

Psychological Impact of a Pandemic Widespread in Healthcare Workers: The Italian and Swiss Perspective Early After of CoVid-19 Outbreak

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Abstract

Background. We investigated the COVID19-related psychological impact in healthcare workers three weeks after its onset in Italy and in Italian-speaking regions of Switzerland. All professional groups of public hospitals in Italy and Switzerland were asked to complete a 38 questions online survey investigating demographic, marital and working status, presence of stress symptoms and need for psychological support.

Results. Within 38 hours a total of 3,038 responses were collected. The subgroup analysis identified specific categories at risk according to age, type of work and region of origin. Critical care workers, in particular females, reported an increased number of working hours, decline in confidence in the future, presence of stress symptoms and need for psychological support. People reporting stress symptoms and those with children declared a higher need for psychological support.

Conclusions. The large number of participants in such a short time advocates for a high interest on topic among hospital workers. The COVID19 outbreak could have been and still be a repeated trauma for many health professionals, with risk of future psychiatric sequelae. It is of outstanding importance to implement short and long-term measures to mitigate impact of the emotional burden of this pandemic while at the same time dealing with its clinical challenges.

Background

The world has been (and is still) experiencing a mass casualty event [1], being stressful and intrusive by affecting daily life and putting adaptive skills to the test. Psychologically, during the early stages of the outbreak we have experienced the so-called alarm stage [2] because of a virus that confined all of us at home (or at work, in the case of health personnels), putting social relationships, freedom and economy at strain. Feelings of inadequacy or insufficiency are common and one can experience a sense of being lost and confused [2]. Moreover, we are still subjected to constantly heavy load of information coming from the mass media and which is not at all times consistent or comprehensive [3].

After the initial stun, anxiety, irritability and restlessness come forth. There are some reactions that can be considered normal: physical reactions like palpitations or difficulty breathing (expression of a sympathetic system activation, not of Coronavirus); cognitive reactions like disorientation, difficulty giving a meaning to the pieces of information received and understanding the real severity of the event; emotional reactions like anguish, stunning, shock, anger, sadness [4–7] and fear of people one can comes across while grocery shopping, walking into a pharmacy or into a hospital (we could even feel stuck or deprived of the desire to carry out daily activities); behavioral reactions (difficulty communicating, hyperactivity, ease to either verbal or physical confrontation, lack of functionality in the work place). One could also experience the inability either to unwind and relax, or to fall asleep or to sleep.

It is likely that everyone would have experienced marked stress reactions and that some will develop post-traumatic stress disorder (PTSD) [8]. The response to a traumatic event is subjective and dependent on numerous factors such as social relationships that can offer emotional support (friends, family, colleagues) and the kind of working activity [8]. Facing this largescale infectious public health crisis, medical staff are under both physical and psychological pressure or, at least, it can be hypothesized [2, 9]. In this scenario, the mental status of healthcare professionals is dangerously jeopardized, because of both the key and front-line role they play and the risk of becoming infected [5, 8].

The aim of this study was to investigate the psychological impact of CoVid-19 outbreak in hospital workers in the first three weeks of outbreak in Italian speaking regions, such as northern Italy, where the European outbreak began, and southern Switzerland, that followed few days later.

Results

From 14th March 2020, 8.52 p.m. to 16th March 2020, 10.45 a.m., over a 38 hours period, 3,038 hospital workers completed the survey. The percentage of completed surveys was 97.3% as 79 subjects did not answer one or more questions.

Demographics, social and working characteristics

The majority of our respondents were physicians, female and people aged 26–36. Details on age, gender, regions of origin and working characteristics are reported in Table 1 and Fig. 1.

Table 1
Demographic, social and work characteristics.

		N	%
Country	Italy	2176	71.6
	Switzerland	804	26.4
	Not specified	58	2.0
Sex	Female	2229	73.7
	Male	795	26.3
	Not specified	14	0.4
Age (year-old)	18–25	114	3.8
	26–35	1035	34.1
	36–45	996	32.8
	46–55	617	20.3
	56–65	253	8.3
	over 65	23	0.8
	Not specified	0	0
Kind of job in hospital	Physicians	1600	53.3
	Nurses	550	18.3
	Radiology, intermediate care technicians	441	14.7
	Ambulance services	87	2.9
	Obstetricians	60	2.0
	Administrative	49	1.6
	Technical services	30	1.0
	Hospitality services	13	0.4
	Pharmacy	7	0.2
	Other hospital services	167	5.6
Civil status	Married	1313	43.3
	Single	837	27.6

Characteristics are expressed as absolute value and percentage.

