

# BMJ Open Mental health of healthcare professionals during the ongoing COVID-19 pandemic: a comparative investigation from the first and second pandemic years

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## ABSTRACT

Healthcare staff have been facing particular mental health challenges during the COVID-19-pandemic. Building on a first study at the beginning of the pandemic in March 2020, we aimed to investigate among healthcare professionals in Germany and Austria (1) how mental health may have changed in professionals over the course of the ongoing pandemic, (2) whether there are differences between different professional groups regarding mental health, (3) which stress factors may explain these mental health outcomes and (4) whether help-seeking behaviour is related to caretaker self-image or team climate. Between March and June 2021, N=639 healthcare professionals completed an online survey including the ICD-10 Symptom Rating checklist, event-sampling questions on pandemic-related stressors and self-formulated questions on help-seeking behaviour and team climate. Findings were analysed using t-tests, regressions and comparisons to a sample of healthcare professionals assessed in 2020 as well as to norm samples. Results show that mental health symptoms, particularly for depression and anxiety, persist among healthcare staff in the second pandemic year, that symptom prevalence rates are higher among nursing staff compared with physicians and paramedics and that team climate is associated with mental health outcomes. Implications of these findings in relation to the persisting pandemic and its aftermath are discussed.

## INTRODUCTION

It is well established by now that healthcare staff has been seriously affected by the COVID-19-pandemic.<sup>1 2</sup> A series of meta-analyses consistently showed that the prevalence of psychological disorders in health professionals is elevated. In particular, symptoms of depression, anxiety and distress,<sup>3</sup> as well as insomnia,<sup>4</sup> are significantly higher than before the beginning of the COVID-19 pandemic.

### Unknown factors: long-term consequences and differential effects across professional groups

As the pandemic and the complex psychological strain accompanying it persist, it is

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The first study that compared healthcare professionals' mental health over a longer period of time during the COVID-19 pandemic (ie, comparison of a sample in May to July 2020 to a sample in March to June 2021).
- ⇒ The study involves and compares between participants from various professions in the healthcare sector.
- ⇒ The study investigates several potentially relevant factors for mental health of healthcare professionals including help-seeking behaviour and caretaker self-image, as well as team climate using established and validated scales such as the ICD-10 Symptom Rating checklist, the Caregiver Role Identity Scale and the Prosocialness Scale for Adults.
- ⇒ Data are cross-sectional which limits the possibility of making causal claims.
- ⇒ Data may be biased by self-selection: the healthcare workers suffering the most may not have participated and thus the high prevalence rates observed may underestimate the actual psychological strain.

especially worrying that the potential long-term consequences of this situation are unknown. On the individual level, being exposed to extreme psychological strain for a prolonged time may result in lasting negative consequences; acute conditions developed as a response to these stressors can become chronic, and psychological conditions may entail physiological comorbidities.<sup>5</sup> If the affected individuals are healthcare staff, these individual consequences can have further devastating effects on national healthcare systems. Increasing sickness absence rates and a rising number of people resigning and seeking out other careers might ensue. This would further exacerbate existing issues brought on by staff shortage and worsen working conditions, thus creating a vicious

cycle for the remaining staff. This as well as increased exhaustion and reduced resilience among the remaining staff would result in decreasing quality of patient care.<sup>6,7</sup>

So far, findings on the development of mental health symptoms in healthcare professionals (HP) over time during the pandemic have been inconsistent, with some studies showing increasing levels<sup>8</sup> while others find decreasing levels of symptoms.<sup>9,10</sup> However, these studies considered changes in mental health for short periods of time only, and—to our knowledge—there are no studies yet investigating the development of mental health over more than a couple of months.

A group that has been investigated more intensively than other professional groups is nursing staff, which is known to be exposed to staff shortages and extreme workload.<sup>6</sup> Such difficulties resulting in lowered resources regarding time and emotional capacities are bound to reduce the quantity and quality of social support due to decreased opportunities to offer it; this decrease in social support is, in turn, likely to further worsen capabilities for coping with these stressors and other difficulties, creating a downward spiral. However, the healthcare sector consists of multiple professional groups whose working conditions differ, potentially resulting in differential effects caused by pandemic changes. For example, nurses and physicians at the same hospital share their work environment while taking on different tasks with distinct responsibilities and demands. By comparison, paramedics are mobile rather than stationary. They work under high levels of stress, as the nature of their work consists of unpredictable and emergency situations, and they might be at higher risk of contracting COVID-19.<sup>11</sup> While doctors and nurses stay with a patient for a prolonged time and will typically know the progression of the illness or condition and the treatment outcome, paramedics respond to emergencies and hence have contact with more patients for shorter periods of time, without knowing the patients' treatment outcomes. This may be associated with psychological advantages and disadvantages.<sup>12</sup> Knowledge about the differential effects of the pandemic on professional groups within the healthcare sector is important for identifying the most vulnerable groups and tailoring support structures to their particular needs. However, this has not yet been investigated in the existing pandemic-related literature. For instance, a rapid review on mental health during the COVID-19 pandemic was not able to identify studies comparing nursing staff with primary care staff.<sup>13</sup>

### Help-seeking behaviour in the face of mental health problems

While there are well-known and efficient treatments for various mental disorders, HPs hesitate to seek help for psychological suffering. This was evident before the pandemic<sup>14</sup> and reconfirmed during the pandemic.<sup>3</sup> Professionals' self-image may play a major role in the hesitancy to seek help. If people see themselves as a caregiver (Caregiver Role Identity Scale, *CRIS*), they might be less likely to seek help for themselves, as they do not identify

as a person in need of help but rather as one giving help and they may regard these roles as mutually exclusive.<sup>15</sup> This caregiver self-image can be expected to reflect both attitudes—that is, self-concept—as well as behaviour. In other words, people who view themselves strongly as caregivers are expected to have a higher propensity to display prosocial behaviour.

Furthermore, all types of stigma negatively influence potential help seeking<sup>16</sup> and there appears to be stigma attached to mental illness within the medical professions.<sup>17</sup> This stigma is linked to the social perception of an invincible doctor,<sup>18</sup> strength and self-sacrifice. Fear of stigmatisation strongly discourages HPs from help-seeking behaviour despite frequently reported mental health problems.<sup>16,18</sup> The fear of stigma in this context includes fear of negative career impact, fear of prejudice, lack of confidentiality and fear of being perceived as weak.<sup>17</sup> The idea of not showing weakness, in particular, comes with the ideal of self-sacrifice, of putting patients and others before one's own needs and ideally not expressing those needs. Not speaking up about suboptimal conditions, problems or mental health issues due to these fears may lead to a climate of silence within the team and have detrimental effects that extend well beyond the individual.<sup>19,20</sup> A team climate (TC) pervaded by a general expectation to prioritise patient care before personal well-being and to refrain from acts that could be interpreted as displaying weakness, such as seeking professional help,<sup>14</sup> could be a crucial factor inhibiting help-seeking behaviour.

