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Short communication

Suicidality among healthcare professionals during the first COVID19 wave

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ABSTRACT

Background: Prevalence estimates of suicidal thoughts and behaviours (STB) among clinically active healthcare professionals during the first wave of COVID19 pandemic are non-existing. The main aim of this study was to investigate the 30-day prevalence of STB and associated risk factors.

Methods: As part of the Recovering Emotionally from COVID study (RECOVID), 30-day STB among healthcare professionals ($N = 6,409$) was assessed in an e-survey in healthcare settings in Belgium. The prevalence of STB and associated risk factors were estimated in multivariable models with individual-level and society-level measures of association. We used post-stratification weights to make the data representative for the entire clinical workforce in Belgium.

Results: Prevalence was 3.6% death wish, 1.5% suicide ideation, 1.0% suicide plan, and 0.0% suicide attempt. Thirty-day STB was (a) increased among respondents with lifetime and current mental disorders (mostly depression) and those hospitalized for COVID19 infection, (b) decreased among respondents with social support, and (c) unrelated to work environment.

Limitations: This is an explorative cross-sectional study using multivariate models that generates specific hypotheses on the prevalence of and risk factors for STB during the COVID19 pandemic rather than testing specific pathways that lead to STB onset.

Conclusions: Across age, gender, professional discipline, and exposure to COVID, lifetime and current mental disorders were highly associated with STB. These factors could guide governments and healthcare organizations in taking up responsibilities in preventing emotional problems and developing resilience among healthcare professionals during, but probably beyond, the current COVID19 pandemic.

1. Introduction

On March 13th 2020, the WHO considered Europe as the new epicenter of the COVID-19 pandemic. With only limited testing capacity in place, the cumulative number of confirmed cases in Belgium was >3100 when it went in lockdown on March 18th. At that point, 650 COVID-19 patients were admitted in hospitals, the very beginning of a wave that would occupy almost 6,000 hospital beds in April through June 2020 (Sciensano, 2020). Studies on the impact of previous epidemic outbreaks (Chua et al., 2004) and initial studies in the context of COVID-19 (Pappa et al., 2020) shed light on the potentially vast impact of the pandemic on healthcare professionals. Specifically front-line healthcare workers may be at highest risk of emotional impact because of the combination of the experienced impact of the pandemic, the social isolation due to social distancing, as well as their ongoing job requirements. Pappa et al. (2020) performed a meta-analysis including

13 studies with more than 30,000 professionals, reporting high proportions of depressive and anxiety symptoms, and sleeping problems. Although some studies are more optimistic about the impact (Tan et al., 2020), it is imperative to hold a finger close to the pulse, especially in regions that have less experience with such outbreaks. The most prominent limitation of scientific knowledge so far is that studies generally report upon anxiety or depression among healthcare workers, but, as far as we are aware of, none investigated the prevalence of suicidal thoughts and behaviours (STB). Another major limitation is that none of the studies on mental health impact was population-representative, which precludes the generalisability of the findings. The current study examines the (population-representative) prevalence of STB in healthcare professionals in Belgium, the country with the highest suicide rate within Europe. This study builds on our earlier work on prevalence and risk factors (domains) for STB (Bruffaerts et al., 2015) using both individual-level and society-level estimates.

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2. Methods

2.1. Procedures

Data come from the Recovering Emotionally from COVID19 (RECOVID) consortium. Data were gathered through a collaboration of 4 Belgium hospitals in Leuven-Brussels-Antwerp, one of the most populated regions in Europe, with 3 professional associations (i.e. medical doctors, practicing psychiatrists, and clinical psychologists) and the Flemish umbrella organization for healthcare institutions. For hospital sites we used administrative email distribution lists (i.e., census sampling); healthcare professionals were contacted through email and twice asked to complete a secure electronic survey. For the professional associations and the umbrella organization, the survey was announced and the weblink was posted on their website. No advertising of the survey was done; no incentives were offered. The study protocol was approved by the KULeuven Ethical Commission (approval #S63888).

2.2. Instrument

The instrument was developed within the World Mental Health consortium (<https://www.hcp.med.harvard.edu/wmh/>). For lifetime prevalence of emotional problems, we used screening questions asking for lifetime presence of depression, anxiety disorders (or problems with anxiety/nerves), problems with consumption of alcohol, medication, or other substances, panic disorder (or panic attacks), manic depression, mania, or bipolar disorder.