		N	%
	Stable relationship	672	22.2
	Divorced	172	5.7
	Widowed	25	0.8
	Civil Partnership	13	0.4
	Not specified	6	0.1
Family (number of people)	1	615	20.3
	2	769	25.4
	3	700	23.1
	4	663	21.9
	5	184	6.1
	> 5	97	3.2
Children < 18-year-old in household	0	1734	57.3
	1 or more	1304	42.7
Elderly > 65-year-old in household	0	2422	80.0
	1 or more	616	20.0
Years of work in hospital	0–1 years	207	6.8
	2–5 years	623	20.5
	5–10 years	634	20.9
	10–20 years	858	28.3
	20–30 years	478	15.8
	> 30 years	233	7.6
	Not specified	7	0.2
Physical activity	Once a day	180	5.9
	4–5 times a week	185	6.1
	2–3 times a week	855	20.3
	Once a week	439	14.5
Characteristics are expressed as absolute value and percentage.			

		N	%
	Less than once a week	295	9.7
	None at all	1081	35.6
Increased number of working hours	No	2110	70.0
	Up to 10 hours	673	22.3
	Up to 20 hours	161	5.3
	Up to 30 hours	40	1.3
	> 30 hours	30	1.0
Characteristics are expressed as absolute value and percentage.			

Seventy percent of people declared not to have any additional work due to the CoVid-19 emergency. Among people who responded to have to work more, 59% was ambulance personnel, 38% nurses, 36% administrative personnel and 30% physicians. Dividing for department, 60% of workers in intensive care unit, 50% of anesthesiologists, 50% of the staff in emergency department and 46% of general practitioners declared to work more than normal. People working in hospital in the last 20–30 years had the higher percentage of increased number of working hours. By grouping working categories in critical care (intensive care unit, emergency department, anesthesiology, ambulance service), surgery (otorhinolaryngology, neurosurgery, orthopedics, cardiac surgery, urology, gynecology) and general practitioners, surgery resulted to be the group that had to reduce the most the number of working hours (C.I. 25.0-31.7%), whereas the other two groups had to work more (C.I. 44.7–52.3% for critical care and 40.8–54.8% for general practitioners). On the contrary, 2256 (76.4%) people did not have to reduce their working-hours because of CoVid-19 emergency, while 308 (10.4%) had to reduce the work up to ten hours per week, 92 (3.1%) up to 20 hours per week, 121 (4.1%) up to 30 hours per week. One-hundred and fifty (5.1%) people had to be quarantined and 24 (0.8%) reported to get infected with the virus. Twenty-three percent of physicians actually declared to have to work less than normal. As expected, people working in southern Italy (C.I. 16.6–22.8%), where the CoVid-19 did not spread yet, declared to work less than their counterpart in northern Italy (C.I. 31.1–35.6%) and Switzerland (C.I. 33.5–48.4%).

Stress symptoms

Details are reported in Table 2. The decision tree analysis showed a higher probability of sleeping less than normal (accuracy 62.2%) in people aged > 30 from Italy and having one or more children in their family. In particular, nurses of the critical care with history of anxiety problems were the category at higher risk to suffer from sleep disturbances (accuracy 82.9%).

Table 2
Stress symptoms.

		N	%
Sleeping	Sleep less than usual	1203	39.6
	Sleep the same number of hours but they feel less rested	953	31.4
	No change	678	22.3
	Sleep more than usual	172	5.7
	Sleep the same number of hours but they feel more rested	30	1.0
Eating	No change	1164	38.4
	More than usual	715	23.6
	Less than usual	529	17.4
	Same quantity of food, but healthier	223	7.3
	Same quantity but more unhealthy food	402	13.3
Smoking	Never smoked	1820	59.9
	Started before the last three weeks	652	21.5
	Quitted before the last three weeks	487	16.1
	Started in the last three weeks	27	0.9
	Quitted smoking in the last three weeks	41	1.4
Characteristics are expressed as absolute value and percentage.			

Eating habits changed in 1869 (61.5%) hospital workers and 679 (22.3%) declared to be active smokers. Among them, 268 subjects (39.5%) had to increase the number of cigarettes (cigars, e-cigarettes, etc.) smoked per day in the last three weeks. One-thousand-six-hundred-fifty-seven people (55.1%) stated to drink alcohol occasionally or regularly. Among them, 57 (3.4%) started in the last three weeks and 255 (15.3%) declared that their consumption had increased in the last three weeks. The vast majority of respondents said that they never used drugs (2756, 91.1%), whereas 129 quitted before the last three weeks (4.2%) and three (0.1%) within the last three weeks.

