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# Development of health care workers' mental health during the SARS-CoV-2 pandemic in Switzerland: two cross-sectional studies

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## Abstract

**Background.** Virus outbreaks such as the current SARS-CoV-2 pandemic are challenging for health care workers (HCWs), affecting their workload and their mental health. Since both, workload and HCW's well-being are related to the quality of care, continuous monitoring of working hours and indicators of mental health in HCWs is of relevance during the current pandemic. The existing investigations, however, have been limited to a single study period. We examined changes in working hours and mental health in Swiss HCWs at the height of the pandemic (T1) and again after its flattening (T2).

**Methods.** We conducted two cross-sectional online studies among Swiss HCWs assessing working hours, depression, anxiety, and burnout. From each study, 812 demographics-matched participants were included into the analysis. Working hours and mental health were compared between the two samples.

**Results.** Compared to prior to the pandemic, the share of participants working less hours was the same in both samples, whereas the share of those working more hours was lower in the T2 sample. The level of depression did not differ between the samples. In the T2 sample, participants reported more anxiety, however, this difference was below the minimal clinically important difference. Levels of burnout were slightly higher in the T2 sample.

**Conclusions.** Two weeks after the health care system started to transition back to normal operations, HCWs' working hours still differed from their regular hours in non-pandemic times. Overall anxiety and depression among HCWs did not change substantially over the course of the current SARS-CoV-2 pandemic.

The SARS-CoV-2 pandemic poses a significant challenge to health care workers (HCWs) all around the globe, affecting their workload and mental health (Ayanian, 2020; Kisely *et al.*, 2020). Since workload and HCWs' well-being are related to the quality of provided care (Scheepers, Boerebach, Arah, Heineman, & Lombarts, 2015), both play a crucial role in sustaining a high work performance of the medical work force during this pandemic. Several studies investigated the mental health of HCWs during the current pandemic but reported partly contradicting findings (e.g. Lai *et al.*, 2020; Rossi *et al.*, 2020; Tian *et al.*, 2020). Moreover, all of these studies were conducted at only one time point.

With this study, we aimed to assess changes in working hours and mental health (assessed as symptoms of anxiety, depression, and burnout) in Swiss HCWs at the height of the SARS-CoV-2 pandemic (T1) and again after its flattening (T2). Since prior research demonstrated none or only modest changes in anxiety and depression among HCWs over the course of previous pandemics (Chen *et al.*, 2006; Chong *et al.*, 2004; Su *et al.*, 2007), we hypothesized that the difference in anxiety and depression between T1 and T2 would be smaller than the minimal clinically important difference. With regard to burnout, no hypothesis was specified.

We conducted two independent, cross-sectional online studies. Inclusion criteria for this analysis were (a) working as a nurse or physician in Switzerland, (b) being at least 18 years old and, (c) having no missing data in the variables of interest. To adjust for the differing characteristics of the two samples, participants were matched one-to-one regarding their age, gender, and profession. Under Swiss federal law, anonymous surveys do not require approval of an

**Table 1.** Demographics, work characteristics, and COVID-19 exposure of two age, gender, and profession matched samples of 812 HCWs each at T1 and T2

Variable	T1 (n = 812)		T2 (n = 812)		Statistic <sup>a</sup>	p
	Median	IQR	Median	IQR		
<b>Demographics</b>						
Age in years	35	30–44	35	30–44	329 291.0	0.968
Women, n (%)	580	71.4	577	71.1	0.012	0.913
Professional experience in years	10	4–20	10	4.25–18	330 553.0	0.892
Nurses, n (%)	342	42.1	358	44.1	0.565	0.452
Physicians, n (%)	470	57.9	454	55.9		
German speaking, n (%)	635	78.2	417	51.4	207.193	<0.001
French speaking, n (%)	88	10.8	334	42.4		
Italian speaking, n (%)	89	10.9	51	6.3		
<b>Work characteristics</b>						
Total working hours in the previous 7 days	45	36–54	44	35–50	362 558.0	<0.001
Total working hours per week prior to the pandemic	45	38–50	42.5	38–50	323 176.0	0.383
Working more during the pandemic than before, n (%)	359	44.2	229	28.2	16.531	<0.001
Working less during the pandemic than before, n (%)	278	34.2	245	30.2	0.670	0.413
Average number of sleep hours in the previous 7 days	7	6–7.5	7	6–7	324 777.5	0.594
Having access to medical equipment	5	3–6	6	4–7	246 276.0	<0.001
Perceived support by employer	6	4–7	6	4–7	319 117.0	0.253
Perceived support by authorities	5	3–6	5	4–6	291 979.5	<0.001
Perceived passage of information by employer	6	4–7	6	5–7	310 493.0	0.037
Perceived passage of information by authorities	5	4–6	6	4–6	317 392.5	0.184
<b>COVID-19 exposure</b>						
Had suspected COVID-19 symptoms or tested positive for SARS-CoV-2, n (%)	122	15.0	149	18.4	2.994	0.084
Was exposed to suspected or confirmed COVID-19 patients at work, n (%)	649	79.9	555	68.4	27.777	<0.001
Frontline worker, n (%)	416	51.2	419	51.6	0.010	0.921
<b>Mental health</b>						
Anxiety	6	3–10	5	2–9	370 831.5	<0.001
Depression	5	2–9	5	2–9	322 760.0	0.463
Burnout	4	2–6	5	2–7	294 374.5	<0.001