### Study aims

Using a comparative investigative approach, we collected new data and compared these to a first study<sup>3</sup> in an effort to understand (1) how mental health may have changed in HPs over the course of the pandemic, (2) whether the same stress factors which were significantly related to psychological strain in 2020<sup>3</sup> were still the major impacting factors for HPs' mental health in 2021, (3) whether there are differences between different professional groups regarding mental health and (4) whether help seeking is related to caretaker self-image and TC. Specifically, we expected that (H1a) mental health problems among healthcare staff would have decreased with the adaptation to the pandemic (habituation hypothesis) or that (H1b) they would have increased due to exhaustion resulting from the persistent stress (wear-out hypothesis). We further expected that (H2) nursing staff's mental health would be more affected than that of other professional groups, paralleling the results from the first study<sup>3</sup> and that (H3) paramedics' mental health would be more affected than physicians'. We also hypothesised that (H4) decreased likelihood to seek help would be positively related to stronger caretaker self-image (*CRIS*) as well as more prosocial behaviour (measured as the behavioural parallel to the purely attitudinal self-image) and that (H5) a positive TC would facilitate better mental health outcomes and (H6) increase the likelihood of help seeking.

## METHOD

We conducted a cross-sectional online survey on mental well-being, perceived pandemic-related stress factors and help-seeking behaviour among medical professionals.

### Measures

The survey took about 15 min to complete and started with a section on demographics, followed by basic facts about the features of participants' work, such as whether they had contact with patients with COVID-19 and whether their working hours had changed during the pandemic.

In the subsequent section, participants were presented with a list of potential stress factors based on the previous study.<sup>3</sup> They were asked to rate the extent to which they were affected by each stress factor on a 5-point ordinal scale (*not at all* to *extremely* or *does not apply*). Following this, mental well-being was measured with the self-report questionnaire ICD-10 Symptom Rating (ISR),<sup>21</sup> including 29 items forming subscales for depression, anxiety, eating disorders, obsessive compulsive disorder and somatoform disorder symptoms as well as an *extra*-subscale with various additional symptoms. As the ISR is intended for clinical diagnostic use, the *extra*-subscale contains miscellaneous individual symptoms and pieces of information which do not constitute a disorder by themselves but should indicate to the clinician that further exploration is needed; the items include symptoms of depersonalisation and derealisation, sexual disorders, external stressors and past physical head traumas. This subscale is part of the standard ISR interpretation. The item ratings on a 5-point ordinal scale (from 0—*does not apply* to 4—*extremely*) are averaged to compute subscale scores as well as a total score. The internal consistency and retest reliability of the ISR scales have been demonstrated to be good.<sup>22</sup>

We chose the ISR because there is a large non-clinical German norm sample available which was assessed before the pandemic (P-).<sup>21</sup> We hence refer to it as reference group  $R_{p-}$ . As a second reference group, we included a large sample of the general public assessed at the peak of the first pandemic wave (P+) in Germany,<sup>23 24</sup> reference group  $R_{p+}$ . We were also able to compare our data to a sample of healthcare professionals  $R_{HP2020}$  that we assessed at the beginning of the pandemic, that is, 1 year before the current sample.<sup>3</sup>

Following the mental health section, we explored help-seeking behaviour and intentions. To this end, we assessed whether participants had sought help for the psychological strain they had experienced and why or, if they had not, whether they would like to do so in the future and why or why not. Moreover, we assessed the extent of participants' self-image as a caregiver, their propensity for prosocial behaviour, as well as perceived TC and the extent to which the TC allows or sanctions seeking help and admitting to mental health problems. We measured the first two constructs using German translations of the CRIS<sup>25</sup> and the Prosocialness Scale for Adults (PSA).<sup>26</sup> We assessed TC with a set of 17 items that referred to how participants perceived the communication among

colleagues (eg, 'My colleagues talk to me about their worries and issues') and social comparisons among colleagues regarding strength and resilience in the face of difficulties (eg, 'My colleagues can deal with issues better than I do').

### Sample

As we aimed for a large-scale survey and were interested in examining simple correlations rather than testing treatment effects or causalities across time, we did not aim for a predefined sample size; instead, our goal was maximum recruitment, that is, finding as many participants as possible within our predefined time frame. Participants were recruited through healthcare providers, unions, a press release and personal contacts between 15 March and 6 June 2021 in Germany, Austria and the German-speaking regions of Switzerland. In Austria, safety measures had been lifted in February, with a new wave of infections starting in March 2021; in April, some Austrian states (Vienna, Lower Austria, Burgenland) introduced a new lockdown which lasted several weeks. During this period, testing capacities were expanded massively across the country and the vaccination campaign was picking up pace, with roughly 40% of the vaccinable population being vaccinated at least once until mid-May.<sup>27</sup> Similarly, in Germany, safety measures were lifted at the beginning of March, with a new wave of infections and the reintroduction of lockdown measures by the end of the month, in parallel to the roll-out of a national vaccination campaign.<sup>28</sup> The wave peaked mid-April, reaching a new high of intensive care unit cases. In May, case numbers started to drop again, accompanied by an increasing vaccination rate and the reduction of safety measures.

To be included in our study, participants were required to work in one of the areas of the healthcare sector, either in private or in public institutions. This included professional groups such as medical and nursing staff as well as social workers, midwives, pharmacists, physical therapists, physiotherapists, psychologists and psychotherapists. If none of these categories applied, participants had the option 'other', under which they could specify their profession. Participants were excluded if they did not work in any area of healthcare or if they did not complete all the required fields. As the invitation to participate was circulated through various channels, the exact response rate could not be determined. However, out of 993 respondents who answered at least one question we had to remove 354 records (36%) because they did not meet all the inclusion criteria.

Participants gave their informed consent for participation in the study and for electronic storage of their responses. Along with their responses, no personally identifiable information was collected.

In total, we recruited 639 participants from Austria (n=476), Germany (n=161) and Switzerland (n=2) working in more than 13 different professions in healthcare (see table 1).