For current prevalence of mental disorders, we assessed 2-week prevalence of generalized anxiety disorder (GAD) with the GAD-7 (Spitzer et al., 2006), with a score range of 0–21: normal (0–4), mild (5–9), moderate (10–14), and severe (15–21) anxiety. Major depressive disorder in the past 2 weeks (MDD) was assessed with the PHQ-9 (Kroenke et al., 2001), with scores ranging from 0–21: normal (0–4), mild (5–9), moderate (10–14), and severe (15–21) depression. Thirty-day Post-traumatic stress disorder (PTSD) was measured with the four item version of the PCL-5 (Zuromski et al., 2019), with scores ranging from 0 to 16: 0–4 (normal), 5–8 (mild), 9–10 (moderate), 11–16 (severe). Substance use disorder (SUD) was evaluated with the CAGE-AID since the COVID19 outbreak (Hinkin et al., 2001), with scores ranging between 0 and 4: 0–1 (normal), 2 (moderate), 3–4 (severe). Panic was assessed with self-report of the number of panic attacks in the past 30 days: 0 (normal), 0–4 (moderate), 5+ (severe). The cutoff score for detecting MDD, GAD, PTSD, SUD, and panic attacks were set at the moderate categories, and thus 10, 10, 9, 2, and 1 respectively.

A modified version of the Columbia Suicidal Severity Rating Scale (Posner et al., 2011) was used to assess STB, including suicidal ideation (“In the past 30 days, did you wish you were dead or would go to sleep and never wake up?” and “In the past 30 days, did you have thoughts of killing yourself?”), suicide plans (“In the past 30 days, did you think about how you might kill yourself [e.g., taking pills, shooting yourself] or work out a plan of how to kill yourself?”), and suicide attempts (“In the past 30 days, did you make a suicide attempt [i.e., purposefully hurt yourself with at least some intent to die]?”). Any STB is defined as any positive answer on at least one of the STB questions.

2.3. Risk factor domains

Four risk factor domains were included in the risk analyses. First, lifetime emotional problems included depression, anxiety, substance use, bipolar problems, and panic attacks. Second, exposure to COVID19 infection included being infected with COVID19 and quarantined, being infected with COVID and hospitalized, and the experience of a close one who has been infected with COVID19. Third, work-related factors included working with COVID19 patients, working overtime, problems with work-life balance, conflicts with co-workers, and

shortage of professional equipment. Fourth, social support included whether respondents were living together (vs. not) or whether there was a social network available.

2.4. Statistical procedures

We provide descriptive statistics expressed in weighed proportions (%) and standard errors (SE). We ran independent multivariable logistic regressions for each STB category (except attempts, because of $n = 2$) to identify risk groups, including the risk factor domains described above. Also, multivariable population attributable risk proportions (PARP) were used to estimate the reduction in the proportion of each of the STB categories in the scenario where a specific risk factor may be omitted. Odds ratios and PARPs were adjusted for age, gender, profession, and each of the risk factors described above, to estimate the independent associations between risk factors and outcomes. Post-stratification weights (for gender, age, and profession) were used to represent the entire healthcare professional population in Belgium.

3. Results

3.1. Sample description

Between 6 April and 14 July 2020, 8,758 respondents provided data (50.9% medical doctors, 24.0% nurses, 8.4% psychologists, and 16.7% other professions). The response rate based on the surveys we obtained through the 3 hospital sites was 46.7%, ranging between 40.5 and 53.4% for hospital sites, and between 20.9% for MD through 60.3% for psychologists. We report only upon respondents with completed records ($N = 6,409$; mean age 41.6, $SD = 11.8$; 72.4% female; 77.6% living together; 77.7% obtained a university degree).

Lifetime problems with anxiety/nerves were endorsed by 12.1%, then depression (7.7%), panic attacks (2.8%), and substance use problems (0.9%). Any lifetime problem was estimated at 19.1%. Of all, 29.3% met criteria for a current mental disorder. MDD was most common (8.7%), then GAD (8.3%), substance abuse disorder (4.9%), and PTSD (2.6%); 19.5% reported panic attacks in the past month. Thirty-day prevalence of STB was 4.0%: 3.6% reported death wish, 1.5% suicide ideation, 1.0% suicide plan, and 0% suicide attempt ($n = 2$).