IQR = interquartile range; frontline = worked in at clinical unit designated to diagnosis and treatment of patients with suspected or confirmed COVID-19; burnout = burnout overall symptom score; anxiety = GAD-7 overall score; depression = PHQ-9 overall score.

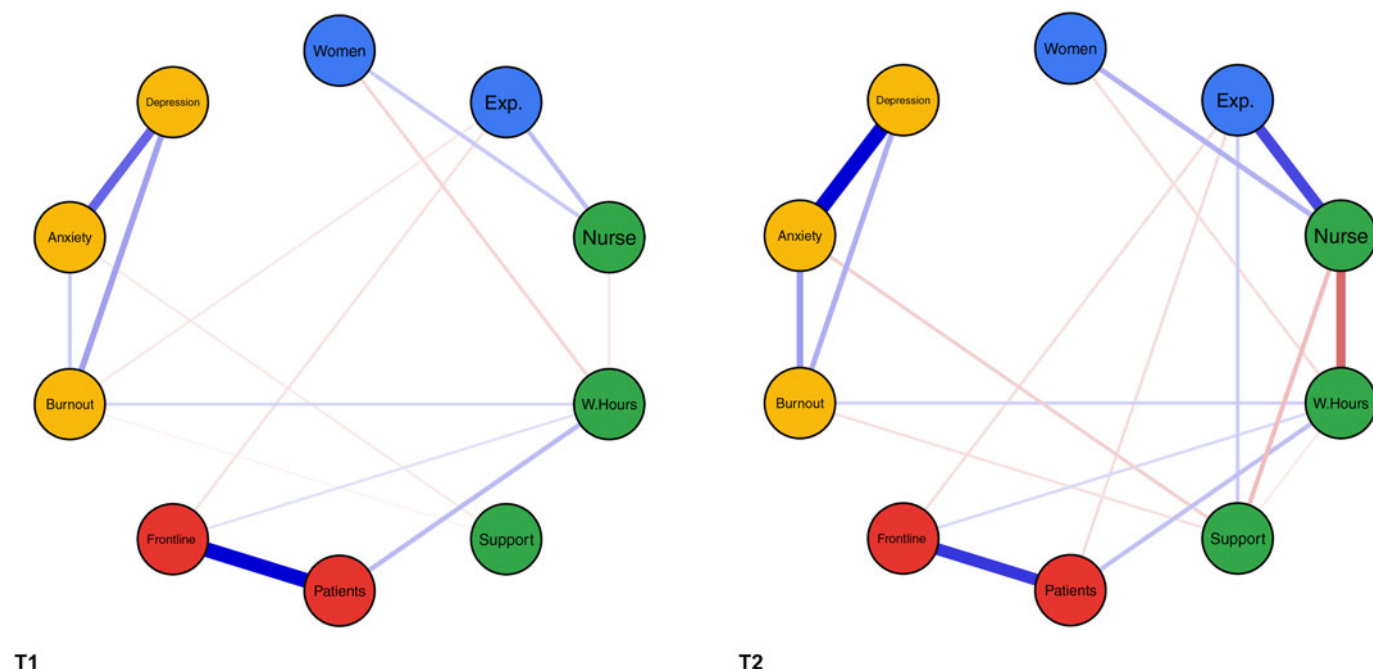
aU or  $\chi^2$ .

institutional review board. Participants were recruited with a snowball technique. Data were collected between 28 March and 4 April 2020 (T1) and between 9 May and 14 May 2020 (T2).