**Table 1** Distribution of participants' professions by gender and country

Profession	Sample size		Gender		Country		
	n	Rel (%)	F	M	DE	AT	CH
Paramedic	212	33	64	146	4	207	1
Inpatient nursing care	97	15	71	26	52	45	0
Inpatient elder care	81	13	73	8	36	45	0
Home care	72	11	65	7	25	47	0
Inpatient physician	67	10	31	35	4	63	0
Non-medical health sector	28	4	19	9	5	23	0
Social worker	19	3	13	5	8	11	0
Physical therapist	12	2	11	1	5	7	0
Physician's assistant	6	1	6	0	4	2	0
Psychotherapist	5	1	3	2	3	2	0
Independent physician	4	1	0	4	0	4	0
Midwife	2	0	2	0	2	0	0
Pharmacist	2	0	0	2	0	2	0
Other	32	5	23	9	13	18	1
Total	639	100	381	254	161	476	2

Four participants identified themselves as diverse.

AT, Austria; CH, Switzerland; DE, Germany; F, female; M, male; n, total; Rel, relative percentage.

### Patient and public involvement

The design of the survey was informed by five semistructured interviews with nursing staff on the barriers they were facing at their workplace as well as the reasons for seeking or not seeking help. The participants were provided with the contact information of the leading researcher at the beginning and the end of the survey, where they could request a summary of the study results by sending an email. Moreover, organisations and employers in the healthcare sector who helped with recruitment by disseminating the survey among their employees or members also received a summary on completion of the data collection.

### Analysis

All analyses were conducted using the statistics software R (V.4.2.0)<sup>29</sup> in RStudio<sup>30</sup> and numerous helper packages. Aside from basic descriptive statistics, analyses of variance (ANOVAs), t-tests and  $\chi^2$  tests were computed to compare groups. After checking for the test prerequisites, multiple linear regressions were conducted to estimate the importance of stress factors, and binary logistic regression was used to estimate ORs for help seeking. We applied a level of significance of 5% for inferential tests. In order to reduce the risk of alpha error inflation we corrected all p values using the Benjamini-Hochberg procedure. All the core analyses considered the complete data set, while participants with missing values in non-essential measures, for example, barriers to help seeking, were excluded from analysis where appropriate. We did not rebalance the sample by weighting for membership in professional groups or other characteristics, but report

the results as is. When reporting statistical results we use abbreviations as suggested by the guidelines of the American Psychological Association, for example, *M* for mean, *SD* for standard deviation, *df* for degrees of freedom, *b* for regression coefficients,  $R^2$  for the regression determinant,  $1-\beta$  for test power, *d* for the effect size Cohen's *d* and OR for odds ratio. *F*, *t*, *z* and  $\chi^2$  refer to the respective probability distributions. Where appropriate, we provide 95% CIs.

## RESULTS

### Mental health

Prior to analysing the ISR scores, we examined their internal consistency. The results were almost identical to previous findings, with Cronbach's  $\alpha$  ranging from  $\alpha=0.76$  to  $\alpha=0.87$  for the subscales and  $\alpha=0.94$  for the total scale.

The observed severity of clinical symptoms was high on all five scales (see table 2). In particular, depression and anxiety symptoms were reported with unexpectedly high severity, with 6.5% reporting severe depression symptoms and another 55% light to medium symptoms. A total of 29% reported at least light symptoms of anxiety. A split by gender of these results is shown in online supplemental tables S1 and S2.

For all symptom scales, HPs scored significantly higher than the reference group  $R_p$  before the pandemic ( $df \geq 797.34$ ,  $\geq 3.29$ ,  $p < 0.001$ ). The comparison between the samples of 2020 and 2021 showed support for the habituation hypothesis H1a: when controlling for profession there were no significant changes from 2020 to 2021

**Table 2** Severity of symptoms in ISR of healthcare professionals assessed in 2021 (HP2021) compared with previous year (HP2020) and the two reference groups of non-clinical sample before (P-) and during (P+) the pandemic

Scale	Group	None (%)	Suspected (%)	Light (%)	Medium (%)	Severe (%)
Anxiety	HP2021	61.7	9.2	17.9	8.4	2.8
	HP2020	52.3	6.3	24.7	11.7	5
	P+	70.7	5.9	12.8	7.4	3.2
	P-	71.8	7.2	16.1	4.2	0.7
Depression	HP2021	28.3	10	30	25.2	6.5
	HP2020	18	7.3	40	25.3	9.3
	P+	42.3	10	29.1	13.7	4.8
	P-	68.1	8.9	17.1	4.8	1.1
Compulsion	HP2021	61.9	8.1	20.1	7.2	2.8
	HP2020	56.7	9	22	9	3.3
	P+	67.4	7.9	13.8	6.9	4
	P-	75.9	8	12.8	4.2	0.7
Somatoform	HP2021	56.1	23.3	7.8	10.4	2.3
	HP2020	42.3	30.3	9	15.3	3
	P+	69.4	18.9	4.6	5.1	2
	P-	62.3	12.1	22	3.2	0.4
Eating disorder	HP2021	41.5	11.2	27.4	16.5	3.4
	HP2020	30	12	31	20.3	6.7
	P+	43.1	11.8	25.1	13.6	6.3
	P-	52.8	12	22.6	11.2	1.4
ISR total	HP2021	45.6	6.1	17.6	22.7	8.1
	HP2020	30.3	9	20	29.3	11.3
	P+	58.7	6.1	14.4	15.7	5
	P-	68	6.8	11.5	10.2	3.5

ISR, ICD-10 Symptom Rating.

on the overall ISR scores ( $F(1, 496)=0.003$ ,  $p=0.952$ ), nor in the depression scores ( $F(1, 496)=1.00$ ,  $p=0.465$ ), or in the anxiety scores ( $F(1, 496)=0.40$ ,  $p=0.660$ ). However, HPs continued to display significantly more symptoms than the general population reference group during the pandemic ( $R_{p+}$ ) on both the depression scale (difference in means  $\Delta M=0.32$ , 95% CI (0.24, 0.41),  $t(2411)=7.64$ ,  $p<0.001$ ) and the anxiety scale ( $\Delta M=0.12$ , 95% CI (0.04, 0.2),  $t(1168.2)=3.06$ ,  $p=0.005$ ). Although this comparison is limited by the fact that the general population pandemic reference group was assessed during the first wave of the pandemic while our data were collected during the third wave, this suggests that HPs' psychological strain cannot be explained by lockdown measures alone. Most notably, their rate of severe symptoms was significantly higher on both the depression scale ( $\chi^2(1, N=2285)=520.91$ ,  $p<0.001$ ) and the anxiety scale ( $\chi^2(1, N=2338)=513.78$ ,  $p<0.001$ ).

### Mental health by profession

We compared the mental health scores of the three major professional groups in our sample, that is, nurses,

physicians and paramedics, representing about 78% of all participants (see [table 3](#)).