Almost a half of our sample (1538 people, 50.6%) declared to have a chronic health problem, of whom roughly a quarter (348 subjects, 22.6%) experienced a worsening in their chronic health condition. Appearing of new symptoms were reported by 969 individuals (31.9%) and, more specifically, 285 (9.4%) experienced palpitations, 276 (9.1%) respiratory symptoms, 124 (4.1%) pain and 285 (9.4%) other symptoms.

Regarding “How much free-time do you spend looking at information about CoVid-19?”, 654 people (21.1%) declared less than an hour per day, 1112 (36.7%) between one and two hours, 1094 (36.1%) more than two hours per day and 173 (5.7%) did not look at such information. Nearly half of our sample (1369 subjects, 45.1%) reported to talk about the CoVid-19 outbreak with family, friends and colleagues for more than two hour per day, 1116 (36.8%) between one and two hours, 505 (16.7%) for less than an hour and 44 (1.4%) did not spend time speaking about CoVid-19.

Among people with children, 451 (26.0%) reported excessive crying or unusual irritation, 308 (17.7%) noticed a behavioral regression, 186 (10.7%) noticed unusual headaches or other unexplained pain sensations, 752 (43.3%) reported anxiety and concern about the CoVid-19 outbreak.

Physical activity was reduced in 1428 (47.0%) subjects in the last three weeks, while 125 (6.3%) said they could increase it. The physical contacts diminished in 2875 people (94.9%), increased in 12 people (0.4%) and did not change in 143 subjects (4.7%). As opposed to physical contacts, virtual contacts increased for 1960 individuals (64.6%), diminished for 175 subjects (5.8%) and did not change for 898 people (29.6%). Hobbies and other activities undertaken for pleasure or relaxation diminished for 1908 persons (63%), increased for 260 persons (8.6%) and did not change for 862 people (28.4%). A statistically significant correlation was found between increased number of working hours and stress symptoms such as eating less or more, sleeping less or not feeling relaxed, drinking or smoking more.

One thousand two-hundred and eighty-four people (42.4%) declared they are separated from their family because of CoVid-19.

Need for psychological support and confidence in the future

In the last three weeks 706 people perceived to need a specialized psychological support (23.3%). Confidence in the future was diminished for 1404 persons (46.3%), increased for 246 subjects (8.1%) and did not change for 1384 people (45.6%). People feeling the need of professional psychological support were more often female (C.I. 24.8–28.3% vs. 13.0-17.1% for females and males respectively), in a couple (C.I. 23.7–27.4%) or subjects reporting stress symptoms (Fig. 2). Long-career workers (C.I. 7.1–15.0%) and ambulance services (C.I. 7.5–20.8%) expressed less often the need for psychological support. As reported in Fig. 3, different professional categories expressed different psychological support need. People stating an increased confidence in the future were more often males (C.I 5.4–11.6% vs. 9.2–30.2% for females). As expected, among people with diminished confidence in the future there was a higher prevalence of females (C.I 34.2–60.6% vs. 32.6%-45.7% for males).

Plotting the data by country, the confidence in the future in the last three weeks was more lowered in people from Italy as compared to Switzerland (C.I. 46.0- 52.3% vs. 34.2–41.1%). This difference did not change by plotting data either by work category or by age or length of career. Surprisingly, by plotting the decreased confidence in the future for the type of hospital work, all categories were equally affected except of ambulance services (C.I. 16.1–33.6% vs. 40.0-51.2% for other categories).

Finally, history of anxiety resulted to be an independent factor associated to a reduced confidence in the future (C.I. 47.7–60.2% vs. 37.6–42.5% with and without history of anxiety respectively).

Discussion

The present study highlights elevated stress levels in a cohort of Italian-speaking hospital workers during the early phases of the outbreak of Sars-Cov2 infection due to the novel CoVid-19. To best of our knowledge, our study was the earliest to explore the psychological impact of this novel pandemic on healthcare workers among Italian speaking countries (Italy and Italian-speaking regions of Switzerland).

Hospital workers have engaged with catastrophic events caused by the massive CoVid-19 outbreak [11]. Beyond demanding clinical and logistic issues, hospital employees have to deal with their own physical and mental health [11–15]. Work-related stress has shown to impact physician's mental health, patients' care quality and the efficiency of the healthcare system [16]. Consequences in terms of mental health in the context of maxi-emergency situations may be even more pronounced than normal. Feelings of inadequacy, insufficiency, lostness or confusion are common and hospital workers may even experience negative behavioral reactions, depression and illness, possibly leading to lack of effectiveness and efficiency at work [4–6].

