PTSD symptoms after the initial phase of the pandemic: A three-month follow-up of
vulnerable professionals

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Abstract

The COVID-19 pandemic has consequences for mental health in the general population and for health care personnel in particular. This study aimed to investigate the changes in PTSD symptoms, anxiety, and depression when the social distancing protocols were lifted (T2) following a period with strict protocols (T1). At T1, 1773 vulnerable professionals provided answers to the questionnaire, and at T2, 878 responded once again (49.5%). The data were analyzed using multilevel modeling with maximum likelihood to estimate missing data.

PTSD symptoms, anxiety, and depression decreased from T1 to T2. There were no significant predictors of change of PTSD from T1, but a change in strategies and burnout was associated with a change in PTSD symptoms. There was no difference in those who worked directly versus indirectly with COVID-19 patients in PTSD-symptoms at follow-up.

The results indicate that health care workers and public service providers have had a notable reduction in PTSD symptoms, anxiety, and depression from the initial phase of the pandemic to the three-month follow-up, where the social distancing measures were greatly lightened. The results suggest that the high levels of PTSD symptoms, anxiety, and depression among vulnerable professionals in the first phase of the pandemic may be temporary.

Keywords: COVID-19; PTSD; Health care workers; Anxiety; Predictor

1. Introduction

The COVID-19 pandemic has affected the mental health of the general population (Brooks et al., 2020; Ebrahimi, Hoffart, & Johnson, 2021; Salari et al., 2020), as well as of those who work in the front line of the pandemic (Benfante, Di Tella, Romeo, & Castelli, 2020; Johnson, Ebrahimi, & Hoffart, 2020).

Health care workers and public service providers, so-called vulnerable professionals, involved in the COVID-19 pandemic have multiple sources of distress such as a high degree of responsibility, a high degree of work-load, concern about the spread of the virus, and worry about job and economy (Lai et al., 2020). Furthermore, vulnerable professionals are at risk for so-called moral injury, distress derived from actions that violate their personal ethical and moral codes (Williamson, Murphy, & Greenberg, 2020). PTSD may develop as a consequence of threatening and horrifying events (Friedman, Keane, & Resick, 2007). In sum, all these factors may contribute to the development of mental illnesses, and in particular, PTSD.

The prevalence of posttraumatic stress disorder (PTSD) symptoms in the general population during the COVID-19 pandemic varies across studies and contexts from 7%–54% (Xiong et al., 2020), with a pooled estimate of 24% (Cooke, Eirich, Racine, & Madigan, 2020). In a recent Norwegian study, the prevalence of PTSD based on self-reports of symptoms was 12.5 % for men and 19.5% for women during the early phase of the pandemic (Bonsaksen et al., 2020). PTSD symptoms among health care workers and public service providers vary from 7.4% to 35% (Benfante et al., 2020). In our previous study (Johnson et al., 2020), 11.7 % of the vulnerable professionals scored above cut-off on PTSD symptoms. As shown in a recent meta-analysis (Allan et al., 2020), there is evidence that healthcare workers in pandemics are at increased risk of an adverse mental outcome, but few studies have investigated the long-term effects of stress and trauma.

Predictors of PTSD have been studied extensively (Brewin, Andrews, & Valentine, 2000; DiGangi et al., 2013; Heron-Delaney, Kenardy, Charlton, & Matsuoka, 2013; Tolin & Foa, 2006). The current study assessed sociodemographic factors, anxiety and depression, emotional support, worry, burnout, interpersonal problems, and positive and negative metacognitive beliefs.

Sociodemographic factors such as younger age and female gender have been found in reviews to be associated with higher symptoms of PTSD (Serrano-Ripoll et al., 2020).

A systematic review and meta-analysis of the prevalence of anxiety and depression among health care workers, mainly in China, showed a prevalence of anxiety and depression above 20% and that females and nurses have higher rates of symptoms (Pappa et al., 2020). Burnout is found to be predictive of PTSD-symptoms (Kim et al., 2019), as well as emotional support (Brewin et al., 2000).

These predictors were chosen because they are widely studied and also because some of the variables, such as worry, negative and positive metacognitive beliefs (Wells, 2009), and interpersonal problems (Markowitz, Milrod, Bleiberg, & Marshall, 2009), may be mechanisms but also targets for treatment. Positive metacognitive beliefs concern the usefulness of worry, rumination, and threat monitoring (i.e., “If I ruminate, I will find an answer). Negative metacognitive beliefs concern uncontrollability of thoughts and perceived danger (i.e., “My thoughts are dangerous,” (Wells, 2009).