While physicians and paramedics scored similarly regarding anxiety, depression and total ISR scale, nurses scored significantly higher, providing evidence for our H2. This was supported by three two-factor ANOVAs considering both profession and time (see [table 4](#) and [figure 1](#)). However, contrary to our H3, there was no significant difference between paramedics and physicians.

### Stress factors

Next, we investigated to what extent the individual stress factors contributed to anxiety and depression. A multiple regression of ISR depression scores on the eight stress factors ( $R^2=0.205$ ,  $F(8, 616)=19.83$ ,  $p<0.001$ ) showed that *job insecurity* was the most influential but simultaneously rarest predictor of depression symptoms (see [figure 2](#)). That is, on average, participants felt almost unaffected by job insecurity ( $M=0.83$ ,  $SD=1.08$  on scale from 0 to 4), but for those who did experience job insecurity, higher levels of job insecurity were strongly associated with psychological symptoms. *Anxiety about infection of family members* and

**Table 3** Severity of symptoms in ISR split by professional group

Scale	Group	n	None (%)	Suspected (%)	Light (%)	Medium (%)	Severe (%)
Anxiety	Nursing	252	50.8	13.5	20.6	11.1	4
	Physicians	70	72.9	10	7.1	7.1	2.9
	Paramedics	211	73.9	3.3	17.1	5.2	0.5
	Other	106	58.5	9.4	18.9	9.4	3.8
	P–	2512	71.8	7.2	16.1	4.2	0.7
Depression	Nursing	252	20.6	7.9	28.2	33.3	9.9
	Physicians	70	35.7	17.1	27.1	17.1	2.9
	Paramedics	211	37.9	11.4	29.9	18	2.8
	Other	106	22.6	7.5	35.8	26.4	7.5
	P–	2512	68.1	8.9	17.1	4.8	1.1
Compulsion	Nursing	252	50.8	9.5	28.6	7.5	3.6
	Physicians	70	71.4	4.3	12.9	8.6	2.9
	Paramedics	211	73.9	7.1	10.4	7.1	1.4
	Other	106	59.4	8.5	23.6	4.7	3.8
	P–	2552	75.9	8	12.8	4.2	0.7
Somatoform	Nursing	252	45.2	25.8	9.9	15.5	3.6
	Physicians	70	68.6	20	7.1	2.9	1.4
	Paramedics	211	64.9	22.7	3.8	7.6	0.9
	Other	106	56.6	21.7	10.4	8.5	2.8
	P–	2512	62.3	12.1	22	3.2	0.4
Eating disorder	Nursing	252	36.9	10.7	27.4	20.2	4.8
	Physicians	70	54.3	8.6	28.6	8.6	
	Paramedics	211	45.5	13.3	26.1	10.9	4.3
	Other	106	37.7	9.4	28.3	23.6	0.9
	P–	2512	52.8	12	22.6	11.2	1.4
ISR total	Nursing	252	34.1	4.4	18.3	31	12.3
	Physicians	70	62.9	2.9	15.7	15.7	2.9
	Paramedics	211	57.3	10	13.7	15.2	3.8
	Other	106	39.6	4.7	23.6	21.7	10.4
	P–	2512	68	6.8	11.5	10.2	3.5

P– refers to a non-clinical sample assessed before the pandemic.  
ISR, ICD-10 Symptom Rating; n, sample size.

*protective measures that hinder work processes* also predicted the level of depression symptoms. Regressing ISR anxiety scores on these stress factors ( $R^2=0.097$ ,  $F(8, 616)=8.27$ ,  $p<0.001$ ) revealed a similar picture, with *job insecurity* and *anxiety about infection of family members* both positively associated with anxiety symptoms (see [figure 2](#) and online supplemental tables S3 and S4).

Professionals with direct patient contact ( $M=0.71$ ) did not differ from those in administration (categorised based on profession,  $M=0.8$ ,  $t(74.5)=1.03$ ,  $p=0.921$ ,  $1-\beta(d=0.5)=0.98$ ) in terms of symptom severity. However, people with pre-existing medical conditions were significantly more anxious ( $M_{\text{yes}}=0.9$ ,  $M_{\text{no}}=0.6$ ,  $t(293.3)=3.85$ ,  $p<0.001$ ) and reported more severe symptoms overall ( $M_{\text{yes}}=0.92$ ,  $M_{\text{no}}=0.64$ ,  $t(290.3)=5.16$ ,  $p<0.001$ ) than those without such conditions putting them at heightened risk during the pandemic.

Paralleling our previous results,<sup>3</sup> participants reported that they were most affected by the uncertain duration of pandemic-related changes and by protective measures to avoid spreading the virus impeding their contact with the patients and work processes in general. The pandemic also led to various changes in work procedures which persisted 1 year after its beginning, as did the severe limitations of contact to colleagues. [Table 5](#) provides an overview of the stress factors and their respective mean effects.

### Help seeking

While the majority of participants described themselves as experiencing symptoms of depression and anxiety, most declined when asked whether they would like to receive psychological support to deal with the crisis (see [table 6](#)). Out of the 639 participants, 348 (54%) scored

**Table 4** Results of three separate ANOVAs on anxiety, depression and ISR total scores, respectively, by time (2020 vs 2021) and profession (nursing vs physicians)

Scale	Effect	F	df <sub>1</sub>	df <sub>2</sub>	p value	η <sup>2</sup>
Anxiety	Time	0.40	1	496	0.660	0.001
	Profession	7.96	1	496	0.010	0.016
	Time×profession	0.44	1	496	0.653	0.001
Depression	Time	1.00	1	496	0.465	0.002
	Profession	25.93	1	496	<0.001	0.050
	Time×profession	0.86	1	496	0.490	0.002
ISR total	Time	0.003	1	496	0.952	<0.001
	Profession	21.35	1	496	<0.001	0.041
	Time×profession	0.33	1	496	0.557	<0.001

η<sup>2</sup> refers to the effect size.

