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Longitudinal Impact of the COVID-19 Pandemic on Stress and Occupational Well-Being of Mental Health Professionals: An International Study

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Abstract

Background: Increased levels of occupational stress among health professionals during the COVID-19 pandemic have been documented. Few studies have examined the effects of the pandemic on mental health professionals despite the heightened demand for their services.

Method: A multilingual, longitudinal, global survey was conducted at 3 time points during the pandemic among members of the World Health Organization's Global Clinical Practice Network. A total of 786 Global Clinical Practice Network members from 86 countries responded to surveys assessing occupational distress, well-being, and posttraumatic stress symptoms.

Results: On average, respondents' well-being deteriorated across time while their posttraumatic stress symptoms showed a modest improvement. Linear growth models indicated that being female, being younger, providing face-to-face health services to patients with COVID-19, having been a target of COVID-related violence, and living in a low- or middle-income country or a country with a higher COVID-19 death rate conveyed greater risk for poor well-being and higher level of stress symptoms over time. Growth mixed modeling identified trajectories of occupational well-being and stress symptoms. Most mental health professions demonstrated no impact to well-being; maintained moderate, nonclinical levels of stress symptoms; or showed improvements after an initial period of difficulty. However, some participant groups exhibited deteriorating well-being approaching the clinical threshold (25.8%) and persistently high and clinically significant levels of posttraumatic stress symptoms (19.6%) over time.

Conclusions: This study indicates that although most mental health professionals exhibited stable, positive well-being and low stress symptoms during the pandemic, a substantial minority of an already burdened global mental health workforce experienced persistently poor or deteriorating psychological status over the course of the pandemic.

Keywords: COVID-19, mental health workforce, occupational well-being, posttraumatic stress symptoms, longitudinal design

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Significance Statement

The study is a longitudinal analysis of the well-being and stress response of psychiatrists and other mental health professionals across all WHO regions. The results confirm previous cross-sectional research that finds that most mental health professionals experienced good outcomes during the pandemic. However, it also reveals that there is a significant risk to a large minority of professionals. Younger, female professionals, those living in low- or middle-income country or a country with a higher COVID-19 death rate, those providing face-to-face health services to patients with COVID-19, and those having been a target of COVID-related violence, were at greater risk for poorer well-being and higher levels of stress symptoms over time. The results highlight the importance of identifying mental health professionals at risk during major disruptions to health systems and provide them with intervention programs that are accessible to protect the capacity of the global mental health workforce.

INTRODUCTION

The COVID-19 pandemic had devastating public health consequences, including to mental health (Adhanom Ghebreyesus, 2020; Assefa et al., 2022). During the early stages, some of the most direct and brutal effects of COVID-19 were experienced by health professionals responsible for providing care to individuals infected by this deadly virus (Du et al., 2020; Nguyen et al., 2020; Ferland et al., 2022). Several studies (Holmes et al., 2020) demonstrated adverse mental health consequences of the COVID-19 pandemic for health professionals (Lai et al., 2020; Liu et al., 2020; Lu et al., 2020; Mediavilla et al., 2021, 2022; Aymerich et al., 2022), consistent with previous pandemics and epidemics (Magill et al., 2020). Numerous meta-analyses conducted at different stages of the pandemic indicated that health professionals exhibited elevated levels of psychological distress and posttraumatic stress symptoms compared with before the pandemic (e.g., Sheraton et al., 2020; Cénat et al., 2021; Wu et al., 2021; Andhavarapu et al., 2022; Lee et al., 2023).

Understanding factors that affect risk for psychological distress and posttraumatic stress symptoms among health-care workers is important because poor well-being and stress symptoms are associated with occupational burnout, poorer quality of care, and reduced patient safety (Oyeleye et al., 2013; Salyers et al., 2017; Kachadourian et al., 2022). Studies have also found that among health professionals, those who are exposed to violence or work in areas with higher case counts are at greater risk for mental health sequelae (Luo et al., 2020; Pappa et al., 2020; Sheraton et al., 2020; Trumello et al., 2020; De Kock et al., 2021; Mediavilla et al., 2021; Robles et al., 2021; Vanhaecht et al., 2021; Xiong et al., 2022; Narita et al., 2023).

The work of psychiatrists and other mental health professionals was profoundly disrupted by the COVID-19 pandemic. Changes in activities and priorities included redeployment to provide medical services or respond to the mental health needs of COVID-19 patients or their families (Vieta et al., 2020; Gourret Baumgart et al., 2021), provision of mental health services to other health professionals (e.g., COVID-19 front-line workers) (Gourret Baumgart et al., 2021), and a rapid shift to remote services (telehealth) to better meet the demand for services and to provide continuity of care (Montoya et al., 2022).

There have been few studies of the psychological impact of the pandemic on psychiatrists and other mental health professionals, and available studies are cross-sectional, include few participants or are geographically specific. One study found that during the early phase of the pandemic, most mental health professionals working in Lombardy, Italy, experienced mild levels of distress, whereas a significant minority exhibited severe levels of anxiety, depersonalization, and burnout (Rapisarda et al., 2020). Similar results were obtained in a study of mental health professionals in Piedmont, Italy, which found that rates of anxiety, posttraumatic stress, and burnout were lower among mental health professionals compared with frontline health-care workers (Franzoi et al., 2021). A study in Brisbane, Australia, reported high rates of distress and burnout among mental health professionals (Northwood et al., 2021). Although most participants experienced some reduction in self-reported anxiety over time, there was less improvement among individuals who were defined as having greater vulnerability to COVID-19 (e.g., due to age, work-related exposure, underlying health conditions, or being part of at-risk communities).

Although the COVID-19 pandemic was recently declared by the World Health Organization (WHO) as being over, understanding who among the mental health workforce was most vulnerable to psychological distress will inform management of future global disruptions to mental health services. This is particularly important because these services were already under considerable strain before the pandemic (World Health Organization, 2021), and there is compelling evidence of an increased global need for mental health services among the general public as a result of the COVID-19 pandemic (Gloster et al., 2020; Wang et al., 2020; Xiang et al., 2020; Cénat et al., 2021; Gruber et al., 2021; Wu et al., 2021; Chen et al., 2022a), including among health professionals (Cherepanov, 2020; Lu et al., 2020).