In our previous study of vulnerable professionals (Johnson et al., 2020), more than 20% of the participants had anxiety and depression symptoms, and 11.7% fulfilled the criteria for PTSD. In this first period of the pandemic (15.3–15.4.2020), 793 persons were admitted to Hospitals in Norway due to COVID-19 infections (Helsedirektoratet, 2020). However, since the outbreak of coronavirus in Norway during the spring of 2020, the national social distancing measures were reduced. There were fewer COVID-19 infections during the

summer, fewer cases at the hospital, and only 30 new cases admitted from 15 June to 15 July. Thus, the first period, called T1, was during an intense phase of the pandemic, while the second period, called T2, was at a less intense phase.

The current paper, therefore, aimed to investigate the level of PTSD symptoms at T2, three months following the most critical isolation-period (i.e., a period with strictly implemented national social distancing measures), examine the level of anxiety, depression, and PTSD in demographic subgroups at T2, examine changes in PTSD symptoms from T1 to T2, and investigate predictors that were relevant as treatment targets.

The following two hypotheses were formulated and pre-registered before data-collection.

H1: There will be a significant decrease in PTSD symptoms, anxiety, and depression from T1 to T2.

H2: A higher level at T1 and less reduction from T1 to T2 in metacognition, strategies, burnout, worry about job and economy, interpersonal problems will be associated with less reduction in PTSD symptom from T1 to T2, above and beyond the influence of direct vs. indirect exposure to trauma and demographic variables (i.e., age, gender, living with a partner, living with children).

2. Method

2.1 Study design and recruitment procedure

The study has a longitudinal design with two time points. The respondents are the same as those investigated in March 2020. Health personnel and public service providers were systematically targeted through various channels, further described in (Johnson et al., 2020).

First, a selection of those qualifying as healthcare workers and public service providers were randomly targeted on Facebook by a Facebook Business algorithm. Second, all hospitals in Norway were reached out to systematically, and health personnel were invited to participate. Third, the unions (e.g., medical association and nursing association) of all major health worker groups were contacted. Moreover, national TV, national, regional, and local radio stations, and national, regional, and local newspapers were used. Politicians were further systematically contacted, with all political parties sending an e-mail with the survey to their members. Participants were asked to fill out a set of validated questionnaires including demographic variables, psychological symptoms, including depression, anxiety, and PTSD.

The first period of data collection lasted seven days and was undertaken between March 31, 2020, and April 7, 2020 (T1, N=1773), which encompasses a timeframe where all non-pharmacological interventions (NPIs) were held constant during the two weeks before data collection, as well as during the data collection week. NPIs represent an umbrella term for social distancing protocols and hygienic control measures actualized through individuals and communities that aids in slowing the spread of pandemics, such as the COVID-19. No novel information was given from the government about possible changes in any epidemic protocols during the data-collection, keeping expectation effects constant. The second data collection phase lasted from June 22 until July 13 (T2, N=878), one week after the majority of the protocols for distancing and social contact were lifted. An overview of the different NPIs at the two time-points are given in supplementary table.

Approval from the Regional Committee for Medical Research Ethics was received before the commencement of the study (reference number: 125510). Participants were allowed to terminate the survey at any time without any consequences. The study was pre-registered at ClinicalTrials.gov before data collection (Identifier: NCT04442243).

The current study is part of the Norwegian COVID-19, Mental Health and Adherence project.

2.2 Participants

Individuals eligible for participation were persons > 18 years of age who have provided their consent to participate in the survey and were health workers or public service providers working directly or indirectly with COVID-19 patients. At T1, 1773 participated; at T2, 878 participated, of which 629 reported PTSD symptoms. This indicates that 249 participants changed their occupation since T1 and did not classify themselves as vulnerable professionals at T2.

2.3 Measures

The following measures were used in the current study, and Cronbach's alpha (α) is reported from T2:

PTSD checklist for DSM-5 (PCL-5) was used to measure PTSD symptoms (0–80), $\alpha=0.96$ (Bovin et al., 2016). The participants were asked about the most distressing event from the COVID-19 period. Participants indicating scores of 2 or above, scale from 0–4, on at least one of five re-experiencing symptoms, one of two avoidance symptoms, two of seven symptoms of negative alterations in cognition and mood, and two of six arousal symptoms were classified as fulfilling the PTSD symptom criteria (maximum of 6) (Bovin et al., 2016). Subclinical PTSD was defined as those who had at least four criteria fulfilled, with a diagnostic score in at least two symptom clusters of PTSD. This accords with the recommendation in the literature of two to three DSM-5 criteria in symptom clusters fulfilled (McLaughlin et al., 2015).