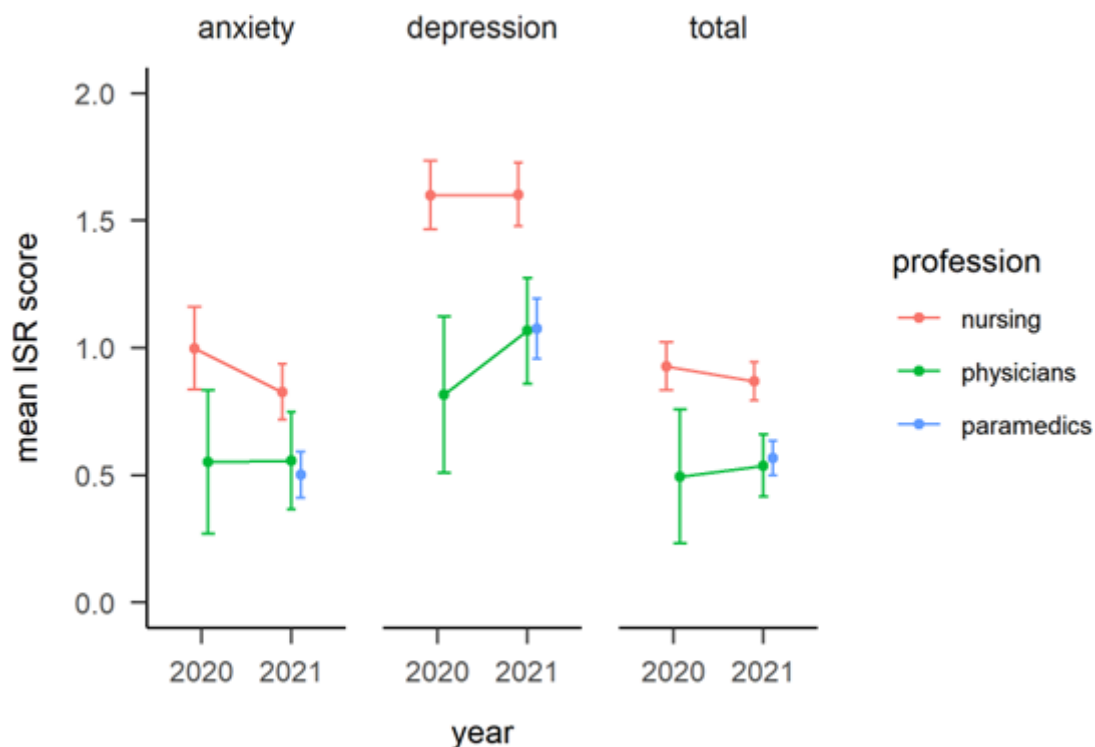
ANOVA, analysis of variance; ISR, ICD-10 Symptom Rating.

0.5 or higher on the ISR total scale, which would give them a *suspected* clinical diagnosis or more severe; and yet only 49 (14%) of these participants said that they would consider seeking psychological support. Participants with higher ISR scores were more likely to seek help ( $b=1.21$ ,  $OR=3.35$ ,  $z=5.41$ ,  $p<0.001$ ).

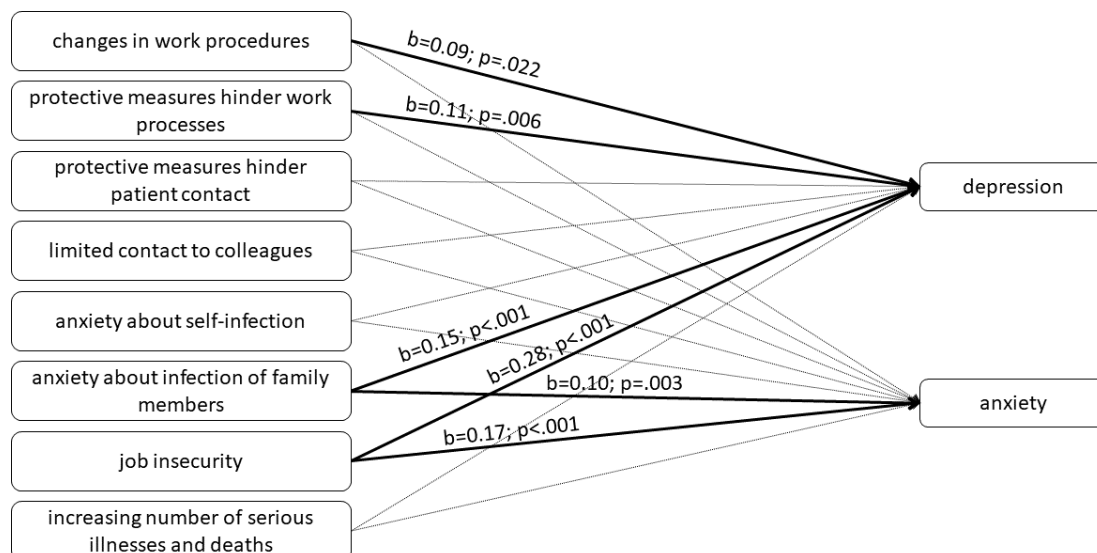
HPs gave various reasons for not seeking help in spite of severe psychological symptoms. One hundred and forty-two (41%) of the 348 participants whose symptoms were severe enough to supposedly warrant psychological support claimed that others needed the support more urgently. Eighty-six (25%) did not know any suitable support services. Eighty-five (25%) did not perceive

themselves as distressed enough to require support (in spite of their reported symptom severity). Finally, 81 (23%) reported lacking the time to seek help. The majority—84% of all participants and 83% of those who supposedly needed help—indicated that they had sufficient social support outside the workplace.

Contrary to our expectation (H4), neither the caregiver self-image (CRIS) nor the level of prosocialness (PSA) predicted whether a person would seek help. Accordingly, the goodness of fit of this predictive model is low ( $McFadden\ pseudo-R^2=2.2\%$ ), implying that there are better predictors for help-seeking behaviour than those included in our model.



**Figure 1** Comparison of mental health scores across professions and years. The subsample of paramedics in 2020 was too small for analysis. ISR, ICD-10 Symptom Rating.



**Figure 2** Results of two multiple regressions on stress factors. *b*=unstandardised regression coefficient; only significant paths are labelled. ISR depression:  $R^2=0.205$ , adjusted  $R^2=0.194$ ,  $F(8, 616)=19.83$ ,  $p<0.001$ . ISR anxiety:  $R^2=0.097$ , adjusted  $R^2=0.085$ ,  $F(8, 616)=8.27$ ,  $p<0.001$ . ISR, ICD-10 Symptom Rating.

### Team climate

We assessed the quality of all items of the TC scale and removed four items due to high difficulty or low discrimination. A Kaiser-Meyer-Olkin test of the factors resulted in a measure of sampling adequacy of  $MSA=0.773$ , indicating that the scale comprises subscales. Both a scree plot and the Kaiser-Guttman criterion suggested a two-factor solution. A subsequent factor analysis with varimax rotation revealed two clearly distinct components. The first factor (TC1) refers to social comparisons with coworkers in terms of strength and resilience

to strain (or the lack thereof), while the second factor (TC2) refers to open communication among colleagues. Both subscales ( $Cronbach's \alpha_{TC1}=0.80$ ;  $\alpha_{TC2}=0.76$ ) as well as the total work culture scale ( $\alpha=0.79$ ) had good internal reliability.