The large number of responses and the small percentage of uncompleted surveys (2,7%) in less than 40 hours advocates for a high interest in the subject among healthcare personnel. This may also express the need among healthcare workers to communicate, to be heard and understood that encompasses professional attitude and rules of conduct and touches the psyche and emotions.

More than 50% of survey participants were physicians, probably because the survey promoters were physicians both in southern Switzerland and northern Italy and invitations to participate were sent through personal contacts and social media. However, the high turnout rate of several other hospital categories could mirror the concept that the present is a common burden among all health workers.

Demographics, social and working distribution

The population aged 26–45 represents the majority of the sample, probably because it is more likely to be reached by social media. The small number of people aged between 18–25 is likely to reflect the relatively low number of very young people working in hospitals as confirmed by the fact that medical trainees under 26-years of age are not yet medical doctors in Italy and Switzerland. The distribution of worked years in hospital roughly reflects the age distribution.

In our sample, two thirds of survey participants were female. This could be interpreted according to the fact that a growing percentage of medical professionals is represented, nowadays, by women. It could be also speculated that gender differences may play a role in stress perception and management. Hormonal differences in hypothalamic-pituitary-adrenal axis and autonomic nervous system response are well-known. It has been hypothesized that females tend to experience more frequently anxious and depressive

states (also with physical symptoms), being more aware of potential stressors rather than men [17] In our sample, percentages of married, single, divorced etc. and other demographic characteristics were grossly comparable to the Swiss and Italian population [18, 19].

Nearly one third of hospital workers in our study had to increase their working activity. It represents the first, well-recognized stress factor, proportional to the increase of worked hours [20]. As expected, health care professionals having to increase their working hours, are those employed either in critical care settings or general practitioners, the first categories having to be confronted with the CoVid-19 emergency. On the other hand, in several hospitals in northern Italy and southern Switzerland a dramatic reduction of surgical elective cases and outpatient clinic activity has been deemed necessary to contain virus spread and, as a consequence, surgeons as a category experienced a reduction in working hours. Notwithstanding, a reduction of working hours should not be considered less insidious, as it could nonetheless jeopardize the mental status and could lead to depressive symptoms, hopelessness and uselessness [21].

Stress symptoms

Sleep disturbances can be caused by stress and be related to post-traumatic stress disorder and the first response is generally considered a period of arousal and wakefulness [22, 23]. A great proportion of hospital workers in our study declared to sleep less than normal and to feel less restored by sleep in general, presumably as a reaction to the stressful circumstances and it is likely to reflect the high prevalence of sleep arousal and anxiety symptoms in healthcare professionals.

The correlation analysis showed a relatively higher prevalence of stress symptoms among young professionals with at least one child to care of, as response of having to face the CoVid-19 outburst emergency.

Similarly, an increase or a decrease in in food intake may mirror a reaction to a stressful situation and, actually, in our sample, only 40% of the interviewed reported no change [24]. Moreover, among smokers, there was a high proportion of participants that declared to have increased the number of cigarettes per day in the first three weeks since the outbreak onset. A smaller, but significant proportion of people reported an increase in alcohol consumption. All these behavioral changes can be considered stress symptoms [25, 26]. In our study, a strong correlation was found between the above-mentioned symptoms and the need for psychological support. In fact, people reporting such symptoms were more prone to report the need for psychological support. As far as we know, this is the first time that such a need is quantified within the emergency of CoVid-19.

Need for psychological support

Interestingly, people with children reported the most stressful answers and felt the need for professional psychological support more often than their not-parenting peers. Despite some might consider this obvious, such data are nonetheless of outstanding importance, as hospital employees are often in the fertile age range. In the setting of a massive viral outbreak, hospital caregivers experience important

issues in caring for their children because of the closure of schools and of other facilities. Parents probably do not experience only the stress related to future uncertainty but also the fear of getting infected and possibly transmit such an infectious disease to their offspring. Specifically, CoVid-19 has shown to be particularly infective also for hospital workers and casualties have been reported among hospital staff [12]. Coherently, many hospital workers with children (nearly 95%) declared to have reduced their physical contacts with other family components.

Almost all subcategories of hospital workers perceive the stress related to the outbreak equally. Only long-career workers and ambulance service personnel reported to need psychological support less as compared to other categories. This may be explained by the high level of experience and long-standing training in stress management in long-career employees. On the other hand, emergency services personnel may be used to address stressful situations, as they are part of a coordinated and ordered emergency response and have to constantly handle very high levels of stress [27, 28].