General Anxiety Disorder-7 (GAD-7) was used to measure anxiety (0–21), $\alpha = 0.89$ (Spitzer, Kroenke, Williams, & Löwe, 2006), and *Patient Health Questionnaire-9 (PHQ-9)* for depression (0–27), $\alpha = 0.90$ (Kroenke K, Spitzer R.L, & Williams J.B, 2001). For GAD-7, the scores were classified as normal (0–4), mild (5–7), moderate (8–14), and severe (15–21). For the PHQ–9 scores; normal (0–4), mild (5–9), moderate (10–14) and moderately severe (15–19), and severe (20–27). These cut-offs have been well established in the literature (Johnson, Ulvenes, Øktedalen, & Hoffart, 2019; Kroenke K et al., 2001; Spitzer et al., 2006).

The *Cognitive Attentional Syndrome Scale-1 (CAS-1)* (Nordahl & Wells, 2019) consists of three subscales: *strategies* (8 items, $\alpha = 0.91$, *positive metacognition* (4 items, $\alpha = 0.62$), and *negative metacognition* (4 items, $\alpha = 0.69$).

Seventeen items from the *Inventory of Interpersonal Problems (IIP)* (Horowitz, Alden, Wiggins, & Pincus, 2000) were combined into the scale interpersonal problems, $\alpha = 0.81$. Given the length of the full IIP scale encompassing as many as 64 items, with many items overlapping, unique items relevant for the present context were chosen through a consensus procedure by three clinical experts. Furthermore, two items were combined to represent worries about *work and the economy*. *Burnout* was measured through a single item: “I feel burned out.”

The *Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS)*, encompassing seven items, was used to measure well-being, $\alpha = 0.87$ (school, 2020). Previous studies have used 19 as the cut-off indicating low mental well-being; thus, this was used as the cut-off in the current study. The SWEMWBS was only measured at T2.

The Life Event Checklist for DMS-5 (LEC-5) (Weathers et al., 2013) is a self-report measure designed to screen for potentially traumatic events in a respondent’s lifetime. Five items from the scale were chosen: life-threatening illness or injury, severe human suffering, sudden accidental death, sudden violent death, or any other very stressful event or

experience. All the questions were rated in six categories, with the rating 1 =Happened to me, 2=Witnessed it, 3= Learned about it, 4 = Part of my job, 5 = Not sure, 6 = Doesn't apply.

The demographic data assessed were gender (male, female, transgender, and intersex), type of occupation (doctors, nurses, clinical psychologists, social workers, politicians, and other health workers), age (18–24, 25–44, 45–59, >60), marital status, living with children, education level, and working directly or indirectly with COVID-19 patients at T2. Directly is defined as face-to-face contact with patients who have tested positive for COVID-19. Indirectly is defined as working with other consequences of the COVID-19 pandemic, but not face-to-face with patients infected by the coronavirus.

2.4 Statistical methods

The data of PTSD symptoms, anxiety, and depression were highly right-skewed; thus, median and interquartile range (IQR) were reported, and a Kruskal-Wallis test and Mann-Whitney U-tests were performed to compare the different groups at T2. The variable well-being was not skewed; hence t-tests and one-way Anova with Bonferroni correction were used. Effect sizes of the change from T1 to T2 were calculated based on Cohen's *d* (Cohen, 1988). Repeated surveys typically have a lot of dropout and missing data. Therefore, we used mixed models instead of paired t-tests, repeated-measures ANOVAs, and ordinary linear regression to analyze the data over the two time points. Mixed models use maximum likelihood estimation, which is the state-of-the-art approach for handling missing data (Schafer & Graham, 2002). Especially if data are missing at random, which is likely in our survey, mixed models provide less biased results than the other analytic methods (O'Connell et al., 2017).

In preliminary analyses, and for each of the dependent variables (PCL-5, GAD-7, and PHQ-9), the combination of random effects and covariance structure of residuals that gave

the best fit for the “empty” model (the model without fixed predictors except the intercept) was chosen. Akaike’s Information Criterion (AIC) was used to compare the fit of different models. Models that give a reduction in AIC greater than 2 will be considered better (Burnham & Anderson, 2004).

