate logistic regression models were implemented as follows. The presence of psychological distress (GHQ-12 score ≥4) and poor well-being (WHO-5 score ≤13) were considered as dependent variables and each one of the available factors at the baseline evaluation as independent variables (univariate analysis). In the multivariate analysis all the factors with a *p*-value<0.100 at the univariate analyses were included. Multicollinearity among covariates was assessed through the variance inflation factor (VIF), taking a value of 2 for excluding a covariate. However, no variable was excluded according to the previous criterion. Age and gender were included in the multivariate model due to the importance of these two variables. Adjusted odds ratios (adjORs) with their 95% confident intervals (95% CIs) were computed to measure the association among factors at the baseline and the presence of psychological distress or poor well-being. Statistical significance was set at *p*<0.05. The data were analysed using the statistical software Stata® Version 15 (StataCorp LLC, College Station, TX, USA).

Results

A total of 695 participants completed the questionnaires (response rate of 32.45%) and were included in the study. Although the response rate is low, the number reached is higher than the sample size estimated *a priori*. All the results about prevalence and univariate analysis are shown in Table I.

Table I. Characteristics of the sample.

	GHQ-12 score ≥4		GHQ-12 score <4				p-value	WHO-5 score <13		WHO-5 score ≥13		p-value
	No.	%	No.	%	n.	%		No.	%	n.	%	
Total	695	100	619	89.06	76	10.94		344	49.50	351	50.50	
I. Demographic variables												
Gender												
Female	316	45.47	288	91.14	28	8.86	0.110	187	59.18	129	40.82	**<0.001**
Male	379	54.53	331	87.34	48	12.66		157	41.42	222	58.58	
Age Median (IQR)	45	38-60*	45	38-60*	46	36-60*	0.947	44	38-58*	49	38-61*	0.051
Marital Status												
Single	103	14.82	94	91.26	9	8.74	0.439	51	49.51	52	50.49	0.997
Cohabiting	592	85.18	525	88.68	67	11.32		293	49.49	299	50.51	
II. Occupational variables												
Working Area												
Most affected Regions	212	30.51	199	93.87	13	6.13	**0.007**	125	58.96	87	41.04	**0.001**
Less affected Regions	483	69.49	420	86.96	63	13.04		219	45.34	264	54.66	
Professional field												
Primary Care Doctors	154	22.16	138	89.61	16	10.39		77	50.00	77	50.00	
Hospital Doctors	295	42.45	273	92.54	22	7.46	**0.012**	163	59.71	132	48.35	**0.011**
Freelance Doctors	246	35.40	208	84.55	38	15.45		104	42.28	142	57.72	
Doctors Caring COVID-19 patients												
Yes	63	9.07	62	98.41	1	1.59	**0.013**	45	71.43	18	28.57	**<0.001**
No	632	90.93	557	88.13	75	11.87		299	47.31	333	52.69	
Job Seniority median (IQR)	12	5-25	12	5-25	12	5-27	0.725	11	4-20	13	5-30	**0.007**
Night shifts	166	23.88	156	93.98	10	6.02	**0.020**	91	54.82	75	45.18	0.116
"Smart working"	222	31.94	192	86.49	30	13.51	0.136	94	42.34	128	57.66	**0.010**
Job demand												
Higher than before	226	32.52	209	92.48	17	7.52		124	54.87	102	45.13	
Lower than before	334	48.06	293	87.72	41	12.28	0.128	161	48.20	173	51.80	0.098
Unchanged	135	19.42	117	86.67	18	13.33		59	43.70	76	56.30	
Availability and use of personal protective equipment (PPE)												
Yes	644	92.66	576	89.44	68	10.56	0.259	324	50.31	320	49.69	0.127
No	51	7.34	43	84.31	8	15.69		20	39.22	31	60.78	

Table I (Continued). Characteristics of the sample.