Longitudinal studies are needed to identify risk and protective factors for psychological distress among mental health workers during the pandemic and to explore the heterogeneity of findings reported in cross-sectional studies (Cénat et al., 2021; Chen et al., 2022b). They can also help to identify subgroups of individuals who share similar trajectories on psychological variables over time. This approach has been applied to longitudinal data following individuals after exposure to traumatic life events (Bonanno, 2004; Galatzer-Levy et al., 2018); health professionals' mental health during the COVID-19 pandemic in Spain (Mediavilla et al., 2021, 2022) and Finland (Rosenström et al., 2022); among health-care workers during the first wave of COVID-19 in Quebec, Canada (Dufour et al., 2021); those subjected to COVID-19 lockdown measures in Hubei, China (Chen et al., 2022b); and people living in France during the pandemic (Pellerin et al., 2022).

The current study is a longitudinal analysis of work-related psychological distress and posttraumatic stress symptoms across 3 time points during the COVID-19 pandemic among a large, multilingual, international sample of psychiatrists and other mental health professionals drawn from the Global Clinical Practice Network (GCPN) (Reed et al., 2015). Linear growth models were used to examine predictors of reduced occupational well-being and increased posttraumatic stress symptoms. We hypothesized that higher levels of COVID-19 mortality in respondents' countries as well as more limited national economic resources would contribute to a more stressful environment and increased psychological sequelae. We also hypothesized that stress and isolation related to public health restrictions would contribute to decreased work-related well-being and increased posttraumatic stress symptoms (Pancani et al., 2021). Finally, we examined different trajectories of occupational well-being and posttraumatic stress symptoms among mental health professionals over the course of the pandemic.

MATERIALS AND METHODS

Participants and Procedure

This was a longitudinal internet-based survey with 3 data collection periods. The study was approved by the Institutional Review Board at Columbia University/New York State Psychiatric Institute and the University of Ottawa Research Ethics Committee. Consent to participate was obtained from all participants. Participants were members of the WHO's GCPN, an international and multilingual network of mental health professionals, primarily psychiatrists and psychologists, representing all global regions (Reed et al., 2015). The GCPN was established in 2011 to participate in field testing of the Eleventh Revision of the International Classification of Diseases (Reed et al., 2019). Eligible members of the GCPN must have completed their professional training and be formally authorized to provide services to people with mental health conditions in their countries. At the time of this study, the GCPN comprised more than 16 000 participants from 163 countries.

Surveys focused on the effects of the COVID-19 pandemic on mental health professionals' practice and well-being were administered using Qualtrics (Provo, UT, USA) and were conducted in Chinese, English, French, Japanese, Russian, and Spanish. Survey questions were developed in English and translated by experts affiliated with the GCPN's International Advisory Group, which included representatives from diverse global regions who were fluent in each of the other 5 languages. GCPN members who at the time of registration had indicated that they were proficient in one of the study languages were sent an email invitation containing an individualized language-specific survey link. Upon accessing the link, participants were asked to read a description of the study and provide their consent to participate. Reminder emails were sent at 7, 14, and 21 days after the initial invitation to members who had not yet completed the survey. Data collection was closed 1 week following the final reminder for a total data collection period of 4 weeks per wave. Data collection for wave 1 occurred between June 4 and July 7, 2020; for wave 2 between November 11 and December 18, 2020; and for wave 3 between July 28 and September 7, 2021. The survey included questions about workplace status, occupational stressors related to COVID-19, practice changes due to the pandemic, occupational well-being, and aspects of the policies and procedures of the institutions in which participants worked. The analyses presented in this article were restricted to participants who responded to the survey in all 3 waves of data collection.

Dependent Variables

Two validated self-report measures were administered to explore the effect of the COVID-19 pandemic on GCPN members' occupational well-being and posttraumatic stress symptoms.

Well-Being Index (WBI)

The WBI (Dyrbye et al., 2013) is a validated 7-item measure that assesses occupational distress and well-being and has been used extensively in studies with physicians and other health professionals. Response options for the items are "yes" or "no," with 1 point assigned for each item endorsed in the affirmative. Higher scores on the WBI index reflect greater levels of distress. A cut-off score of 5 positive responses has been shown to predict reports of recent medical errors, suicidal ideation, poor mental quality of life, burnout, and high levels of fatigue among US medical residents (Dyrbye et al., 2014).

Abbreviated Posttraumatic Checklist (PCL-5, Civilian Version)

The Abbreviated PCL-5 (Lang et al., 2012) is a 5-item, widely used self-report screening instrument for posttraumatic stress disorder symptoms, which is sensitive to change over time. PCL-5 response options appear as a Likert scale of 5 levels ranging from "not at all" to "extremely." Higher scores on the PCL-5 reflect higher levels of posttraumatic stress symptoms. The cutoff for clinically significant symptoms on the PCL-5 is 12 (Lang et al., 2012).

Predictor Variables

Demographic characteristics of study participants (gender, age, years of professional experience, WHO region, and profession) were included as predictor variables in analyses of occupational well-being and posttraumatic stress symptoms. Additional predictor variables were time and 2 questions related to the work and social environment of the GCPN members that could possibly increase their levels of stress and reduce well-being: (1) whether they had provided direct in-person services to patients confirmed or presumed to have COVID-19; and (2) whether they had been the target of physical or psychological violence or maltreatment because of their role as mental health professionals, including being stigmatized or discriminated against, since the beginning of the pandemic.

Finally, 2 other predictors were included. The COVID-19 mortality rate in the participant's country (Ritchie et al., 2020) during the implementation period of each wave of data collection was included as an indicator of the severity of the pandemic, which would be expected to influence its effect on mental health workers (De Kock et al., 2021). A measure of the strictness of each country's response to COVID-19 during the implementation period of each wave of data collection, the stringency index (Hale et al., 2021), was also included. Increased stringency of response has been associated with increased psychological distress (Aknin et al., 2022).

Statistical Analyses

Differences in individual and country-level variables of interest across the 3 waves were analyzed using chi-squared tests for categorical variables and ANOVAs for continuous variables (Table 2).

Linear Growth Models

Several linear growth models were tested sequentially to determine the best fit for the longitudinal data. A maximal random effects structure was implemented to improve the robustness and generalizability of the findings (Barr et al., 2013). Separate models for WBI and PCL-5 scores were fitted using a restricted maximum likelihood criterion to identify those independent variables (fixed effects) that predict outcomes in mental health symptoms over time. We also estimated the intraclass correlation coefficient to compute the variability explained between participants and the marginal and conditional R-squared (Nakagawa and Schielzeth, 2013) to estimate the explained variance of the fixed effects and fixed plus random effects, respectively.