First, decrease in PCL-5, GAD-7, and PHQ-9 was tested using PTSD symptoms, anxiety, or depression as dependent variable in a model using time (T1 period = 0, T2 period = 1) as a predictor. Second, demographic group variables were added as predictors for PTSD symptoms. Third, the initial (T1) levels of metacognition, strategies, burnout, worry about job and economy, and interpersonal problems were added, together with these constant covariates' interactions with time. These interactions represent tests of the covariates predicting change in PTSD symptoms. Finally, the T2 levels of metacognition, strategies, burnout, worry about job and economy, interpersonal problems as constant covariates will be added, together with the interactions of these constant covariates with time. These interactions represent tests of H2 about the change in the covariates from T1 to T2, predicting change in PTSD symptoms from T1 to T2s. Given the large sample size in this study, we predefined the significance level to $p < 0.01$. The program SPSS 26.0 was used for the analysis (IBM, 2019).

3. Results

3.1 Demographic Characteristics

There were 878 participants at T2. It is common among health care workers and public service providers that these are mainly women (84.5%), which was also the case in the current study with 86% women. The current sample match was reasonable with the general population of health care personnel based on Norwegian data (Statistisk sentralbyrå, 2020). However, the sample at T2 was somewhat younger. 53.1% below 39 years of age compared

to official statistics 41.5% below 39 years of age. A Mann-Whitney U test showed significant difference between those replied on the survey at T2 in contrast to those who did not reply on PTSD symptoms, $U (N_{\text{nonreply}} = 895, N_{\text{reply}} = 878) = 363401, z = -2.74, p = 0.006$, depression symptoms, $U (N_{\text{nonreply}} = 895, N_{\text{reply}} = 878) = 357528, z = -3.29, p = 0.001$, but not on anxiety symptoms, $U (N_{\text{nonreply}} = 895, N_{\text{reply}} = 878) = 375808, z = -1.59, p = 0.111$. Sample characteristics at T2 are reported in Table 1. Descriptives for PTSD symptoms, anxiety, depression, and well-being at T2 are shown in Table 3.

3.2 Level of PTSD symptoms, anxiety, and depression at T2

Of the 629 respondents reporting PTSD symptoms, 55.5% had experienced life-threatening illness or injury, 71.4 % severe human suffering, 25.4% sudden accidental death, 35.8% sudden violent death, and 61.2% other stressful experiences during their lifetime. As shown in Table 2, 19.8% of the sample had a clinical or subclinical level of PTSD symptoms, and 16.9% reported above cut-off for depression and 15.0% reported above cut-off for anxiety at T2. We also compared the level between working position\ groups: A Mann-Whitney U test showed no significant difference between those working directly in contrast to those working indirectly with COVID-19 patients at T2 on PTSD symptoms, $U (N_{\text{direct}} = 131, N_{\text{indirect}} = 498) = 29878, z = -1.49, p = 0.14$, anxiety symptoms, $U (N_{\text{direct}} = 131, N_{\text{indirect}} = 498) = 30910, z = -0.93, p = 0.35$, or depressive symptoms, $U (N_{\text{direct}} = 131, N_{\text{indirect}} = 498) = 31005, z = -0.87, p = 0.38$. Also, there were no significant differences in the level of well-being, as shown in Table 3, using an independent sample t-test, $t (627) = -0.83, p = 0.71$.

Investigating the different occupational groups on PTSD symptoms, anxiety, and depression, we used a Kruskal Wallis test. There were significant differences on PTSD symptoms $\chi^2 (6) = 54.7, p < 0.001$, anxiety $\chi^2 (6) = 38.2, p < 0.001$, and depression $\chi^2 (6) =$

56.5, $p < 0.001$. However, the differences between the groups were small and mainly due to low scores from the clinical psychologists and the medical doctors, which were the lowest across the three measures. For mental well-being, there was a significant difference between the groups $F(6, 871) = 5.78, p < 0.01$. Post hoc comparisons using Bonferroni correction indicated that medical doctors and clinical psychologists had higher well-being scores than the other groups. However, as shown in Table 3, the differences in mean values are rather small.