The actual outbreak could be a repeated trauma for many healthcare categories, putting them at risk of psychiatric sequelae such as PTSD [8, 29]. The present outbreak could be a repeated trauma for many health professionals and could put them at risk of developing psychiatric sequelae such as post-traumatic stress disorder. It is of outstanding importance in such a critical situation to promptly implement measures to mitigate the impact of the emotional burden of the present COVID-19 pandemic while at the same time dealing with its clinical challenges [2, 4].

In particular, positive behaviors such as healthy eating, sport practicing and sleeping an adequate number of hours have shown to impact and reduce the impact of stress [30]. Many other strategies have also shown to be effective, such as the implementation of debriefing sessions and group therapies to share experiences and relieve the sorrow related to challenging and stressful situations. Programs of de-escalation of tension through mindfulness techniques could be also cost-effective and easily implemented in routine practice to prevent future development of acute and chronic PTSD, major depression or suicidal behaviors [31, 32].

Our study has some limitations. Firstly, our data were collected in a completely anonymized and we have not certainty on their truthfulness. Nonetheless, our data denote a certain internal coherence, that can be interpreted as trustworthiness. Secondly, it can be considered an initial evaluation and further studies in different time points of the outbreak are needed to understand the impact of CoVid-19 emergency on healthcare workers' psychology and mental health. Thirdly, our sample is mainly (but not exclusively) composed of physicians and that could lead to a selection bias among the different hospital working categories and may not entirely reflect the actual global status.

Conclusions

Perceived psychological burden in hospital workers has to be considered relevant since the early phases of an infectious disease widespread. CoVid-19 outbreak has, therefore, to be considered as a major stress event, able to threaten the physiological and psychological integrity of individuals, in particular healthcare

professionals. Counseling, psychological support and awareness on this subtle threat to hospital workers should not be overshadowed, as even hospital efficiency may be jeopardized.

Methods

Aim of the present study was to explore the psychological effect of CoVid-19 outbreak among healthcare workers in Italian speaking regions three weeks after the outbreak.

Study design and participants

Between 14th and 16th March 2020, hospital workers of different public hospital in Switzerland and Italy were asked to participate a survey regarding the psychological impact of CoVid-19 outbreak on the daily life, at the time point when the virus mainly widespread in northern Italy, Iran and China, but hadn't assumed an extensive dissemination in Switzerland yet. Participants were personally invited by the Authors to answer the questionnaire via social media (either Facebook or WhatsApp) and agreed voluntarily to the questionnaire being fulfilled. All data were anonymized, so that, according to the actual Swiss legislation, no informed consent or institutional review board approval were needed. All staffed hospital teams were included, such as nurses, physicians, obstetricians, pharmacists, technical service, hospital canteen, laundry and others.

Questionnaire

The questionnaire (see *Suppl. material* available on line) was built on Google Forms (<https://www.google.com/forms/about/>) and consisted in 38 questions investigating demographic, social and working status (gender, age, civil status, total number of people and people > 65-year-old in the family, worked years in hospital, profession, department, working time changes since the beginning of the outbreak, chronic diseases worsening, alcohol drinking, drugs consumption, social media use, hobbies, history of anxiety and medical therapy), stress symptoms (alimentary behavior changes, new symptoms occurring in the last three weeks, smoking status and number of cigarettes/day, number of hours spent to get information and to speak about the CoVid-19 widespread, detachment from family due to the quarantine, stress behaviors in children, changes in physical activities, change in physical contacts) and need for psychological support (actual perception of the need of qualified psychological support and overall trust in the future). We decided to not use validated questionnaires because they did not guarantee flexibility and rapidity of use; furthermore explorative surveys are a method already adopted for other researches about pandemics [8]. All data were collected on an Excel database (Microsoft Excel® 2019) and analyzed.

Statistical methods

Statistical analysis was performed using the open source packages "Pandas," "NumPy," "SciPy," "Seaborn," and "PyMC" for Mac Os X versions 0.23.0, 11.1.3, 1.1.0, 0.8.1, and 2.3.6, respectively. Our analysis was based on highly credible intervals (C.I.) of parameter estimates (*); statistical significance was considered achieved whenever credible intervals would be non-overlapping. In order to compare

proportions in different sub-populations, we performed a Bayesian estimate of the parameter distribution for a Bernoulli stochastic variable using a non-informative uniform prior. The posterior was then plotted in order to have a graphical overview, and credible intervals were computed by assessing the highest density interval (HDI) at 95%. Only as a reference, whenever two proportions had to be compared, we used also a two-tail P test computation based on classic proportion comparison using chi-square. Statistical significance was considered $p < 0.05$. All MCMC runs were checked for adequacy on the basis of Raftery-Lewis diagnostics and by visually inspecting Z score plots. MCMC runs were for 40,000 iterations with a 5,000-iteration burn-in [10].