Latent Class Growth Models

Latent class growth models were used to identify latent clusters of individuals based on their common growth trajectories of WBI and PCL-5 scores, respectively, over time (see supplementary Content for details). Time was included as a covariate as fixed effect with random slopes and participants as random intercepts. The best latent class models were chosen based on (1) the

Table 1. Sociodemographic Characteristics of the Participants (n=786) vs GCPN Member Invited to Participate in the Study (n=15 157)

Variable	Final sample	GCPN invited	Statistical test
Gender			$\chi^2_{(2)}$ =9.55, P<.05
Male	422 (53.7%)	7336 (48.4%)	
Female	364 (46.3%)	7793 (51.4%)	
Other	0 (0.0%)	28 (0.2%)	
WHO region			$\chi^2_{(7)}$ =53.67, P<.001
AFRO	22 (2.8%)	488 (3.2%)	
AMRO-South	127 (16.2%)[a]	1580 (10.4%)[a]	
AMRO-North	82 (10.4%)	2082 (13.7%)	
EMRO	15 (1.9%)	444 (2.9%)	
EURO	338 (43.0%)	5906 (30.0%)	
SEARO	54 (6.9%)	739 (4.9%)	
WPRO-Asia	130 (16.5%)[a]	3529 (23.3%)[a]	
WPRO-Oceania	18 (2.3%)	389 (2.6%)	
Income level			$\chi^2_{(3)}$ =2.19, P=.533
Low	6 (0.8%)	130 (0.9%)	
Lower-middle	83 (10.6%)	1333 (8.8%)	
Upper-middle	220 (28.0%)	4270 (28.2%)	
High	477 (60.7%)	9424 (62.2%)	
Profession			$\chi^2_{(9)}$ =32.63, P<.001
Medicine	378 (48.1%)	7986 (52.7%)	
Psychology	294 (37.4%)[a]	4623 (30.5%)[a]	
Nursing	16 (2.0%)	358 (2.4%)	
Social work	27 (3.4%)	352 (2.3%)	
Other	22 (2.8%)	552 (3.6%)	
Sex therapy	27 (3.4%)	480 (3.2%)	
Counseling	0 (0.0%	31 (0.2%)	
Speech therapy	2 (0.3%)	14 (0.1%)	
Occupational therapy	19 (2.4%)	581 (3.8%)	
Certified peer support worker	1 (0.1%)	180 (1.2%)	
Age			$t_{(15941)}$ =6.62, P<.001
Mean (SD)	52.6 (11.0)[a]	49.2 (12.3)[a]	
Median [min, max]	52 [26, 87][a]	48 [24, 96][a]	
Years of experience			$t_{(15941)}$ =7.07, P<.001
Mean (SD)	21.5 (10.3)[a]	18.6 (10.9)[a]	
Median [min, max]	21 [2, 58][a]	16 [0, 69][a]	

Abbreviations: AFRO, African; AMRO, Americas; EMRO, Eastern Mediterranean; EURO, European; SEARO, South-East Asian; WHO, World health Organization; WPRO, Western Pacific.
[a]Post-hoc tests significant P<.001.

Bayesian information criterion; (2) the Akaike information criterion indices; (3) the entropy, which indicates the distinctiveness of the classes; (4) the Lo-Mendell-Rubin (LMR); (5) bootstrapped likelihood ratio tests (BLRTs); and (6) expected trajectories based on previous findings (Spurk et al., 2020; Chen et al., 2022b). We eliminated solutions with classes of less than 5% of the total sample because they tend to be unstable (Nylund-Gibson and Choi, 2018). Subsequently, we used ANOVAs and chi-squared tests to examine differences in those variables found to be significant predictors in the 2 linear growth models (i.e., for WBI and PCL-5) across the latent clusters identified (Table 5).

Statistical calculations except for BLRTs were performed with R statistical software version 3.6.1 using R studio version 2021.09.1 + 372. BLRTs were performed using Latent Gold (v. 6.0., Statistical Innovations Inc., Belmont, MA, USA).

RESULTS

Sample Characteristics

A total of 15 943 GCPN members were invited to participate in the study. Across all 3 waves of the study, 3986 (25.0%) of those invited consented to participate and participated in at least 1 wave of

Table 2. Bivariate Analysis of Variables of Interest by Wave

Variable	Wave 1	Wave 2	Wave 3	*P* value
COVID-19 death rate (millions)				
Mean (SD)	1.10 (1.53)	3.32 (2.84)	1.35 (1.42)	<.001
Median [min, max]	0.621 [0, 7.99]	3.45 [0, 15.2]	0.872 [0, 9.06]	
Stringency index				
Mean (SD)	64.1 (17.3)	60.9 (14.0)	53.4 (13.8)	<.001
Median [min, max]	70.8 [11.1, 96.3]	65.0 [8.33, 86.0]	49.5 [0.199, 87.7]	
Ever treated patients with COVID-19[a]				
No	638 (81.2%)	579 (73.7%)	531 (67.6%)	<.001
Yes	148 (18.8%)	207 (26.3%)	255 (32.4%)	
Ever experienced COVID-related violence[a]				
No	722 (91.9%)	714 (90.8%)	705 (89.7%)	.530
Yes	64 (8.1%)	72 (9.2%)	81 (10.3%)	
Well-being index[b]				
Mean (SD)	1.69 (1.72)	1.93 (1.90)	2.00 (2.03)	.002
Median [min, max]	1.00 [0, 7.00]	2.00 [0, 7.00]	1.00 [0, 7.00]	
Participants above clinical cutoff	61 (7.8%)	96 (12.2%)	117 (14.9%)	<.001
PCL-5 score				
Mean (SD)	8.60 (3.62)	8.36 (3.36)	8.03 (3.53)	.009
Median [min, max]	8.00 [5.00, 25.0]	8.00 [5.00, 22.0]	7.00 [5.00, 23.0]	
Participants above clinical cutoff	149 (19.0%)	121 (15.4%)	118 (15.0%)	.067

Abbreviations: PCL-5, PTSD Checklist for DSM-5. The *P* value corresponds to χ^2 tests for binomial variables and ANOVAs for continuous variables. The clinical cutoff for the Well-being index was 5 and for the PCL-5 score was 12.
[a]Note that this event can only change in one direction over time.
[b]Higher scores reflect poorer well-being.

data collection. A total of 786 GCPN members (19.7% of the sample who consented and 4.9% of those invited) participated in all 3 waves of the survey and constituted the sample for the present analyses.