3.3. Change in PTSD symptoms, anxiety and depression from T1 to T2

There was a significant reduction in PTSD symptoms, $estimate = -2.25, SE = 0.44, t(820.4) = -5.16, p < 0.001$, anxiety $estimate = -0.98, SE = 0.10, t(1013.7) = -9.21, p < 0.001$ and depression, $estimate = -0.66, SE = 0.13, t(1036.7) = -5.28, p < 0.001$ from T1 to T2. The effect sizes were small, however, $d = 0.21$ for PTSD-symptoms, $d = 0.26$ for anxiety, and $d = 0.18$ for depression.

3.4 Demographic predictors of PTSD symptoms

We first investigated whether age, gender, living with a partner, living with children, and working directly or indirectly with COVID-19 patients at T1 predicted change in PTSD symptoms. The interactions were not significant: age x time; $estimate = -0.04, SE = 0.4, t(825.9) = -0.98, p = 0.33$, gender x time; $estimate = -0.12, SE = 1.23, t(826.3) = -0.10, p = 0.92$, living with a partner X time; $estimate = -0.37, SE = 0.94, t(830.8) = -0.39, p = 0.69$, living with children x time; $estimate = 0.82, SE = 0.89, t(817.4) = 0.92, p = 0.36$, working directly with COVID-19 patients at T1; $estimate = -0.78, SE = 1.09, t(805.1) = -0.71, p = 0.48$. However, as stated in the preregistered analyses, all the demographic variables were kept in the subsequent analysis.

3.5 Psychological predictors from T1 and T2

As shown in Model 1, Table 4, there were no significant predictors at T1; that is, there were no significant interactions of the predictors with time. As shown in model 2, the interactions of burnout and strategies at T2 with time were significant, indicating that change in burnout and change in strategies were associated with change in PTSD symptoms.

4. Discussion

The proportion of respondents reporting clinical and subclinical PTSD symptoms was reduced from 28.9% at T1 to 19.8% at T2. T1 was during an intense phase of the pandemic, while T2 was at a period when the number of patients in hospitals was low, and the social distancing protocols were reduced. At T1, 11.7% of the sample were above the clinical cut-off on PTSD. At T2, the same figure was 7.9%. Thus, there has been a notable reduction in PTSD symptoms. The difference found between those working directly vs indirectly with COVID-19 patients at T1 were no longer present at T2. This gives theoretically meaning since the pressure on the health care system and society were lower at T2, and it also indicates that those experiencing most stress during the intense phase of the pandemic may return to average levels of distress.

The proportion reporting clinically significant levels of anxiety and depression were also reduced from 21.2% to 16.9% for depression, and from 20.5% to 15.0% for anxiety (Johnson et al. 2020). Thus, entering a less intense phase of the pandemic positively affected health care workers' and vulnerable professionals' mental health. The levels of PTSD at T2 are in the lower range of what is reported in a recent meta-analysis of traumatic stress in health care workers during the COVID-19 pandemic (Benfante et al., 2020). Importantly, this study shows a reduction in symptoms compared to the levels of PTSD, anxiety, and

depression in the early phase of the pandemic, filling a gap in the literature with the use of longitudinal analysis (Allan et al., 2020).

However, a considerable number of persons still report clinical or subclinical PTSD symptoms and symptoms of anxiety and depression. There is a lot of variability in the estimates of PTSD symptoms, anxiety, and depression (Xiong et al., 2020); hence, further longitudinal studies are needed to investigate the different trajectories. Medical doctors and clinical psychologists had the lowest levels of anxiety, depression, and PTSD symptoms. However, the overall differences were small between the different occupational groups.

The predictors of metacognition, strategies, burnout, worry about job and economy, and interpersonal problems at T1 were surprisingly not associated with change in PTSD symptoms. Burnout and strategies in the form of worry/rumination and specific coping strategies were significant predictors at T2, indicating that change in these variables was associated with change in PTSD symptoms. Thus, burnout may intensify PTSD symptoms, and PTSD symptoms are energy-draining and may thus strengthen burnout. Furthermore, specific strategies for regulating emotion may interact with PTSD symptoms. Further studies with more time points are needed to investigate how these variables interact over time.

The level of well-being among the vulnerable professionals at T2 was at a reasonably high level. Studies conducted of 1679 Norwegian adolescents had a mean result of well-being at 24.9, measured by the SWEMWBS scale (Ringdal, Bradley Eilertsen, Bjørnsen, Espnes, & Moksnes, 2017), and the current sample had 26.7. Thus, the level of well-being in the current sample at T2 was generally high. Regarding the cut-off on 19, only 5.7% of the group of vulnerable professionals were below this cut-off. Thus, despite high levels of anxiety and depression, the level of well-being is high among vulnerable professionals. Hence, their well-being may be less affected among vulnerable professionals compared to anxiety and depression, possibly because of the importance of their work giving meaning and purpose.