Using this scale, TC was a good predictor of participants' mental well-being. Both a low tendency to evaluate social comparisons of one's own resilience with coworkers negatively (TC1) and open communication among colleagues (TC2) seem to have influence on the reported symptoms (ISR total) as illustrated by a standardised regression

**Table 5** How strongly are you affected by the following aspects during the COVID-19 pandemic at your workplace? (0=not at all; 4=extremely)

Stress factor	2020 <sup>a</sup>			2021		
	n	M	SD	n	M	SD
Uncertainty on duration of pandemic-related changes.				632	2.93	1.15
Protective measures hinder patient contact.	285	2.76	1.03	623	2.69	1.09
Limited contact to colleagues.	287	2.18	1.13	622	2.55	1.14
Protective measures hinder work processes.	297	2.58	1.00	631	2.54	1.06
Changes in work procedures.	298	2.57	1.04	631	2.54	1.03
Anxiety about infection of family members.	290	2.30	1.25	589	2.17	1.30
Need for childcare in own household.*	091	2.36	1.51	250	1.94	1.49
Bad communication of change in work procedures.				589	1.84	1.22
Worry that protective measures are used inadequately.				584	1.76	1.19
Increasing number of serious illnesses and deaths.	243	1.29	1.18	548	1.76	1.19
Anxiety about self-infection.	285	1.78	1.18	560	1.53	1.15
Fear of insufficient supply of protective measures.				540	1.37	1.19
Job insecurity.	234	1.16	1.25	392	0.83	1.08

Comparison between assessments in 2020 and 2021.

\*This item was presented conditional on the response to a previous question about having children; number of children not assessed. M, mean; n, sample size.



**Table 6** Frequency of responses to 'Would you like to receive psychological support to deal with the crisis?' categorised by presumed need for support based on ISR scale

Would you seek psychological help?	in need		Total
	No	Yes	
No, I am fine.	184	75	259
No, I get sufficient support.	38	47	85
No, I prefer to deal with it on my own.	15	57	72
I will consider it.	16	39	55
Yes, but not psychotherapy.	3	5	8
Yes, psychotherapy.	0	5	5
No answer	35	120	155
All	291	348	639

'No' means  $ISR < 0.5$ ; 'Yes' means  $ISR \geq 0.5$ .  
ISR, ICD-10 Symptom Rating.

(table 7). Those working in a positive TC had significantly better mental health, confirming our H5.

Does TC also predict whether a person is willing to seek help for mental health issues? A logistic regression among those who supposedly need help ( $ISR \geq 0.5$ ) revealed that the TC1 scale (social comparisons) had a slightly negative impact on the likelihood to seek help (OR=0.93,  $p=0.048$ ), while subscale TC2 was not significantly related to help seeking ( $p=0.354$ ). However, the goodness of fit of this model is low (McFadden pseudo- $R^2=3.2\%$ ), thus not providing sufficient evidence for our H6.

## DISCUSSION

Consistent with reports from other countries,<sup>1 31–35</sup> HPs in Germany, Austria and Switzerland reported high levels of depression and anxiety during the continuation of the pandemic. The scores were similar to those reported in another German sample<sup>36 37</sup> assessed under more severe lockdown conditions. Moreover, comparisons show that mental stress levels of healthcare staff were consistently above those reported by a general population sample during the pandemic; nevertheless, reported help-seeking behaviour and intentions were low.

### Mental health in 2020 and 2021

The high prevalence of psychological disorders among HPs observed at the beginning of the pandemic<sup>3</sup>

continues in our sample 1 year onwards. Studies on the mental health effects of the COVID-19 pandemic on healthcare staff from other countries conducted at the beginning of the pandemic in 2020<sup>38</sup> place the prevalence of severe symptoms between 2.2% and 14.5%.<sup>39</sup> The results of both Weibelzahl *et al*<sup>3</sup> and the present study are in line with this. While at the beginning societies across the globe were made aware of the crucial importance of healthcare workers, resulting in abundant expressions of appreciation for *essential workers*—with front-line medical staff representing a key group—this attention slowly dwindled as the pandemic lingered on. The psychological strain, however, persisted. Crucially, we also found that those healthcare workers who suffer from a pre-existing medical condition and are thus at a heightened risk during a pandemic continued to suffer from significantly higher psychological strain than others. Seeing as public concern for 'risk groups' also dwindled away as the pandemic continued, this subgroup of healthcare staff requires particular attention and support as they are affected by intersecting stressors.

Research findings are inconsistent regarding the development of mental health symptoms over time in HPs during the pandemic with increases in Argentinian HPs,<sup>8</sup> but declining trends in Belgian front-line healthcare<sup>10</sup> and in HPs in Spain<sup>9</sup> from spring to summer/autumn 2020. The latter is in line with trends for the general population—for instance, Wang *et al*<sup>37</sup> identified a significant decline of the psychological impact 4 weeks after the beginning of the pandemic. However, all the studies indicated high distress scores throughout the study periods. Along with the absence of a significant change in most symptoms over time (except for anxiety), the present study found high levels of symptoms of depression (with 71.7% of HPs fulfilling criteria for at least a *suspected diagnosis*), eating disorders (58.9% at least *suspected*), somatoform disorders (43.9% at least *suspected*), anxiety (38.3% at least *suspected*) and compulsion (38.1% at least *suspected*). To our knowledge, this is the first study that compared HPs' mental health over a longer period (ie, comparison of a sample in May to July 2020 to a sample in March to June 2021). While the research design at hand is not a full-fledged within-participant longitudinal study, the similarly recruited samples at both time points allow us to draw a more substantial comparison than previous literature. In light of this, measures to

**Table 7** Standardised regression of ISR total score on subscales of team climate (TC)

Predictor	Beta	95% CI	t	df	p value
TC1 (not ashamed)	−0.46	(−0.53, −0.40)	−13.58	636	<0.001
TC2 (open communication)	−0.22	(−0.29, −0.15)	−6.51	636	<0.001

Beta=standardised regression coefficient.  
 $R^2=0.321$ , adjusted  $R^2=0.319$ ,  $F(2, 636)=150.55$ ,  $p<0.001$ .  
ISR, ICD-10 Symptom Rating.

reduce psychological strain among these workers are urgently needed—particularly as the consequences of the psychological distress can be expected to outlive the end of the pandemic. In addition to individual suffering, this is also a problem for the healthcare system and patients: depression and fatigue have been shown to correlate with major medical errors<sup>7</sup> and quality of care.<sup>6</sup>

### Differences between nursing staff, physicians and paramedics

The present study found significant differences in mental health between physicians and paramedics on the one hand and nursing staff on the other. This is in line with a rapid review that concluded that nursing staff may have a higher risk of mental health problems during the COVID-19 pandemic.<sup>12</sup> Furthermore, Cai *et al*<sup>40</sup> found that nursing staff felt more anxious and nervous compared with other professionals during the pandemic. Lai *et al*<sup>41</sup> reported more severe levels of mental health symptoms for nursing staff, but also for front-line healthcare workers, those working in Wuhan, China, and for women. While excessive workload and inadequate personal protective equipment might be factors associated with poorer mental health for all professional groups, there are some differential factors between professional groups that may explain different outcomes.