	GHQ-12 score ≥4		GHQ-12 score <4				p-value	WHO-5 score <13		WHO-5 score ≥13		p-value
	No.	%	No.	%	n.	%		No.	%	n.	%	
III. Lifestyle and habits variables												
Live Alone	97	13.96	90	92.78	7	7.22		48	49.48	49	50.52	
Cohabits with Partner	198	28.49	181	91.41	17	8.59	0.098	95	47.98	103	52.02	0.934
Cohabits with Family	393	56.55	343	87.28	50	12.72		197	50.13	196	49.87	
Cohabits with Friend\Roommates	7	1.00	5	71.43	2	28.57		4	57.14	3	42.86	
Feeling sheltered at home												
Yes	148	21.30	105	70.95	43	29.05		20	13.51	128	86.49	
No	237	34.10	232	97.89	5	2.11	**<0.001**	186	78.48	51	21.52	**<0.001**
Sometimes	310	44.60	282	90.97	28	9.03		138	44.52	172	55.48	
Suffering loneliness												
Yes	88	12.66	86	97.73	2	2.27		74	84.09	14	15.91	
No	514	73.96	447	86.96	67	13.04	**0.006**	217	42.22	297	57.78	**<0.001**
Sometimes	93	13.38	86	92.47	7	7.53		53	56.99	40	43.01	
Feeling comfortable at home												
Yes	455	65.47	391	85.93	64	14.07		186	40.88	269	59.12	
No	43	6.19	40	93.02	3	6.98	**<0.001**	33	76.74	10	23.26	**<0.001**
Sometimes	197	28.35	188	95.43	9	4.57		125	63.45	72	36.55	
Smoking												
Smokers	133	19.14	119	89.47	14	10.53	0.867	71	53.38	62	46.62	0.336
Number of cigarettes median	8	5-15*	8	5-10*	10	4-15*	0.776	8	4-10*	8	5-15*	0.719
Smoking more	58	43.61	54	93.10	4	6.90	0.133	34	58.62	24	41.38	0.289
Eating												
Change	324	46.62	284	87.67	40	12.35	0.266	181	55.86	143	44.14	**0.002**
Unchange	371	53.38	335	90.30	36	9.70		163	43.94	208	56.06	
Increase of food intake	229	70.68	202	88.21	27	11.79	0.660	130	56.77	99	43.23	0.853
Decrease of food intake	95	29.32	82	86.32	13	13.68		51	53.68	44	46.32	
Increase in alcohol consumption												
Yes	99	14.24	95	95.96	4	4.04	**0.002**	64	64.65	35	35.35	**0.001**
No	596	85.76	524	87.92	72	12.08		280	46.98	316	53.02	
GHQ (Psychological distressed)	619	89.1	-	-	-	-	-	334	54.0	285	46.0	**<0.001**
WHO (poor well-being)	344	49.5	334	97.1	10	2.9	**<0.001**					

IQR=Interquartile range

Demographic and Occupational Variables

Regarding demographic variables, the total sample was made of:
1) 316 (45.47%) females and 379 (54.53%) males, with an median age of 45 years (IQR: 38-60);
2) 103 (14.82%) singles and 592 (85.12%) cohabiting.

Regarding occupational variables, the total sample was made of:
1) 212 (30.51%) working in the Italian regions most affected by COVID-19 and 483 (69.49%) working in the other Italian regions, with an median Job Seniority of 12 years (IQR: 5-25);
2) 166 (23.88%) working on night shifts and 222 (31.94%) in "smart-working";
3) 644 (92.66%) using personal protective equipment;
4) 226 (32.52%) working more than before the pandemic, 334 (48.06%) working less and 135 (19.42%) unchanged;
5) 154 (22.16%) declaring to be PDs, 295 (42.45%) declaring to be HDs, 246 (35.40%) declaring to be FDs; among those 63 (9.07%) C19Ds.

Lifestyle and Habits Variables

Regarding lifestyle, the total sample was made of:
1) 97 (13.96%) doctors living alone, 198 (28.49%) cohabiting with a partner, 393 (56.55%) cohabiting with family and 7 (1%) cohabiting with friends\room-mates;
2) 148 (21.30 %) "feeling sheltered at home", 88 (12.66%) "suffering from loneliness" and 455 (65.47%) "feeling comfortable at home";
3) 133 (19.14%) smokers with an median of 8 (IQR 5-15) cigarettes smoked per day, of them 58 (43.61%) claimed to have increased the number of cigarettes;
4) 324 (46.62%) changed eating habits and 229 (70.68%) increased food intake;
5) 99 (14.24%) reported having increased alcohol consumption.