4.1 Strengths and limitations

Strengths of this study include the longitudinal design as well as an analytic strategy that handles missing data. Furthermore, the level of well-being was assessed, which included other types of measures in combination with the assessment of anxiety, depression, and PTSD symptoms. Limitations include that some variables were measured by only one item (burnout), making it prone to measurement error. In the current study, the participants were not asked about “traumatic” events from the COVID-19 period. We did assess some of the items that are part of the assessment of the A-criterion of PTSD: however, the percentages of the participants who had experienced a lifetime serious event were less than what is reported in a national survey in Norway in which 86% reported a serious event (Heir et al., 2019). Thus, the high levels of PTSD symptoms in this sample at T1 could probably not be attributed to a high degree of trauma outside the COVID-19 pandemic. The respondents at T2 were somewhat less distressed than those who did not fill out the questionnaire, thus it is unlikely that the current sample has overreported the symptoms. The diagnostic status of PTSD should be investigated using clinical interviews of health care personnel during the COVID-19 pandemic to get a true estimate of the PTSD-prevalence.

4.2 Conclusion

Health care workers and public service providers had reductions in PTSD symptoms, anxiety, and depression from the first phase of the pandemic and to a three-month follow-up when the social distancing measures were lifted, and the number of patients in the hospital was low. The results suggest that the high levels of PTSD symptoms and anxiety and depressive symptoms in the first phase of the pandemic may be temporary, and the mental

health of these crucially important workgroups will improve following the termination of the COVID-19 pandemic.

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Table 1*Demographics and Characteristics of the Sample at T2*

Variable	T2 (N=878)
Gender	Frequency (percentages)
Male	123 (14)
Female	754 (86)
Intersex/transgender	1 (0)
Age	
18-24	55 (6.3)
25-44	522 (59.5)
45-59	241 (27.4)
>60	60 (6.8)
Presence of psychological disorder	
No	755 (86)
Yes	123 (14)
Higher education	
No	62 (7)
University	816 (93)
Married /Civil union	
Yes	622 (70.8)
No	256 (29.2)
Children	
Yes	512 (58.3)
No	366 (41.7)

Note: Percentages in parenthesis.

Table 2*Cut off scores on PTSD symptoms, Anxiety and Depression at T2*

Scale	Total sample	Working position	
Severity category		Direct (N=131)	Indirect (N=498)
PTSD symptoms			
Nonclinical	504 (80.1)	109 (83.2)	395 (79.3)
Subclinical	75 (11.9)	10 (7.6)	65 (13.1)
PTSD	50 (7.9)	12 (9.2)	38 (7.6)
PHQ-9			
Normal	473 (53.9)	67 (51.1)	272 (54.6)
Mild	256 (29.2)	41 (31.3)	147 (29.5)
Moderate	81 (9.2)	13 (9.9)	43 (8.6)
Moderate severe	52 (5.9)	7 (5.3)	26 (5.2)
Severe	16 (1.8)	3 (2.3)	10 (2.0)
GAD-7			
Normal	572 (65.1)	81 (61.8)	337 (67.7)
Mild	174 (19.8)	27 (20.6)	97 (19.5)
Moderate	111 (12.6)	18 (13.7)	54 (10.8)
Severe	21 (2.4)	5 (3.8)	10 (2.0)

Note: Diagnostic criterion for PTSD was based on DSM-5. Percentages given in parenthesis. Sample size for PTSD and working position is 629. Sample size for anxiety and depression N=878.