3.2. Individual-level associations of suicidality

Table 1 shows that having had a hospitalization because of COVID19 infection ($aOR = 11.58$) was most strongly associated with 30-day STB, followed by lifetime or current mental disorders (median aOR s between 2.90 and 3.63). Depression (either lifetime or current) strongly related to each STB outcome (median aOR 3.92); also SUD or PTSD were more than twofold associated with suicide ideation and/or plan. Respondents living together or those with a social network reported 18–43% less STB. When different risk factor domains were taken into account, we could see that the risk factors related to the working environment (such as problems with work-life balance or having experienced a shortage of professional equipment on the work floor) were largely unrelated to STB. When separate STB outcomes were taken into account, depression (either lifetime or current) was strongest associated with suicide ideation and/or plans (OR s around 5–6).

3.3. Society-level association of suicidality

The PARP models (Fig. 1) show that lifetime and current mental disorders accounted for 18–19% of the 30-day STB cases, respectively. Highest PARPs were found for lifetime and current depression (PARPs of 18–36%), but also other problems such as such current panic attacks or lifetime problems with anxiety yielded PARPs greater than 10. Being hospitalized because of COVID19 infection accounted for only a small fraction of the 30-day STB. Work-related variables such as shortage of

TABLE 1
 MULTIVARIATE RISK FACTORS FOR SUICIDAL THOUGHTS AND BEHAVIOURS AMONG HEALTHCARE WORKERS, RECOVID STUDY, N = 6,409.

Predictor classes	Independent variables	Predictor prevalence	death wish	suicide ideation	suicide plan	any STB
		% (SE)	aOR (95% CI)	aOR (95%CI)	aOR (95%CI)	aOR (95%CI)
Lifetime and current mental disorders	lifetime depression	7.7% (0.4)	3.6 (2.4–5.4)*	4.5 (2.6–7.9)*	3.7 (1.9–7.2)*	3.5 (2.4–5.1)*
	lifetime anxiety	12.0% (0.4)	1.6 (1.0–2.4)*	2.2 (1.3–3.9)*	1.6 (0.7–3.5)	1.8 (1.2–2.7)*
	lifetime panic attacks	2.9% (0.2)	1.5 (0.8–3.1)	1.2 (0.5–3.0)	2.7 (1.0–7.4)*	1.3 (0.7–2.7)
	lifetime substance abuse problems	0.9% (0.1)	1.0 (0.4–2.8)	0.8 (0.2–2.9)	1.1 (0.3–4.0)	0.8 (0.3–2.2)
	current MDD	8.7% (0.4)	4.6 (2.8–7.4)*	6.3 (3.4–11.6)*	5.6 (2.8–11.1)*	4.8 (3.0–7.6)*
	current GAD	8.3% (0.4)	1.4 (0.9–2.4)	1.0 (0.5–1.9)	0.9 (0.4–2.0)	1.4 (0.8–2.2)
	current PTSD	2.6% (0.2)	1.5 (0.8–2.8)	3.1 (1.5–6.3)*	2.9 (1.3–6.4)*	1.7 (1.0–3.0)
COVID 19 infection status	current panic attack	19.4% (0.6)	2.0 (1.3–3.1)*	1.3 (0.7–2.5)	1.3 (0.6–2.5)	1.3 (1.2–2.8)*
	current SUD	4.9% (0.4)	1.2 (0.7–2.1)	1.5 (0.7–3.1)	2.3 (1.2–4.5)*	1.4 (0.8–2.2)
	infected with COVID19 and quarantained	8.2% (0.4)	0.8 (0.4–1.4)	1.0 (0.5–2.2)	1.3 (0.6–2.5)	0.7 (0.4–1.2)
	infected with COVID19 and hospitalized	0.4% (0.1)	11.8 (2.1–67.6)*	7.6 (1.4–41.5)*	11.6 (2.5–52.7)*	11.5 (2.2–60.5)*
Work-related context	someone close infected with COVID19	28.8% (0.7)	1.0 (0.7–1.5)	1.0 (0.6–1.8)	1.0 (0.5–2.0)	0.9 (0.6–1.3)
	exposed to patients infected with COVID19	45.5% (0.7)	0.7 (0.4–1.0)*	1.1 (0.7–2.0)	1.0 (0.5–2.0)	0.8 (0.6–1.2)
	working overtime	25.3% (0.6)	0.8 (0.6–1.2)	0.6 (0.4–1.0)	1.0 (0.6–2.3)	0.8 (0.6–1.2)
	problematic work-life balance	46.6% (0.8)	1.2 (0.8–1.8)	1.0 (0.6–1.8)	1.1 (0.5–2.1)	1.2 (0.8–1.8)
	interpersonal conflicts with coworkers	18.0% (0.6)	1.2 (0.8–1.9)	1.2 (0.7–2.1)	1.2 (0.6–2.3)	1.3 (0.9–1.9)
	shortage of professional equipment on the workforce	51.5% (0.7)	1.2 (0.8–1.7)	1.6 (0.9–2.8)	1.4 (0.7–2.8)	1.2 (0.9–1.7)
	inadequate training to perform professional tasks on the workforce	21.8% (0.6)	1.2 (0.8–1.7)	1.2 (0.7–2.1)	1.1 (0.6–2.2)	1.1 (0.7–1.5)
	social network	78.3% (0.6)	0.6 (0.4–0.9)*	0.6 (0.3–0.9)*	0.6 (0.4–1.0)	0.6 (0.5–0.9)*
Social network	living together	– (2)	0.7 (0.6–0.8)*	0.8 (0.7–1.0)*	0.7 (0.6–0.9)*	0.7 (0.7–0.8)*
	social network	– (2)	–	–	–	–