Participant demographic and professional characteristics are shown in Table 1 as well as those of the total GCPN population. Overall, participants' characteristics were similar to those of GCPN members who did not participate in the study. All WHO global regions were represented in the sample of 786 participants, with the largest group residing in the European region (43.0%). Participants were from 86 different countries, with Japan (12.8%), Spain (8.9%), the United States (7.4%), and the Russian Federation (7.3%), accounting for one-third of the total sample.

Changes in Contextual and Outcome Variables Over Time

Table 2 shows bivariate analyses of changes in the predictor and outcome variables across the 3 waves of data collection. The restrictiveness of country-level public health measures to reduce COVID-19 infections, as measured by the stringency index, evidenced a decreasing trend over the study time period. Average occupational well-being of participating clinicians worsened over time ($P<.01$), and there was a significant increase in the proportion of participants scoring above the WBI risk cutoff, from 7.8% at Wave 1 to 14.9% at Wave 2 ($P<.001$). Mean level of posttraumatic stress symptoms decreased over time ($P<.01$). The proportion of participants scoring above the clinical cutoff for the PCL-5 decreased from 19.0% at Wave 1 to 15.0% at Wave 3, although this result was not statistically significant.

Linear Growth Models

For both the WBI and PCL-5, the best fitting models were conditional growth linear models with random intercepts and random slopes (see supplementary Table 1). For the WBI, the conditional growth model with random intercepts and random slopes had an AIC of 8992.31 and sample-size adjusted Bayesian information criteria (SSABIC) of 9078.72 with a likelihood ratio of 25.23 ($P<.001$). For the PCL-5, the random intercepts and random slopes had an AIC of 11878.42 and SSABIC of 11964.83 with a likelihood ratio of 6.06 ($P<.05$).

The full models with WBI and PCL-5 as dependent variables across 3 time points are shown in Table 3. The linear growth model, including fixed and random effects, explained 56.1% of the variance in WBI scores over time. The predictors explained 9.9% of the variance in the model. Significant predictors of WBI scores over time were time (β = .12, SE = .042, 95% CI = .04 to .20); being female (β=.40, SE=.118, 95% CI=.16 to .63); having provided in-person services to patients with COVID-19 patients (β=.51, SE=.069, 95% CI=.38 to .65); having experienced any form of COVID-related violence (β=.77, SE=.103, 95% CI=.57 to .98); and living in a low, lower-middle, or upper-middle income country as opposed to a high-income country (β=.28, SE=.113, 95% 95% CI=.06 to .50). Conversely, age was negatively associated with WBI scores such that older participants were less likely to demonstrate low well-being over time (β=−.02, SE = .008, 95% CI = −.04 to −.01).

The linear growth model, including fixed and random effects, explained 58.6% of the variance in PCL-5 scores over time. The predictors explained 6.7% of the variance in the model. Time

was negatively associated with PCL–5 scores over time (β=–.27, SE=.072, 95% CI=–.41 to –.13) as was being a physician (β=–.61, SE=.231, 95% CI=–1.07 to –.16). In contrast, being female (β=.76, SE=.217, 95% CI=.34 to 1. 19); having experienced any form of COVID-related violence (β=1.12, SE=.192, 95% CI=.74 to 1.50); living in a low, lower-middle, and upper-middle income country (β=1.04, SE=.210, 95% CI=.63 to 1.46); and higher rates of new COVID-19 deaths in the participant's country at the time of survey completion (β=.09, SE=.019, 95% CI=.05 to .13) were positively associated with PCL-5 scores over time.

We also tested the interactions between gender and other significant predictors. Although the overall model for the WBI that included the gender interaction term was found to be a significantly better fit than the model without this interaction effect (*P*=.003), none of the interactions were significant. In contrast, despite finding that the overall model for the PCL-5 that included the gender interaction terms was not a significantly better fit than the model without this interaction (*P*=.671), the interactions between gender and age as well as gender and years of experience for the PCL-5 scores were significant (*P*<.05). When the age and years of experience interaction terms were included in the model, the additional amount of variance explained was minimal (i.e., 1.07%).

Trajectories

Four latent mixed growth models estimating the slope and intercepts were tested that included from 1 to 4 latent groups for the WBI and PCL-5 data, separately (see supplementary Table 2). Three distinct trajectories emerged for both the WBI and PCL-5 scores across the 3 waves of data collection (Figure 1). The 3-class model for the WBI was retained and found to have a maximized log likelihood value=–4392.592; AIC=8813.184; SSABIC=8834.065; and entropy=0.672. The LMR ad hoc adjusted likelihood ratio test was significant (*P*<.001) as was the BLRT with 1000 iterations (*P*=.014). For the WBI, the estimated "chronicity" group (25.8% of the sample) was characterized by deteriorating well-being over time. The estimated "recovery" group (23.9% of the sample) started at a similar level of well-being as the estimated "chronicity" group but showed improvements across the 3 waves. The estimated "resilience" group (50.3% of the sample) exhibited high levels of occupational well-being across all 3 waves. The term "resilience" is used here to indicate a group of mental health professionals who exhibited better outcomes consistently across the period examined. The 3-class model for the PCL-5 was retained and found to have a maximized log likelihood value=–5731.926; AIC=11491.85; SSABIC=11512.73; and entropy=0.633. Whereas the LMR ad hoc adjusted likelihood ratio test was significant (*P*<.001), the BLRT was not significant at the .05 level (*P*=.092). For the PCL-5, the level of posttraumatic symptoms for each group was relatively stable over time. The estimated "chronicity" group (19.6% of the sample) was characterized by persistently high PCL-5 scores above the clinical cutoff at all 3 waves, the estimated "moderate stress" group (28.5%) exhibited a persistently moderate level of symptoms but one that was well below the clinical cutoff, and the estimated "resilience" group (51.9%) reported a low level of posttraumatic stress symptoms at all 3 waves.