Table 3*Posttraumatic symptoms, Anxiety, Depression and Well-being in subgroups at T2*

Sample	PCL-5 Median (IQR)	GAD-7 Median (IQR)	PHQ-9 Median (IQR)	Well-being Mean (SD)
Total sample (878)	5 (0-14)	3 (1-6)	4 (2-8)	26.7 (4.3)
Direct Covid-19 (N=131)	6 (1-14)	3 (1-6)	4 (2-8)	27.1 (4.3)
Indirect Covid-19 (N=498)	4 (0-14)	3 (1-6)	4 (2-7)	26.8 (4.2)
Medical doctors (N=100)	4 (0-10)	1 (0-3)	2 (1-5)	28.1 (4.2)
Nurses (N=344)	6 (2-18)	3 (1-7)	5 (2-9)	26.5 (4.3)
Clinical Psychologists (N=131)	0 (0-5)	2 (1-4)	3 (1-5)	27.5 (3.5)
Social workers (N=88)	6 (0-17)	4 (1-8)	6 (3-10)	25.3 (4.7)
Politicians (N=24)	13 (0-36)	3 (1-7)	4 (1-10)	24.8 (3.8)
Other health workers (N=43)	9 (4-20)	4 (1-8)	5 (2-9)	25.9 (5.1)
Other (N=148)	5 (1-15)	3 (1-6)	4 (2-7)	27.2 (3.9)

Note: “Other” included health personnel working in other sectors or public service providers not working as social workers. Sample size between those with anxiety and depression and PTSD symptoms vary, with a smaller sample size on PTSD total sample (N=629), Medical doctors (N=94), Nurses (N=256), Clinical psychologist (N=99), Social workers (N=61), Politicians (N=14), Other health workers (N=30) and Other (N=75), direct Covid-19 (N=131) and indirect COVID-19 (N=498).

Table 4*Predictors for PTSD symptoms identified by MLM-analysis*

	Estimate	SE	T	Estimate	SE	T
	Model 1			Model 2		
Intercept	-8.51	2.80	-3.0*	-10.44	3.51	2.96*
Time	1.90	2.15	0.9	1.23	2.28	0.54
Age	0.18	0.05	3.8*	0.19	0.06	3.39*
Gender	-1.17	1.6	-0.8	-2.97	1.88	-1.57
Relationship	0.95	1.2	0.8	2.28	1.51	1.51
Living with children	-3.11	1.21	-2.6*	-2.74	1.43	-1.92
Direct vs indirect	3.77	1.43	2.6*	4.04	1.78	2.27
MCQneg_t1	0.03	0.01	3.4*	0.03	0.01	2.51
MCQpos_t1	-0.00	0.01	-0.6	0.01	0.01	0.61
Strategies_t1	0.56	0.07	8.1*	0.73	0.09	7.88*
Burnout_t1	3.47	0.68	5.0*	3.83	0.91	4.20*
Worry job/econo_t1	1.35	0.44	3.1*	1.97	0.64	3.09*
IIPTot_t1	0.09	0.07	1.3	0.14	0.13	1.10
Age X Time	-0.06	0.04	-1.73	-0.04	0.04	-1.09
Gender X Time	-0.35	0.04	-0.30	1.02	1.21	0.84
Relationship X Time	-1.06	0.93	-1.14	-1.26	0.97	-1.30
Living with children X Time	1.37	0.89	1.54	1.42	0.92	1.53
Direct vs indirect X Time	-1.11	1.05	-1.07	-1.22	1.10	-1.11
MCQneg_t1 X Time	-0.01	0.01	-0.74	-0.01	0.01	1.54
MCQpos_t1 X Time	0.01	0.01	0.89	-0.00	0.01	-0.43
Strategies_t1 X Time	-1.00	0.05	-1.85	-0.30	0.06	-4.99*
Burnout_t1 X Time	-0.73	0.52	-1.40	-1.48	0.59	-2.51
Worry j/e_t1 X Time	-0.21	0.34	-0.63	-0.86	0.42	-2.06
IIPTot_t1 X Time	0.04	0.05	0.72	-0.13	0.08	-1.64
MCQneg_t2				-0.02	0.01	-1.14
MCQpos_t2				-0.01	0.01	-0.80
Strategies_t2				-0.19	0.10	-1.86
Burnout_t2				-1.65	0.95	-1.73
Worry job/econo_t2				-0.68	0.81	-0.84
IIPTot_t2				-0.00	0.04	0.03
MCQneg_t2 x Time				0.02	0.01	2.07
MCQpos_t2 X Time				0.00	0.01	0.56
Strategies_t2 X Time				0.28	0.07	4.18*
Burnout_t2 X Time				2.01	0.62	3.25*
Worry j/e_t2 X Time				1.12	0.54	2.08
IIPTot_t2 X Time				0.10	0.08	1.24

Note: * $p < 0.01$, Worry j/e= Worries about job and economy, IIPtot.= Interpersonal problems, MCQpos= Positive metacognitions, MCQneg= Negative metacognitions.