(1) Odds ratios were adjusted for age, gender, profession, and each of the risk factors. Adjusted ORs are not provided for suicide attempts because of the low number of attempts in the sample (n = 2);
 (2) Predictor prevalence of social network is not provided because this is a continuous variable.
 * indicates statistical significance.

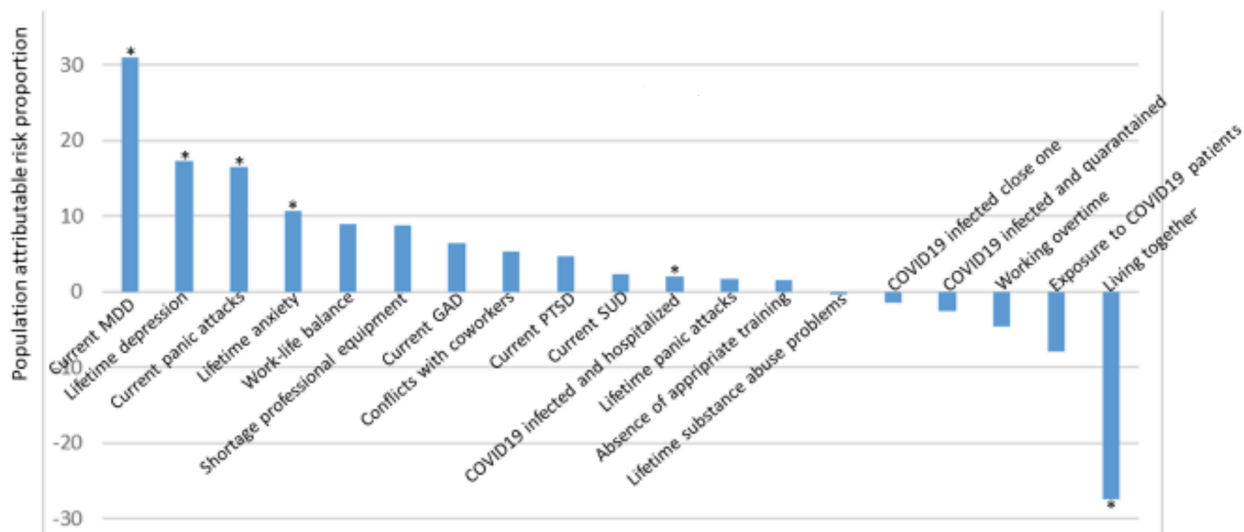


FIG. 1. MULTIVARIATE POPULATION ATTRIBUTABLE RISK PROPORTIONS OF RISK FACTORS FOR SUICIDAL THOUGHTS AND BEHAVIOURS AMONG HEALTHCARE PROFESSIONALS

professional equipment or working overtime yielded non-significant PARPs.