Declarations

Declarations

Ethics approval and consent to participate

The study was conducted in full agreement with the national and international regulations, and the Declaration of Helsinki (2000). Participants' personal information, including names, were kept anonym to maintain and protect privacy and confidentiality of data. All participants were fully informed about the study requirements and were required to accept the data sharing and privacy policy before participating in the study. The anonymous nature of our survey did not allow tracing in any way sensitive personal data. Therefore, the present study did not require approval by Ethics Committee.

Consent for publication

Not applicable.

Data availability

Raw data supporting the conclusions of this manuscript will be made available by the authors, without undue reservation, to any qualified researcher.

Competing interest

The authors have no conflict of interest to declare.

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Author contributions

LU, SaU and LJP designed the study. LU was involved in constructing the dataset, interpreting data and drafting the manuscript. PMH, FM, StU, CZ and LJP helped in data collection and revising the final questionnaire. All authors discussed the results and commented on the manuscript.

Authors' information

LU is an Emergency Medicine specialist (MD, PhD) who received a 4-year-special-training in Cognitive Behavioral Therapy at the Cognitive Behavioral Therapy School of Milan (<https://studicognitivi.it>). SU (MD) is a psychiatrist and neurologist trained in developmental medicine. All the authors have scientifically and clinically shared working experience, have published past researches on impacted journals and are committed to ameliorate healthcare workers job conditions.