Differences Between Trajectories

Exploratory bivariate analyses between variables of interest and the 3 trajectories extracted from the WBI and PCL-5 data, respectively, found that the participants in the WBI estimated "resilience" group were more likely to be male, tended to be older, and had more years of professional experience (Table 4). The WBI estimated "chronicity" group had a higher proportion of clinicians who had provided direct treatment to patients presumed to have COVID-19, and who had ever experienced any type of violence related to their role as health professionals during the pandemic (Table 4). For PCL-5 trajectories, we found that those in the estimated "resilience" group were more likely to be men, live in high-income countries, and be physicians (Table 5). The PCL-5 estimated "chronicity" group again had a higher proportion of clinicians who had ever

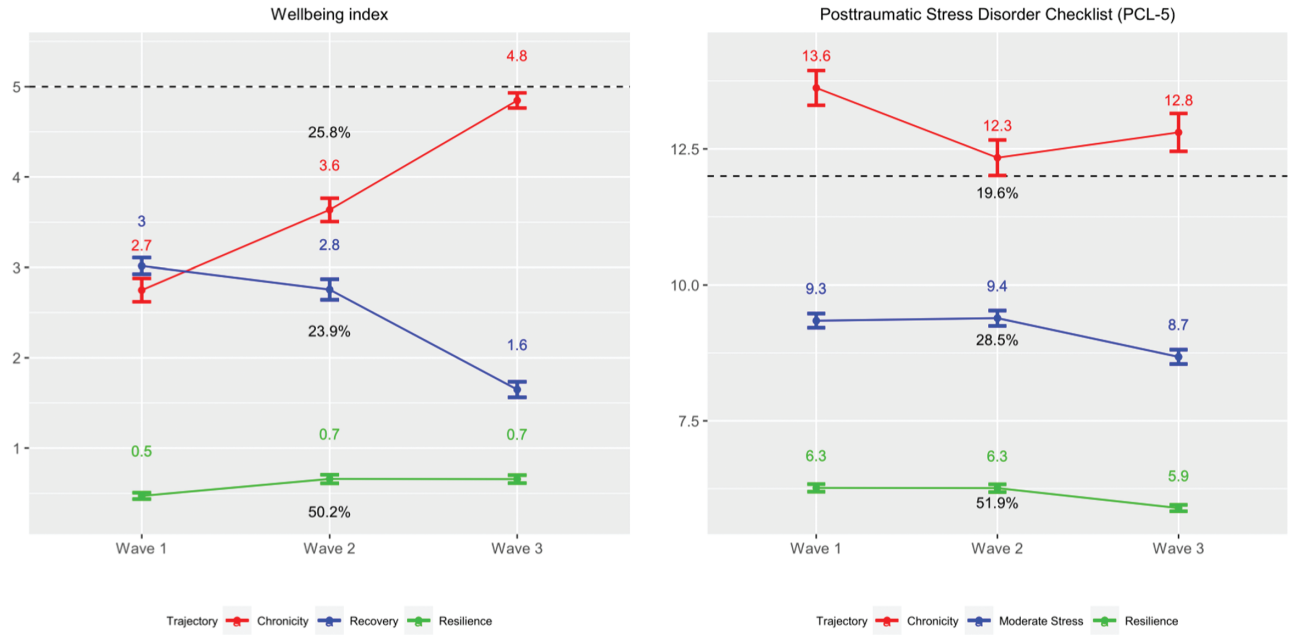

Figure 1. Group means for trajectories of well-being index and Posttraumatic Stress Disorder Checklist (PCL-5). Note: Dotted line represents the clinical cutoff score.

Table 3. Linear Growth Model with Random Intercepts and Slopes for WBI and PCL Against Main Predictors

	WBI score			PCL-5 score		
	β	SE	CI 95%	β	SE	CI 95%
Fixed effects						
Person level						
Time	.12**	.042	.04 to.20	−.27***	.072	−.41 to −.13
Gender (female)[a]	.40***	.118	.16 to.63	.76***	.217	.34 to 1.19
Age	−.02**	.008	−.04 to −.01	.01	.016	−.02 to.04
Years of experience	−.01	.008	−.02 to.01	.01	.017	−.03 to.04
Profession (physician)[a]	−.18	.119	−.42 to.05	−.61**	.231	−1.07 to −.16
Reported violence (yes)	.77***	.103	.57 to.98	1.12***	.192	.74 to 1.50
Treated patients with COVID-19 (yes)	.51***	.069	.38 to.65	.09	.119	−.14 to.33
Context level						
Income (low and lower-middle)[a]	.28*	.113	.06 to.50	1.04***	.210	.63 to 1.46
COVID-19 death rate (millions)	.02	.009	.00 to.04	.09***	.019	.05 to.13
Stringency index	−.001	.010	−.01 to.00	.01	.004	.00 to.02
Random effects						
σ^2		1.55			5.01	
$\tau_{00\ subject}$		1.17			8.33	
$\tau_{11\ subject.time}$		0.13			0.46	
$\rho_{01\ subject}$		−0.08			−0.54	
Goodness of fit						
Residual $_{mean}$		-6.62×10^{-15}			1.77×10^{-14}	
Adjusted ICC		.573			.556	
R^2 marginal		.099			.067	
R^2 conditional		.561			.586	

Abbreviations: ICC, intraclass correlation coefficientl; WBI, Well-being index; PCL-5, Abbreviated PTSD Checklist for DSM-5 …. SE and 95% CI were computed with a random block bootstrapping technique. Statistical significance levels are represented with asterisks as: * <.05, ** <.01, *** <.001.
[a]Time-invariant variables.

experienced any type of violence related to their role as health professionals during the pandemic and lived in countries with higher mortality rates due to COVID-19 (Table 5).