4. Discussion

This is the first study in Europe that estimated the proportion of cases of STB among healthcare professionals in the first COVID19 wave. We

estimated 30-day STB at 4% (around 10,000 of the ~254,000 active healthcare professionals in Belgium), mostly death wish and ideation. Lifetime and current emotional problems were strongly associated with STB, and that problems in the working environment were *not* significantly associated with STB.

The following limitations should be taken into account. First, the low response rate raises concerns about the representativeness of the sample

and stresses the necessity to replicate the study among a more diverse group of professionals. However, we have carefully weighted the data as to exactly reproduce the distributions of age, gender, and professional discipline of clinically active healthcare professionals in Belgium. Second, our data are based on screening instruments assessing a limited range of disorders. Some burdensome conditions (such as psychotic problems) or other relevant conditions associated with mental health (such as tobacco use) were not included in the RECOVID assessment. The estimates are based on screening instruments and should be interpreted as positive screens for mental disorders rather than true diagnoses. Third, this study is limited to the use of cross-sectional data, adjusting for many risk factors but only for a limited range of socio-demographic correlates (excluding detailed family situation). Future studies may include additional predictor domains to investigate patterns of STB throughout a professional clinical career and investigate all possible interactions between predictors.

While the cross-sectional nature of the data prevent us from inferring any causal association between the pandemic and STB, it is remarkable that observed rates are higher than those found in the general population (Nock et al., 2008), healthcare professionals (Dutheil et al., 2019), or even in deployed army personnel (Ursano et al., 2020). Healthcare professionals may have increased odds for developing emotional problems such as anxiety and depression, but we add to this knowledge that the pandemic may also increase STB among healthcare professionals. In addition, we confirm the role of lifetime and current emotional problems in their association with STB (Nock et al., 2008), but also shed light on two other findings. First, our data stress the importance of being infected with COVID-19 as an independent risk factor for STB: respondents who were infected with COVID-19 and hospitalized for this condition had 11-times more odds of also having STB. Second, our data also shed light on the fact that professional work context was *not* associated with STB. This is particularly important because previous reports did suggest that specific features of the working context (such as a shortage of professional equipment [Wang et al., 2020], disrupted work-life balance [Gomez et al., 2020], or working over hours [Greenberg, 2020]) were associated with emotional impact. Against this, there are 2 important conclusions for healthcare organizations in prioritizing safe working environments: (a) to improve the identification of STB and current mental disorders (especially depression) in healthcare professionals (Petrie et al., 2019) because our findings suggest that treating current MDE may lead to a reduction of one third of STB cases, and (b) to value the importance of positive social relationships (e.g. connectedness) among coworkers because our findings suggest that positive social relationships are associated with a 18–43% lower prevalence of STB.

In a critical era where both clinical care for patients and workplace wellbeing for healthcare professionals are essential elements of dealing with the COVID-19 pandemic, we found (across age, gender, professional discipline, exposure to COVID in the personal or professional context) that lifetime and current mental disorders were highly associated with STB. These factors could guide governments and healthcare organizations in taking up responsibilities in preventing emotional problems and developing resilience among healthcare professionals during, but probably beyond, the current COVID-19 pandemic.

AUTHOR CONTRIBUTIONS

Dr Bruffaerts, as principal investigator, had full access to all of the data in this study and takes responsibility for the integrity of the data, and the accuracy of the data analysis.

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 Analysis and interpretation of data: Bruffaerts, Alonso, Voorspoels, Kessler

Drafting of the manuscript: Bruffaerts, Voorspoels, Alonso
 Critical revision of the manuscript for important intellectual content: all authors

Statistical expertise: Voorspoels, Bruffaerts, Kessler
 Administrative, technical, or material support: all authors
 Supervision: Bruffaerts, Voorspoels, Alonso
 All authors contributed to and have approved the final manuscript.

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Declaration of Competing Interest

Dr. Kessler reports personal fees from Datastat, Inc., personal fees from Sage Pharmaceuticals, personal fees from Takeda, outside the submitted work. The other authors have nothing to disclose.

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