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Figures

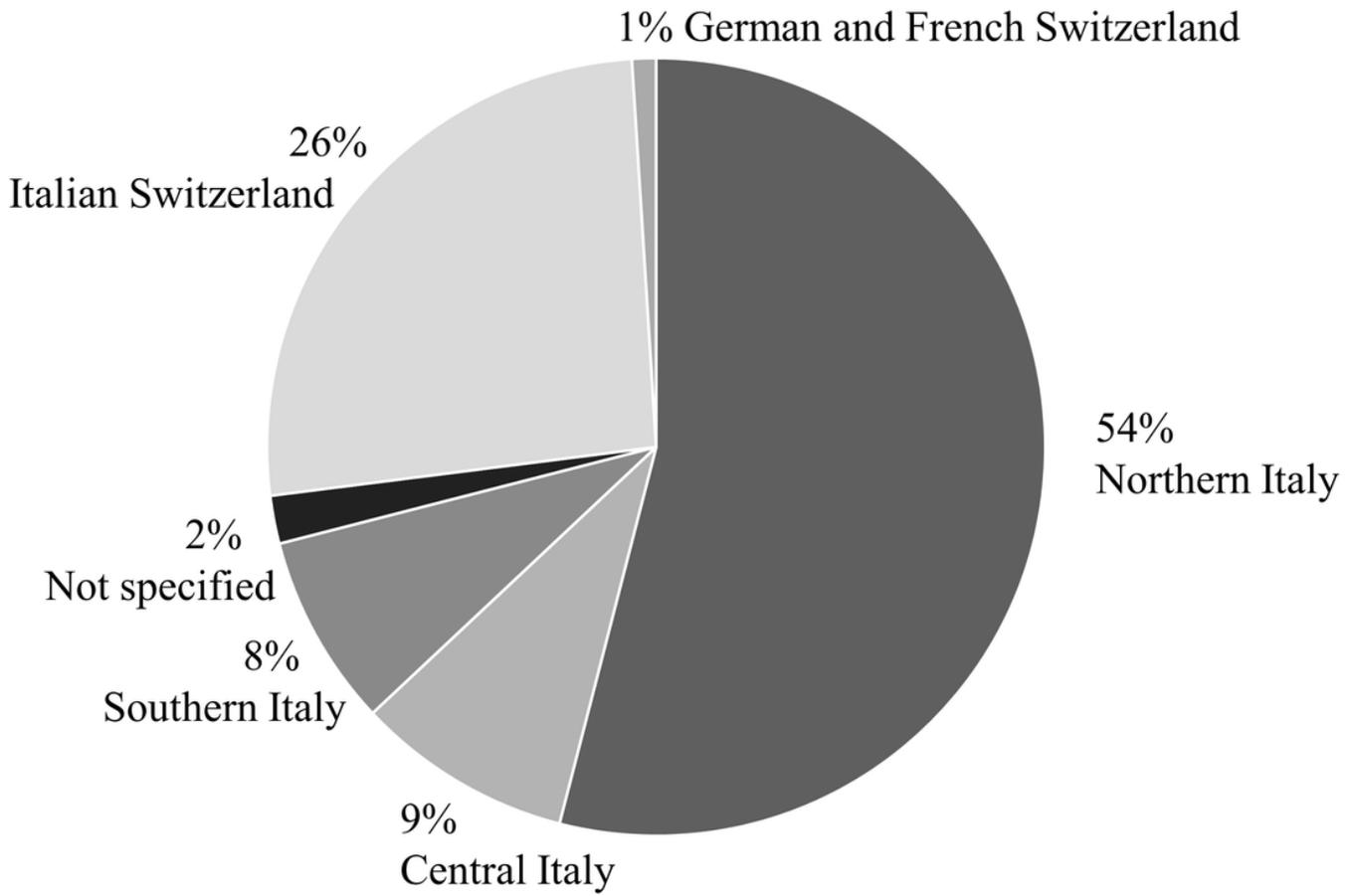


Figure 1

Participants' regions

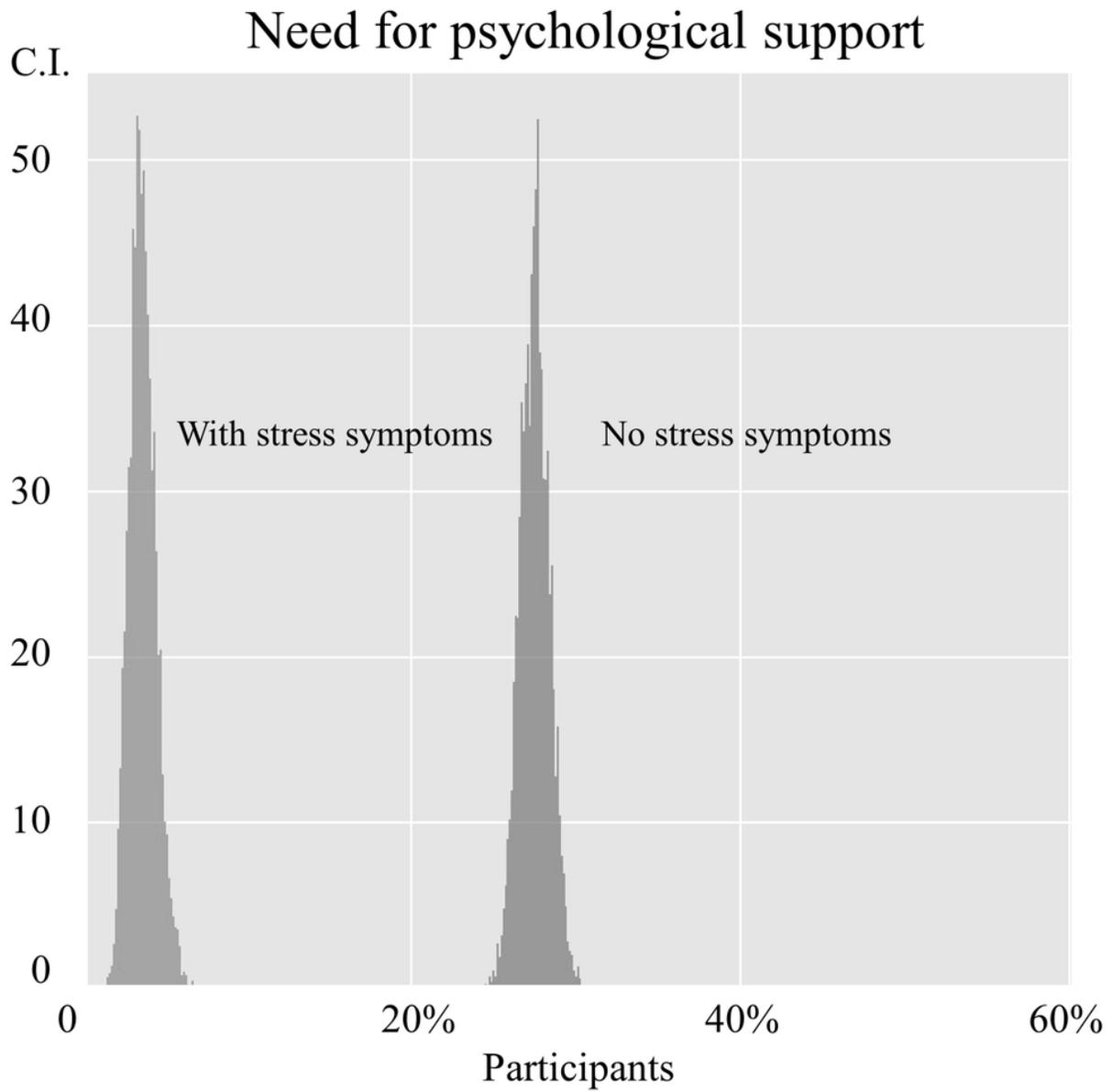


Figure 2