DISCUSSION

This multilingual study of a large, international sample of psychiatrists and other mental health professionals indicates that many have remained psychologically resilient in the face of the occupational and personal challenges associated with the COVID-19 pandemic. Infection rates, deaths, and public health measures differed substantially at the 3 time points tested. Average work-related well-being decreased over the course of the pandemic (Table 2), and a sizeable and increasing minority of participants (approximately 15% by Wave 3) reported low levels of occupational well-being that indicated risk for a variety of negative outcomes, including medical errors and occupational burnout. Concurrently, the average level of posttraumatic stress symptoms decreased slightly across the 3 waves as did the proportion of mental health professionals scoring in the clinical range on the PCL-5 (to 15% at Wave 3), although the latter decrease was not statistically significant. The idea that, on average, there is an immediate psychological response to the pandemic that tends to improve over time is generally consistent with previous literature on other health professionals (Holmes et al., 2020; Magill et al., 2020) as well as findings on the general psychological effects of stressors over time (Kessler et al., 2017), but the nature of the current study allowed for a finer-grained analysis. Findings on deteriorating occupational well-being suggest a continuing and cumulative effect that has been observed in longitudinal research among health professionals (Mediavilla et al., 2022; Sexton et al., 2022). Our results are also consistent with cross-sectional reports of the mental health consequences (e.g., symptoms of depression, anxiety, and posttraumatic stress) of the COVID-19 pandemic on health professionals (Lai et al., 2020; Liu et al., 2020; Lu et al., 2020; Cénat et al., 2021; Mediavilla et al., 2021, 2022; Aymerich et al., 2022) suggesting similar risks for mental health professionals. Existing studies focusing on mental health professionals in particular have primarily employed cross-sectional designs and are geographically circumscribed. Notwithstanding some variability across these studies in the type and degree of mental health sequelae observed among mental health professionals, overall, our findings confirm these earlier reports of elevated rates of mental health problems among mental health professionals during the pandemic (Rapisarda et al., 2020; Franzoi et al., 2021; Northwood et al., 2021). Although the COVID-19 pandemic has been declared by the WHO as over, the latter finding suggests significant vulnerability of the mental health workforce when confronted by global disruptions to healthcare systems, including for future epidemic and pandemics.

Table 4 Sociodemographic and Clinical Characteristics for Trajectories Groups in WBI Measure

Variable	Chronicity	Recovery	Resilience	Total	*P* value
	(n=203)	(n=188)	(n=395)	(n=786)	
Gender					
Male	94 (22.3%)	84 (19.9%)	244 (57.8%)	422 (100%)	<.001
Female	109 (29.9%)	104 (28.6%)	151 (41.5%)	364 (100%)	
Age					
Mean (SD)	49.0 (10.1)	48.6 (10.7)	54.3 (11.0)	51.6 (11.0)	<.001
Median [min, max]	48 [25, 73]	48 [27, 74]	55 [30, 86]	51 [25, 86]	
Experience					
Mean (SD)	19.9 (9.8)	18.7 (9.1)	23.6 (10.6)	21.0 (10.3)	<.001
Median [min, max]	19.3 [2.33, 49.7]	17.3 [1.67, 46.3]	22.3 [4, 57]	20 [1, 57]	
Profession					
Other	113 (27.7%)	99 (24.3%)	196 (48.0%)	408 (100%)	.364
Physician	90 (23.8%)	89 (23.5%)	199 (52.6%)	378 (100%)	
Reported violence					
No	180 (24.9%)	165 (22.8%)	379 (52.3%)	724 (100%)	<.001
Yes	23 (37.1%)	23 (37.1%)	16 (25.8%)	62 (100%)	
Direct clinical services to COVID-19 patientss					
No	152 (23.8%)	142 (22.2%)	346 (54.1%)	640 (100%)	<.001
Yes	51 (34.9%)	46 (31.5%)	49 (33.6%)	146 (100%)	
Country income group*					
Low	2 (33.3%)	0 (0.0%)	4 (66.7%)	6 (100%)	.084
Lower-middle	22 (27.2%)	13 (16.0%)	46 (56.8%)	81 (100%)	
Upper-middle	70 (31.8%)	62 (28.2%)	88 (40.0%)	220 (100%)	
High	109 (22.8%)	113 (23.6%)	257 (53.7%)	479 (100%)	
COVID-19 death rate per million (at time of data collection)[a]					
Mean (SD)	2.2 (1.4)	2.0 (1.4)	1.7 (1.4)	1.9 (1.4)	.112
Median [min, max]	2.3 [0.000196, 4.6]	2.0 [0.0, 5.1]	1.8 [0.0, 5.9]	2.0 [0.0, 5.9]	
Stringency index (at time of data collection)[a]					
Mean (SD)	60.7 (10.4)	59.7 (11.3)	58.7 (12.4)	59.5 (11.6)	.175
Median [min, max]	62.3 [6.6, 81.3]	62.3 [25.2, 81.3]	61.4 [25.2, 85.0]	62.3 [6.6, 85.0]	

[a]Statistical test adjusted by country based on Rao and Scott (1987).

Our finding of persistent poor work-related well-being among a significant minority of mental health professionals is concerning. Increased rates of mental health symptoms among health-care workers have been associated with concomitantly higher rates of burnout and compassion fatigue during the pandemic (Lluch et al., 2022). Health professionals have also been found to experience increased rates of moral injury (Litam and Balkin, 2021) and vicarious trauma (Li et al., 2020) due to stressor-related events during the pandemic. Mental health professionals are likely particularly vulnerable to these deleterious outcomes because of the nature of their work, which depends on developing durable relationships with people experiencing mental health difficulties, including being privy to information from their patients' own traumatic pandemic experiences (Aafjes-van Doorn, et al., 2020).

The linear growth models for the WBI and PCL-5 accounted for 56.1% and 58.6% of the variance in these outcomes, respectively, over time. Taken together, person-level and contextual factors included in the present study appear to be important determinants of the severity of mental health professionals' occupational well-being and posttraumatic symptoms (Table 3). However, most of the variance is explained by unobserved factors (random effects), with a relatively small proportion of variance explained by the fixed factors. Being a woman, treating COVID-19 patients in person, being a target of violence related to being a health professional, and working in a low- or middle-income country (LAMIC) were significantly associated with reduced occupational well-being over time. Older age was found to be a protective factor. Similarly, in the case of posttraumatic stress symptoms, being a woman, being a target of violence, country-specific COVID-19 death rates, and working in a LAMIC were associated with higher levels of symptoms over time, whereas being a physician was a protective factor.