Perceived Well-Being and Psychological Distress

Univariate analysis

The evaluation by the GHQ-12 demonstrated:
1) the prevalence of psychological distress in female (91.14%), respect males (87.34%), not statistically significant;
2) the prevalence of psychological distress in doctors living in the most affected regions (93.87%), in respect of doctors from the least affected regions (86.96%), statistically significant (p=0.007);

3) the prevalence of psychological distress in HDs (92.54%), in respect of PCDs (89.61%) and FDs (84.55%), statistically significant (p=0.012);
4) the prevalence of psychological distress in C19Ds (98.41%), in respect of other doctors (88.13%), statistically significant (p=0.012);
5) the prevalence of psychological distress in doctors who "work night shifts" (93.98%), in respect of doctors who "work only in day shifts" (87.52%), statistically significant (p=0.020);
6) the prevalence of psychological distress in doctors who "do not feel sheltered in their home" (97.89%), in respect of those who "feel sheltered at home" (70.95%), statistically significant of (p<0.001);
7) the prevalence of psychological distress in doctors who "suffer from loneliness" (97.73 %), in respect of those who "do not suffer from loneliness" (86.96%), statistically significant (p=0.006);
8) the prevalence of psychological distress in doctors who "do not feel comfortable at home" (93.02%), in respect of those who "do feel comfortable at home (85.93%), statistically significant (p<0.001).

The evaluation by the WHO-5 demonstrated:
1) the prevalence of poor well-being in female (59.18%), in respect of male (41,42%), statistically significant (p<0.001);
2) the prevalence of poor well-being in doctors living in the most affected Italian Regions (58.96%), compared to doctors living from the least affected regions (45.34%), statistically significant (p=0.001);
3) the prevalence of poor well-being in HDs (59.71%), in respect of PCDs (50.00%) and FDs (42.28%), statistically significant (p<0.011);
4) the prevalence of poor well-being in C19Ds (71.43%), in respect of other doctors (47.31%), statistically significant (p<0.001);
5) Doctors with poor well-being had a lower job seniority (median 11, IQR 4-20), in respect of other doctors (median 13, IQR 5-30), statistically significant (p=0.007);
6) the prevalence of poor well-being among doctors who are not experiencing "smart-working (52.8%), in respect of those experiencing "smart working" (42.34%,), statistically significant (p=0.010);
7) the prevalence of poor well-being in doctors who "do not feel sheltered at home" (78.48%), in respect of doctors who "feel sheltered

at home" (13.51%), statistically significant (*p*<0.001);

8) the prevalence of poor well-being in doctors who "suffer from loneliness" (84.09%), in respect of doctors who "do not suffer from loneliness" (42.22%), statistically significant (*p*<0.001);

9) the prevalence of poor well-being in doctors who "do not feel comfortable at the home" (76.74%), in respect of doctors who "do feel comfortable at the home" (40.88%), statistically significant (*p*<0.001);

10) the prevalence of poor well-being in doctors who changed their eating habits was higher (55.86%), in respect to those who did not (43.94%), statistically significant (*p*=0.002);

11) the prevalence of poor well-being in doctors with increased alcohol consumption (64.65%), in respect of other doctors (46.98%), statistically significant (*p*=0.001).

Multivariate logistic analysis

The results of the multivariate analysis are shown in Table II.

Regarding the results of GHQ-12, psychological distress was associated with age (OR 1.02; 95%CI 1.00-1.04), with "living in most affected regions" (OR 2.20; 95%CI 1.12-4.31), with "don't feel sheltered at home" (OR 7.80; 95%CI 2.74-22.19), with "feel sheltered at home sometimes" (OR 2.80; 95% CI 1.56-5.02), and with poor well-being (OR 2.72; 95%CI 1.26-5.85).

Regarding the results of WHO-5, male gender is a protective factor against poor well-being (OR 0.51; 95% CI 0.35-0.75); poor well-being was associated with "living in a most affected regions" (OR 1.98; 95% CI 1.31-2.97), "feeling not sheltered at home" (OR 13.43; 95% CI 7.22-24.98), "feeling sheltered at home sometimes" (OR 3.65; 95%CI 2.07-6.43), "feeling comfortable at home" (OR 3.26; 95% CI 1.33-7.95), and with psychological distress (OR 2.96; 95% CI 1.38-6.36); at least "do not suffering from loneliness" is protective against poor well-being (OR 0.28 95% CI 0.13-0.57).

Discussion

This web-based survey has been administered to a sample of Italian doctors, working during the COVID-19 pandemic, to measure psychological distress, perceived well-being, and their own lifestyle habits due to the lockdown.

Two validated, short and worldwide used tools have been chosen to perform the evaluation of the relationship between psychological distress and well-being: the General Health Questionnaire (12 items version) and the WHO-5 Well-being Index.

Our study reports alarming prevalence of psychological distress and poor perceived well-being among doctors.

Psychological distress and well-being in doctors have been the subject of numerous studies. In fact, this category is very exposed to psychosocial risks of a different nature such as work-related stress and violence which are capable of reducing the quality of life[16]. In a previous Irish national survey[17], where the same questionnaires (GHQ-12 and WHO-5) were used and conducted among hospital doctors (but not during a pandemic), there were still high prevalence among doctors of psychological distress (34.8%) and poor well-being (49.5%).