Need for psychological support in participants with and without stress symptoms

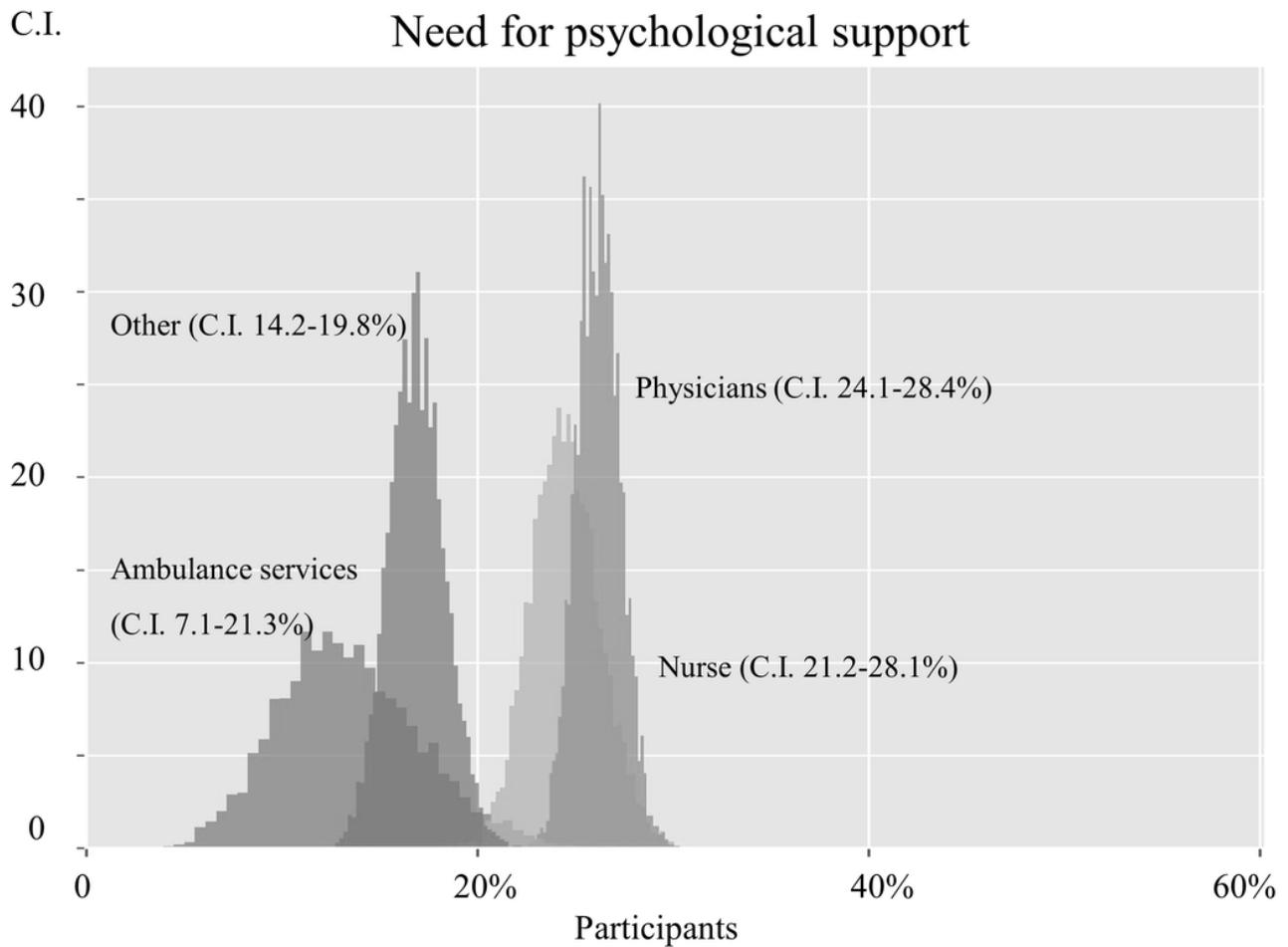


Figure 3

Need for psychological support according to professional categories

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