Female health-care workers have consistently been found to be at significantly greater risk for psychological sequelae across studies of the COVID-19 pandemic (Carmassi et al., 2020; Luo et al., 2020; Sheraton et al., 2020; Trumello et al., 2020; De Kock et al., 2021; Robles et al., 2021; Vanhaecht et al., 2021; Mediavilla et al., 2022; Xiong et al., 2022). This is supported by both clinical

Table 5 Sociodemographic and Clinical Characteristics for Trajectories Groups in PCL-5 Scores

Variable	Chronicity	Recovery	Resilience	Total	*P* value
	(n=154)	(n=224)	(n=408)	(n=786)	
Gender					
Male	65 (15.4%)	109 (25.8%)	248 (58.8%)	422 (100%)	<.001
Female	89 (24.5%)	115 (31.6%)	160 (44.0%)	364 (100%)	
Age					
Mean (SD)	52 (11)	52 (11)	51 (11)	51.6 (11.0)	.554
Median [min, max]	52 [28, 86]	52 [29, 79]	51 [25, 80]	51 [25, 86]	
Experience					
Mean (SD)	22.3 (10.5)	22.2 (10.5)	20.7 (10.1)	21.0 (10.3)	.132
Median [min, max]	20.7 [3.33, 49.7]	21.7 [2.33, 49.7]	19.5 [1.67, 57.3]	20 [1, 57]	
Profession					
Other	89 (21.8%)	126 (30.9%)	193 (47.3%)	408 (100%)	.026
Physician	65 (17.2%)	98 (25.9%)	215 (56.9%)	378 (100%)	
Reported violence					
No	126 (17.4%)	210 (29.0%)	388 (53.6%)	724 (100%)	<0.001
Yes	28 (45.2%)	14 (22.6%)	20 (32.3%)	62 (100%)	
Direct clinical services to COVID-19 patients					
No	120 (18.8%)	185 (28.9%)	335 (52.3%)	640 (100%)	.455
Yes	34 (23.3%)	39 (26.7%)	73 (50.0%)	146 (100%)	
Country income group[a]					
Low	2 (33.3%)	1 (16.7%)	3 (50%)	6 (100%)	.013
Lower-middle	15 (18.5%)	26 (32.1%)	40 (49.4%)	81 (100%)	
Upper-middle	61 (27.7%)	75 (34.1%)	84 (38.2%)	220 (100%)	
High	76 (15.9%)	122 (25.5%)	281 (58.7%)	479 (100%)	
COVID-19 death rate per million (at time of data collection)[a]					
Mean (SD)	2.45 (1.39)	2.04 (1.39)	1.66 (1.37)	1.9 (1.4)	.042
Median [min, max]	2.55 [0.000196, 4.60]	1.95 [0, 5.09]	1.71 [0, 5.94]	2.0 [0.0, 5.9]	
Stringency index (at time of data collection)[a]					
Mean (SD)	63.6 (8.89)	60.1 (10.7)	57.6 (12.6)	59.5 (11.6)	.133
Median [min, max]	63.6 [40.3, 85.0]	62.3 [25.2, 81.3]	60.8 [6.55, 85.0]	62.3 [6.6, 85.0]	

[a]Statistical test adjusted by country based on Rao and Scott (1987).

and community studies that have established that prevalence of PTSD is higher in women than in men (Christiansen and Berke, 2020). Interestingly, studies of the general population have often not found such gender differences in response to the pandemic (see Cénat et al., 2021 for a meta-analysis of 55 studies). The women in our sample may have been more vulnerable given the additional stressors associated with caring for patients and the disproportionately greater demands on women related to home and family at a time when, for example, schools were closed in many places due to the pandemic. Women may also disproportionately occupy more stressful, lower status roles within their institutions, even when profession is held constant.

Health-care workers have been particular targets of harassment, bullying, and stigma due to their professional roles during the COVID-19 pandemic (Devi, 2020; Dye et al., 2020). Studies of health professionals demonstrate that those who are exposed to violence are at greater risk for mental health sequelae (e.g., Robles et al., 2021; Narita et al., 2023). Our findings demonstrate similar results among mental health professionals and extend earlier findings to show that being a target of such violence was a risk factor for both poor occupational well-being and posttraumatic stress symptoms. Although the overall prevalence of these experiences was relatively low, it had increased to an overall 10% of the sample by Wave 3; the impact of these experiences is striking. Violence targeting any health professional is unacceptable and must be remedied to ensure safe working conditions (McKay et al., 2020).

Working in an LAMIC was also found to be a risk factor for both poor occupational well-being and posttraumatic stress symptoms, even though the prevalence of PTSD in LAMICs has been reported to be lower in some studies (Dückers et al., 2016). LAMICs typically have an inadequate number of mental health professionals to address population mental health needs within their respective countries (World Health Organization, 2021), a situation that has been substantially exacerbated by the COVID-19 pandemic (Adhanom Ghebreyesus, 2020; Assefa et al., 2022). Compounding this problem are inequalities in access to resources to respond to COVID-19 (e.g., access to personal protective equipment during

the period of this study and continuing access to SARS-CoV-2 vaccines) (Gonsalves and Omer, 2022).

Country-specific COVID-19 death rate was a risk factor for development of posttraumatic stress symptoms but not a predictor of poorer occupational well-being. In contrast, having treated COVID-19 patients in person did predict poorer well-being but did not predict posttraumatic stress symptoms. COVID-19 death rates may contribute to posttraumatic stress symptoms as a more general environmental stressor that is not specific to the workplace, whereas exposure to infected patients is more likely to activate workplace concerns. Earlier studies showed an association between fear of infection and psychological distress among health-care workers (De Kock et al., 2021; Mediavilla et al., 2022).

Being a physician (97.4% of the physicians in our sample were psychiatrists) rather than another mental health professional (primarily psychologists) was found to be protective against posttraumatic stress symptoms over time. This may reflect differences in professional culture and better preparation to cope with health emergencies as a part of medical training, including much greater experience with life-and-death situations. This is consistent with the finding that, during the SARS epidemic, prior experience in treating infected patients was found to be a protective factor against development of posttraumatic symptoms (Carmassi et al., 2020). Older age was found to be a protective factor for poor well-being over time. This result is likely due to exposure to fewer non-pandemic-related stressors among older participants as has been described previously (Birditt et al., 2021). Vanhaecht et al. (2021) found that the association between COVID-19 and the deleterious mental health effects among Belgian health-care workers was greatest for 30- to 49-year-olds compared with older workers. Professionals with greater seniority are more likely to be employed in supervisory or administrative institutional roles with lower direct clinical demands and less demanding schedules. They may also experience less conflict with family demands.