In our study conducted during the COVID-19 pandemic there is an extremely high prevalence of both psychological distress and poor well-being, especially among those who serve in the regions most affected by the virus and a multivariate analysis shows this association. This is consistent with the findings of a recent Spanish study that reported higher levels of stress in HCWs working in very affected areas[18].

In addition, HDs had lower well-being and higher psychological distress in respect of the other doctors investigated. This is probably correlated with doctors' perception of the higher contagiousness of the virus in hospital workplaces and the shortage in Italy of personal protective equipment, especially during the first stages of the outbreak[19,20]. Our study has also shown that female gender is associated with lower levels of perceived well-being compared to male, as already demonstrated by our previous research[21].

Some questions of our survey investigated the possible influence of the COVID-19 pandemic on doctors' lifestyle and habits.

Almost all the participants who reported not to "feel sheltered at home", to "suffer from loneliness", to "feel uncomfortable at home" and to "feel comfortable at home sometimes" had a GHQ-12 score indicative of psychological distress. These findings argued that lockdown consequences amplified the stressful condition and suggest a possible protective potential of family and social relationships. Therefore, a detrimental effect of isolation or loneliness on health has been reported[22,23]. In general, several studies[24,25] have shown that social support, that can come from the work-

Table II. Results of univariate and multivariate logistic analysis.

VARIABLES	GHQ-12 univariate		GHQ-12 multivariate	WHO-5 univariate		WHO-5 multivariate
	OR (95%CI)	*p*-value	aOR (95%CI)	OR (95%CI)	*p*-value	aOR (95%CI)
I. Demographic variables						
Gender						
Male *vs.*Female	0.67 (0.40-1.09)	0.111	0.77 (0.43-1.38)	0.48 (0.36-0.66)	<0.001	**0.51 (0.35-0.75)**
Age	0.99 (0.98-1.01)	0.926	**1.02 (1.00-1.04)**	0.98 (0.97-0.99)	0.029	1.00 (0.99-1.02)
Marital status						
Cohabiting *vs.* Single	0.75 (0.36-1.55)	0.440	-	0.99 (0.65-1.51)	0.997	-
II. Occupational variables						
Working Area						
Most *vs.* Less affected Regions	2.29 (1.23-4.27)	0.009	2.20 (1.12-4.31)	1.73 (1.24-2.40)	0.001	1.98 (1.31-2.97)
Professional field		0.012			0.010	
Primary Care Doctors	Ref.		Ref	Ref		Ref
Hospital Doctors	1.43 (0.73-2.82)	0.291	1.23 (0.58-2.61)	1.23 (0.83-1.82)	0.290	1.06 (0.64-1.77)
Freelance Doctors	0.63 (0.34-1.1)	0.152	0.87 (0.43-1.73)	0.73 (0.48-1.09)	0.131	1.03 (0.61-1.73)
Doctors Caring COVID-19 patients						
Yes vs. No	8.34 (1.14-61.09)	0.037	2.92 (0.34-24.67)	2.78 (1.57-4.91)	<0.001	1.72 (0.83-3.56)
Job Seniority, median (IQR)	0.99 (0.99-1.00)	0.878	-	0.99 (0.99-1.00)	0.884	-
Night shifts	2.22 (1.11-4.43)	0.023	0.61 (0.24-1.47)	1.32 (0.93-1.87)	0.116	-
"Smart working"	0.64 (0.42-1.12)	0.137	-	0.65 (0.47-0.90)	0.010	1.32 (0.85-2.04)
Job demand		0.114			0.097	
Higher than before	1.72 (0.95-3.11)	0.073	-	Ref		
Less than before	Ref.		-	0.83 (0.55-1.24)	0.377	0.92 (0.55-1.53)
Unchanged	0.90 (0.93-3.81)	0.075	-	1.30 (0.93-1.83)	0.122	0.98 (0.63-1.52)
Availability and use of personal protective equipment (PPE)						
Yes vs. No	1.57 (0.71-3.49)	0.283	-	1.30 (0.87-2.81)	0.130	

place, family or society, is an important mediator able to moderate the effect that psychosocial risks have on the perception of stress and well-being.