Symptoms of anxiety and depression were measured with the *Generalized Anxiety Disorder 7* (GAD-7; Spitzer, Kroenke, Williams, and Löwe, 2006) and the *Patient Health Questionnaire-9* (PHQ-9; Kroenke, Spitzer, and Williams, 2001), respectively. The minimal clinically important difference was defined as four points for the GAD-7 (Toussaint et al., 2020) and as five points for the PHQ-9 (Löwe, Unützer, Callahan, Perkins, & Kroenke, 2004). Two single items derived from the *Maslach Burnout Inventory* (West, Dyrbye, Sloan, & Shanafelt, 2009) were used to assess burnout. The period of reference for all questions was the past 7 days.

Sample characteristics and median levels of symptoms were compared using  $\chi^2$  and Mann–Whitney *U* tests and carried out in JASP version 0.12 (JASP Team, 2020). Associations between multiple variables were investigated using network analytic methods (Epskamp, Borsboom, & Fried, 2018). These analyses were conducted in the R statistical environment. The chosen significance level for all tests was  $\alpha = 0.05$ .

The demographics and the differences in anxiety, depression, and burnout of both samples are outlined in Table 1. The share of participants working fewer hours than prior to the pandemic did not differ between T1 and T2 ( $\chi^2 = 0.670$ ,  $p = 0.413$ ), however, less participants in the T2 sample were working longer hours than prior to the pandemic ( $\chi^2 = 16.531$ ,  $p \leq 0.001$ ). Anxiety of participants of the first study was higher than among participants of the



**Fig. 1.** Relationships between multiple variables for two matched samples of 812 HCWs each at T1 and T2. *Note.* Nodes represent variables. The coloring of the nodes indicates different groups of variables (demographics, workplace-related factors, exposure to COVID-19, and mental health); edges represent associations between the nodes (continuous/green=positive, dashed/red=negative, thickness=magnitude of the relationship); women=gender (levels: men=1, women=2); Exp.=professional experience in years; nurse=nursing staff (variable=*Profession*; levels: physician=1, nurse=2); W.Hours=total working hours in the previous 7 days; support=perceived support by employer; patients=exposure to suspected or confirmed COVID-19 patients at work (levels: No=0, Yes=1); ward=working in clinical unit designated to diagnosis and treatment of patients with suspected or confirmed COVID-19 (levels: No=0, Yes=1); burnout=overall burnout symptom score; anxiety=overall GAD-7 score; depression=overall PHQ-9 score.

second study ( $U = 370\,831.5$ ,  $p \leq 0.001$ ,  $r = 0.125$ ). Both samples had equal symptoms of depression ( $U = 322\,760.0$ ,  $p = 0.463$ ). Participants in the second study reported more burnout than participants in the first sample ( $U = 294\,332.5$ ,  $p \leq 0.001$ ,  $r = -0.107$ ). The results of the network analyses are presented in Fig. 1.

Two weeks after the Swiss health care systems started to transition back to normal operations, roughly 30% were working more and 30% were working less hours compared to their usual hours in non-pandemic times. This underscores the complex impact of the pandemic and the taken measures on HCWs' working hours. The increase in anxiety is in concordance with three studies conducted during earlier pandemics, whereas the nondifference in depressive symptoms contrasts them (Chen et al., 2006; Chong et al., 2004; Su et al., 2007). However, the differences in our study did not reach the minimal clinically relevant difference. In the case of burnout, it was of small magnitude. In the conducted network analyses burnout and anxiety were both independently related to lower perceived support by the employer in both studies, a well-described association also in non-pandemic contexts (Shanafelt & Noseworthy, 2017). The nontargeted recruitment, the non-representativeness of our sample, the adaptation of the questionnaires to cover the last 7 days, and the lack of data collected prior to the pandemic limit our study.

Taken together, our findings indicate that the course of the SARS-CoV-2 pandemic did not substantially impact the mental health of Swiss HCWs. In addition, they emphasize the employers influence on HCWs' mental health also during this ongoing pandemic.

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**Conflict of interest.** We have no conflict of interest to declare.

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