Latent growth mixture models were used to identify distinct trajectories of well-being and posttraumatic stress symptoms across 3-time point from relatively early in the pandemic to after the development of effective vaccines, although these were still not widely available in many countries (Figure 1). Consistent with trajectory analyses of responses to COVID-19 among the general population in Hubei, China, and in France (Chen et al., 2022; Pellerin et al., 2022) and health professionals in Spain, Canada, and Finland (Dufour et al., 2021; Mediavilla et al., 2022; Rosenström et al., 2022), we found that most mental health professions either demonstrated good outcomes in the face of COVID-19 challenges; maintained moderate, nonclinical levels of stress symptoms; or showed improvements in occupational well-being after an initial period of difficulty. However, a significant minority of mental health professionals demonstrated either or both chronically poor well-being and elevated posttraumatic stress symptoms over the period of the pandemic covered by our study. For occupational well-being, this pattern was observed in 25.8% of participating mental health professionals. The group was initially indistinguishable from the estimated "recovery" group (Figure 1). But whereas the estimated "recovery" group's well-being improved over time, by the time of the third wave of data collection, the mean score for the estimated "chronicity" group suggested increased risk for a range of negative outcomes, including medical errors, poor mental health, suicidality, and occupational burnout (Dyrbye et al., 2014). Individual characteristics not measured here such as differences in personality, coping styles, social support, workplace practices, or help-seeking may explain the different trajectories observed. Future research should identify factors that can assist in the early identification of those belonging to the estimated "chronicity" group.

For posttraumatic stress symptoms, the estimated "chronicity" pattern was found in about 1 in 5 participating mental health professionals (19.6%), with mean elevations above the clinical cutoff across all 3 time points. Clinical elevations in posttraumatic stress symptoms cannot be said to represent a diagnosis of PTSD given that the stressor is currently ongoing, but they do represent a substantial level of symptomatology and suffering that may be associated with functional impairment, including in occupational functioning. Individuals in the estimated "chronicity" group for posttraumatic symptoms were significantly more likely than those in both the estimated "resilience" and estimated "recovery" subgroups to be female, to have been a target of violence related to their role as health professionals, to have provided direct care to COVID-19 patients, and to live in LAMICs with higher COVID-19 death rates and more stringent public health measures. Approximately 10% of participating mental health professionals reported both chronic poor well-being and chronic high levels of posttraumatic stress symptoms. Our findings suggest that occupational well-being and posttraumatic stress symptoms are related but separate constructs, highlighting that those with high, clinically significant posttraumatic stress symptoms rarely reported high levels of occupational well-being.

Limitations

The primary limitation of this study is that, although the sample is relatively large and geographically diverse, it may not be representative of mental health professionals worldwide. Moreover, the final sample of included participants may not be representative of all GCPN members. Compared with the GCPN, the final sample were found to be older, a lower proportion from Asia, as well as a larger proportion from South America, male and psychologists (Table 1). Thus, the results regarding poor occupational well-being and posttraumatic stress symptoms cannot be treated as prevalence estimates. Most members of the GCPN initially registered because they were interested in participating in field studies related to the Eleventh Revision of the International Classification of Diseases being conducted by the WHO (Reed et al., 2015) and are on average older and have more years of professional experience than the average mental health professional. Given our findings about age as a protective factor, this study may underestimate the level of poor occupational well-being and posttraumatic symptomatology related to COVID-19 among psychiatrists and other mental health professionals internationally. This possible bias might also apply to trends, as, for example, GCPN members whose psychological status worsened over time may have been less likely to reply to all the 3 waves of the survey. Another possible limitation due to the lack of availability of within-country regional data is the use of national COVID-19 mortality statistics for all participants living within a country. These data may under- or overestimate the actual mortality rates for specific regions. Furthermore, the reported statistics and inferences related to the associations between latent trajectory groups and sociodemographic variables are not based on observed, but rather estimated values of most likely latent group membership. Finally, elevations on self-report measures should not be assumed to equate to the presence or absence of a mental disorder.

CONCLUSIONS

The results of this study suggest a significant risk due to the COVID-19 pandemic to the already burdened global mental health workforce but one that is not evenly distributed. Although the pandemic has been declared over by the WHO, reported findings can serve to improve preparedness for future disruptions to mental health-care services. Slightly over one-half of the participants exhibited a pattern of resilience for occupational well-being and a similar proportion demonstrated a consistent pattern of low posttraumatic stress symptoms. However, a sizeable subgroup of mental health professionals experienced chronically poor occupational well-being approaching the clinical threshold and/or chronic posttraumatic stress symptoms. Mental health professionals exhibiting chronic trajectories are likely to be at greater risk for occupational burnout, providing poorer quality of care, going on medical leave, or leaving their profession (Oyeleye et al., 2013; Salyers et al., 2017; Lai et al., 2020; Kachadourian et al., 2022). Given the fact that the pandemic and its impact continue in many parts of the world, there may be further cumulative effects on a larger group.

Before the pandemic, the mental health workforce was already inadequate to meet existing mental health needs (World Health Organization, 2021). The pandemic appears to have increased the prevalence of mental health problems across the lifespan (Gloster et al., 2020; Cénat et al., 2021; Gruber et al., 2021; Wu et al., 2021) and worsened symptoms among those with preexisting mental disorders (Vindegaard and Benros, 2020). Our findings suggest that there is a significant risk of further erosion of the mental health-care workforce. The loss of professionals during this critical period of the pandemic would compound an already burdened system, particularly in LAMICs where resources are most limited.

Governments and institutions should adopt universally accessible prevention and intervention programs to address poor occupational well-being and stress-related symptoms among psychiatrists and other mental health professionals (David et al., 2022), particularly among those with the vulnerability factors identified by this study such as women, younger mental health workers, and those working in LAMICs.

Assistance programs may be tailored to these individuals and made accessible (e.g., through telehealth) by taking potential barriers into account (e.g., work schedules, childcare needs). This is important given that, for the most affected group of professionals, these problems will not simply go away on their own and concerted efforts are required to address them through adequately funded and sustainable programs as have already been implemented in some countries (David et al., 2022). Strategies must also be implemented to reduce violence against mental health professionals and ensure the safety of the workforce. Finally, there is a need to further expand the developing literature in this area that allows us to assess the long-term mental health impacts and needs of mental health professionals due to the pandemic. This will permit us to be better prepared for and better respond to future pandemics and health-care crises.

Supplementary Materials

Supplementary data are available at *International Journal of Neuropsychopharmacology (IJNPPY)* online.

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Interest Statement

None.

Data Availability

Data cannot be shared for ethical/privacy reasons.

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