The present study is a survey conducted on a large sample of doctors in Italy during the epidemic and its results must be interpreted also in light of some limitations: the study is based on a convenient sampling of doctors, on the spontaneous participation of the interviewees and the results' raw materials may lack generalization; moreover, although we have reached a response rate of 32.5%, we must consider that the sample size is slightly higher than the a priori estimate and that the availability of doctors during the pan-

Table II (Continued). Results of univariate and multivariate logistic analysis.

VARIABLES	GHQ-12 univariate		GHQ-12 multivariate	WHO-5 univariate		WHO-5 multivariate
	OR (95%CI)	*p*-value	aOR (95%CI)	OR (95%CI)	*p*-value	aOR (95%CI)
III. Lifestyle and habits variables						
Live Alone	Ref	0.132		Ref.	0.938	
Cohabits with Partner	0.82 (0.33-2.06)	0.686	-	0.94 (0.57-1.53)	0.808	-
Cohabits with Family	0.53 (0.23-1.21)	0.135	-	1.02 (0.65-1.60)	0.910	-
Cohabits with Friend\Roommates	0.19 (0.03-1.18)	0.076	-	1.36 (0.28-6.40)	0.696	-
Feeling sheltered at home		<0.001			<0.001	
Yes	Ref.		Ref	Ref.		Ref
No	19.0 (7.31-49.34)	0.000	7.80 (2.74-22.19)	23.34 (13.27-41.02)	0.000	13.43 (7.22-24.98)
Sometimes	4.1 (2.43-6.97)	0.000	2.80 (1.56-5.02)	5.13 (3.04-8.65)	0.000	3.65 (2.07-6.43)
Suffering loneliness		0.001			<0.001	
Yes	Ref		Ref	Ref.		Ref
No	0.1 (0.03-0.64)	0.010	0.56 (0.12-2.66)	0.13 (0.07-0.25)	0.000	0.28 (0.13-0.57)
Sometimes	0.28 (0.05-1.41)	0.125	0.51 (0.09-2.86)	0.25 (0.12-0.50)	0.000	0.32 (0.14-0.73)
Feeling comfortable at home		<0.001			<0.001	
Yes	Ref		Ref	Ref		Ref
No	2.18 (0.65-7.26)	0.203	1.07 (0.27-4.21)	4.77 (2.29-9.92)	0.000	3.26 (1.33-7.95)
Sometimes	3.41 (1.66-7.01)	0.001	1.94 (0.87-4.33)	2.51 (1.77-3.54)	0.000	1.49 (0.96-2.30)
Smoking						
Smokers vs not smokers	1.05 (0.57-1.94)	0.866	-	0.82 (0.56-1.20)	0.319	-
Number of cigarettes	0.98 (0.89-1.08)	0.760	-	0.99 (0.94-1.05)	0.894	-
Smoking more	2.16 (0.67-6.99)	0.196	-	1.75 (0.90-3.40)	0.096	-
Eating						
Change vs. unchanged	0.76 (0.47-1.22)	0.267	-	1.61 (1.19-2.18)	0.002	0.83 (0.57-1.22)
Increased *vs.* decreased intake	0.30 (0.10-0.85)	0.024	-	0.48 (0.31-0.75)	0.001	-
Increase in alcohol consumption						
Yes *vs.* No	3.26 (1.16-9.14)	0.024	0.37 (0.12-1.13)	2.06 (1.32-3.21)	0.001	0.66 (0.39-1.14)
GHQ-12 score	-	-	-	7.73 (3.90-15.32)	<0.001	2.96 (1.38-6.36)
WHO-5 score	7.73 (3.90-15.32)	<0.001	2.72 (1.26-5.85)	-	-	-

demic emergency was certainly influenced by the demands of work, characterized by many extraordinary shifts, due to the lack of staff.

Conclusions

Our findings reported a significant psychosocial impact of the COVID-19 outbreak on Italian doctors, in particular among those working in the most affected regions of the country. The survey was administered during the peak of the pandemic in Italy, when infection control policies were rapidly changing because of the lack of knowledge of the disease. This unpreparedness, combined with a shortage of PPE, represented a further source of stress for healthcare workers, already dealing with an insidious and demanding disease.

Further follow-up studies are necessary to better understand the effects of the COVID-19 pandemic on doctors' well-being and mental health over time, in order to implement effective prevention measures to be introduced into the workplaces, as recently demonstrated by a systematic review[26]. Taking care of "who takes care" must be, above all nowadays, at the top of the agenda of governments and institutions worldwide.

Ethical Statement

This study was conducted in conformity with the Declaration of Helsinki. An electronic informed consent was obtained from each participant before the start of the investigation.

Conflict of Interests

The authors declare that they have no conflict of interest.

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