These differential factors may not be pandemic specific but rather originating from more permanent aspects, such as difficulties of the nature of the work, nurses feeling inadequately supported, suffering from higher employment insecurity, facing issues with the management, patients and doctors as well as horizontal violence.<sup>42</sup> This is in line with our study that found job insecurity to be the most influential predictor of depression symptoms. For middle-aged and older adults in Europe, perceived insecurity in employment and housing as well as economic problems are significantly associated with participants' mental health and psychological distress.<sup>43</sup> Thereby, the relationship between subjective well-being and perceived adversities is partially mediated by institutional trust. Nursing staff might suffer from greater employment insecurities, economic problems and have less institutional trust—factors that may increase their psychological distress.

Contrary to our expectations, our study could not identify significant differences in mental health outcomes between physicians and paramedics. A tentative explanation for the missing difference may be that the high stress baseline for paramedics is counterbalanced by the fact that they work 'outside' the hospital system. In other words, in contrast to nursing staff, they are not exposed to hierarchies and issues between professional groups inside the hospital. Other studies have identified high levels of emotional strain and burnout for paramedics during the pandemic,<sup>11</sup> but to our knowledge there are no studies yet that have

compared the mental health outcomes of paramedics to other professional groups. Future research might help shed light on relevant protective and risk factors for this group and how these may differ for other groups of HPs.

### Help seeking

In the present study the reported help-seeking intentions and behaviour were low. Even out of those who reported high levels of psychological strain, many were not seeking help, citing either concerns about the distribution of resources or accessibility issues. That is, they either assumed that resources for psychological support are limited and given this, they described themselves as less in need of these than others, or they did not know of any suitable services that met their needs or did not have free time to access such services. These results paralleled our previous study<sup>3</sup>; we thus sought to explain this behaviour in the present study, hypothesising that people who held a strong caregiver self-image would be less likely to seek help for themselves. The idea was that being a caregiver would be seen as something exclusive and binary—that is, that people would either view themselves as a giver or a recipient of care. However, we were not able to demonstrate this expected relationship. Given that the measurement instruments had been validated, it remains unclear why caregiver self-image does not predict help seeking. One possible explanation is that this binary idea is not actually inherent in the caregiver image. Rather, those who view giving and receiving care as mutually exclusive might be a subgroup which also holds toxic ideas about strength and help seeking as weakness, while the rest of the group might see giving and receiving help as going hand in hand. The instrument might therefore not have been specific enough. Also, the tests may not have been sensitive enough to detect changes and the sample size may have been too small to identify differences between the groups that were of unequal sizes. Additionally, self-report measures are, of course, subject to social desirability.

Furthermore, the large share of our sample stating that (1) they were not in need of support despite severely elevated levels of mental strain, that (2) they already had sufficient support and that (3) others needed support more urgently could be indicative of a climate that discourages help-seeking behaviour and speaking out about mental health issues in the healthcare community. However, contrary to our H6 we could not find a correlation between TC and help seeking. On the other hand, we could confirm a relationship between TC and mental health (H5). In other words, working in a positive TC can have significantly positive impacts on mental health for professionals in the healthcare sector. This might have led to a reduction in actual need for help in those participants who experienced a positive TC, which could explain why they did not display more help-seeking behaviour. It is crucial

that future research takes a closer look at the TC and work culture in the healthcare sector and the norms they set around mental health—more specifically into how a more positive TC can be fostered where this is necessary. Help seeking is stigmatised, as are mental health problems,<sup>16 17</sup> and participant responses may reflect that. The stigmatisation of health seeking as well as the rejection of people with mental illness is bound to a historical and cultural context. For instance, mental health stigma has decreased considerably in Germany since the 1990s.<sup>44</sup> A study found that Cuban professionals reported stronger mental health stigma and more willingness to seek help than German professionals.<sup>45</sup> For this reason, in particular exploratory qualitative studies seem warranted that take into consideration the cultural context of help seeking and mental health stigma. While social norms of this kind are complex and slow to change, it is crucial they be identified and addressed. If help-seeking behaviour truly is widely stigmatised in the healthcare community, improving the accessibility of support services alone is bound to have very limited effects on the rates of healthcare workers seeking help.

### Limitations

These findings are subject to certain limitations. First, even though it was the second time we administered the same questionnaire, our data are cross-sectional, as we could not ensure the participation of the same participants. This limits the extent to which causal claims are possible. While it is possible for us to report the extent to which participants themselves think pandemic-related work-specific stressors caused deteriorations in their mental health, a true test of causality over time, both for work-related stressors and help-seeking behaviour, would require true longitudinal data with within-participant observations. Second, our data may be biased by self-selection. While the online survey was widely accessible and fairly short, thus lowering the cognitive load required to complete it, it is conceivable that the healthcare workers suffering the most did not participate because they could not muster the time or mental energy. This would imply an underestimation of actual psychological strain among healthcare staff. In relation to this issue, only two participants from Switzerland chose to participate in the study, which means conclusions about the situation in the Swiss healthcare system cannot be drawn from these data. Finally, the healthcare systems of Austria, Germany and Switzerland differ slightly in regard to the insurance system. Nevertheless, they are comparable in regard to high overall costs and above average number of physicians per capita.<sup>46</sup> Future comparisons with additional countries might reveal whether the structure of the healthcare system affects resilience of staff.

### CONCLUSION

The present study shows that, presumably due to some habituation to the pandemic situation and its novelty wearing off, other mental health symptoms persist among healthcare staff in the second pandemic year. As preventative measures to reduce the spread of the virus persisted, so did limitations on opportunities to offer and seek social support, meaning that one key factor in coping with difficulties remained partly unavailable to healthcare staff. Moreover, novel stressors may have become more relevant since the collection of the data presented here, such as psychological violence and harassment of medical staff by COVID deniers. Since this problem has become dramatically more prevalent, as illustrated by the recent suicide of an Austrian doctor following months of severe harassment by COVID deniers and antivaccinationists,<sup>47</sup> future studies will need to address these novel stressors. Symptom prevalence rates continue to be higher among nursing staff compared with physicians and paramedics as well as among healthcare staff with pre-existing health conditions as opposed to others. Our study furthermore showed that an open and constructive TC is associated with better mental health. Future studies should also look into how this relation may be mediated by burnout. In conclusion, this means that we urgently need a higher level of appreciation, acknowledgement and professional validation in the healthcare sector, in particular for nursing staff. Furthermore, ready access to mental health services (including mental health screening, screening for suicidality and subsequent counselling) and protective services in case of harassment will play a pivotal role in reducing the risk of mental distress in this vulnerable group of HPs. The long persistence of the psychological strain as well as the continued low willingness to seek out psychological support should ring alarm bells for decision makers in the healthcare sector, as both may be the early signs of severe long-term consequences for the entire sector and, ultimately, patient care. What our research, alongside various other studies, has done is to establish that there is a need to provide mental health support to the healthcare community; the question that research must target next is why and when this need does and does not translate into uptake of support.

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## Supplementary Materials

**Table S1**

*Severity of symptoms in ISR split by gender (4 participants did not indicate their gender)*

scale	gender	N	none	suspected	light	medium	severe
anxiety	female	381	55.4%	10.8%	19.7%	10.2%	3.9%
	male	254	72%	6.7%	14.6%	5.9%	0.8%
depression	female	381	24.1%	8.4%	29.1%	31.2%	7.1%
	male	254	34.6%	12.6%	30.3%	16.9%	5.5%
compulsion	female	381	57.5%	8.7%	23.6%	7.3%	2.9%
	male	254	68.9%	7.1%	14.6%	6.7%	2.8%
somatoform	female	381	53.3%	23.1%	8.9%	11.5%	3.1%
	male	254	59.8%	24.4%	5.9%	8.7%	1.2%
eating disorder	female	381	36.7%	8.9%	30.7%	18.6%	5%
	male	254	49.2%	14.6%	22%	13%	1.2%
ISR total	female	381	38.8%	5.8%	18.6%	25.7%	11%
	male	254	56.3%	6.3%	15.4%	18.1%	3.9%

## MENTAL HEALTH OF HEALTHCARE PROFESSIONALS

2

**Table S2***Severity of symptoms in ISR split by age*

scale	age	N	none	suspected	light	medium	severe
anxiety	<30	206	57.3%	6.3%	19.4%	12.1%	4.9%
	30-41	162	55.6%	13%	21%	8%	2.5%
	42-53	147	62.6%	11.6%	17.7%	6.8%	1.4%
	>53	124	75.8%	6.5%	11.3%	4.8%	1.6%
depression	<30	206	24.3%	4.9%	32.5%	26.2%	12.1%
	30-41	162	24.1%	12.3%	27.8%	30.9%	4.9%
	42-53	147	31.3%	12.2%	27.2%	25.9%	3.4%
	>53	124	37.1%	12.9%	30.6%	16.1%	3.2%
compulsion	<30	206	58.3%	9.7%	18.9%	8.7%	4.4%
	30-41	162	63%	8%	18.5%	7.4%	3.1%
	42-53	147	63.3%	5.4%	21.8%	8.2%	1.4%
	>53	124	64.5%	8.9%	21.8%	3.2%	1.6%
somatoform	<30	206	50.5%	25.2%	7.3%	13.1%	3.9%
	30-41	162	56.8%	27.8%	6.8%	7.4%	1.2%
	42-53	147	59.2%	17%	8.8%	12.9%	2%
	>53	124	59.7%	22.6%	8.9%	7.3%	1.6%
eating disorder	<30	206	43.7%	10.2%	25.2%	18%	2.9%
	30-41	162	35.2%	14.8%	26.5%	17.9%	5.6%
	42-53	147	37.4%	12.9%	27.9%	17.7%	4.1%
	>53	124	50.8%	6.5%	31.5%	10.5%	0.8%
ISR total	<30	206	39.3%	7.8%	17%	24.3%	11.7%
	30-41	162	40.7%	4.9%	21%	25.9%	7.4%
	42-53	147	51%	4.1%	13.6%	23.8%	7.5%
	>53	124	55.6%	6.5%	18.5%	15.3%	4%

## MENTAL HEALTH OF HEALTHCARE PROFESSIONALS

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**Table S3***Multiple regression of ISR depression scores on stress factors*

predictor	<i>b</i>	95% CI	<i>t</i> (619)	<i>p</i>
intercept	0.37	[0.12, 0.61]	2.93	.003
changes in work procedures	0.09	[0.02, 0.16]	2.53	.022
protective measures hinder work processes	0.11	[0.03, 0.18]	2.93	.006
protective measures hinder patient contact	0.03	[-0.04, 0.09]	0.77	.649
limited contact to colleagues	0.01	[-0.05, 0.07]	0.35	.879
anxiety about self-infection	0.00	[-0.07, 0.07]	0.07	.940
anxiety about infection of family members	0.15	[0.09, 0.22]	4.65	< .001
job insecurity	0.28	[0.21, 0.36]	7.68	< .001
increasing number of serious illnesses and deaths	-0.01	[-0.07, 0.05]	-0.42	.745

*Note.* *b* = unstandardized regression coefficient; CI = confidence interval;  $R^2 = 0.205$ , adjusted  $R^2 = 0.194$ ,  $F(8,616) = 19.83$ ,  $p < .001$



## MENTAL HEALTH OF HEALTHCARE PROFESSIONALS

4

**Table S4***Multiple regression of ISR anxiety scores on stress factors*

Predictor	<i>b</i>	95% CI	<i>t</i> (619)	<i>p</i>
Intercept	0.24	[0.01, 0.46]	2.08	.038
changes in work procedures	0.01	[-0.05, 0.08]	0.33	.847
protective measures hinder work processes	0.05	[-0.02, 0.11]	1.45	.262
protective measures hinder patient contact	0.00	[-0.06, 0.06]	-0.13	.952
limited contact to colleagues	0.00	[-0.05, 0.06]	0.14	.934
anxiety about self-infection	0.03	[-0.03, 0.10]	1.05	.465
anxiety about infection of family members	0.10	[0.04, 0.16]	3.28	.003
job insecurity	0.17	[0.10, 0.24]	5.01	< .001
increasing number of serious illnesses and deaths	-0.01	[-0.06, 0.04]	-0.41	.847

*Note.* *b* = unstandardized regression coefficient; CI = confidence interval;  $R^2 = 0.097$ , adjusted  $R^2 = 0.085$ ,  $F(8,616) = 8.27$ ,  $p < .001$