RESEARCH ARTICLE

Role of resilience in healthcare workers' distress and somatization during the COVID-19 pandemic: A cross-sectional study across Flanders, Belgium

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Funding information
No funding was received for this study

Abstract

Aim: To evaluate the impact and the possible role of psychological resilience in the COVID-19 pandemic outbreak on healthcare workers' mental and physical well-being in Belgium.

Design: This cross-sectional, survey-based study enrolled 1376 healthcare workers across Belgium from 17 April 2020 to 24 April 2020.

Methods: The study sample consisted of direct care workers (nurses and doctors), supporting staff and management staff members. The main outcomes are resilience, distress and somatization.

Results: Higher educational level was associated with lower symptoms of distress and somatization. Physicians exhibited the lowest risk of experiencing heightened levels of distress and somatization. Controlling for confounding factors, higher levels of resilience were associated with a 12% reduced chance of increased distress levels and 5% lower chance of increased somatization levels. Our results suggest the potentially buffering role of mental resilience on those working on the frontline during the COVID-19 pandemic outbreak.

KEYWORDS
COVID-19, distress, healthcare workers, mental wellbeing, resilience, somatization

1 | INTRODUCTION

Emerged in November 2019 in the capital city of Hubei Province of China, a novel coronavirus disease (COVID-19) spread in a few months throughout the world, becoming a global health emergency (Organization, 2020). On 4 February 2020, the virus was confirmed to have spread to Belgium with the first patient reported positive for the coronavirus (Federal Public Service (FPS) Health, Food Chain

Safety, and Environment (2020)). In early March, transmission in Belgium was confirmed and around the beginning of April 2020, the peak of infections in Belgium occurred, resulting in 1661 new infections in 1 day (Sciensano, 2020).

Given that acute healthcare organizations are at the frontline of any epidemic, the Belgian government tried to anticipate the pandemic by prompting the reorganization of entire hospitals in a few weeks by interrupting all elective medical activities so that the intensive care capacity could be upgraded to receive COVID-19 patients. This action was combined with national measures to flatten the epidemic curve to prevent a collapse of the healthcare system and to reduce hospital capacity strain (Godderis et al., 2020). At the peak of the pandemic in Belgium, 1,300 of the 5,700 hospitalized COVID-19 patients were admitted to the intensive care unit (Sciensano, 2020). Furthermore, in older peoples' care homes across Belgium, frail older people were infected with COVID-19, resulting in excess mortality in April 2020. This was the first time that healthcare workers across Belgium were being exposed to a risk of infection on such a large scale.

2 | BACKGROUND

Detrimental effects on healthcare workers' psychological health have been observed during earlier viral outbreaks, such as the 2003 SARS outbreak, demonstrating that the nature of healthcare work may impact medical and nursing staff mental well-being (Khalid et al., 2016). In Belgium, few studies investigated the negative impact of the COVID-19 pandemic on the mental well-being of healthcare professionals working (Tiete et al., 2021; Van Steenkiste et al., 2021; Vanhaecht et al., 2021). Negative symptoms such as hypervigilance were significantly more reported compared to before the COVID-19 pandemic, whereas positive professional symptoms such as the feeling that one can make a difference were less frequently reported (Vanhaecht et al., 2021). In addition, being a nurse, younger age, isolated, working on intensive care unit and an increased workload proved to be risk factors for mental health outcomes (Tiete et al., 2021; Van Steenkiste et al., 2021). Overall, international studies demonstrated that mental strain, huge stress reactions and possible short- and longer-term psychological sequelae can be predicted by factors such as wearing protective infection-control equipment and working in high-risk positions in combination with the increasing number of confirmed and suspected infected patients, uncertainty of having enough personal protection equipment, the immense workload and finally taking frontline care of infected, deteriorating and dying people thereby also risking their own health in the line of duty and the possibility of spreading the virus to their relatives (Khalid et al., 2016; Lai et al., 2020).

Over the past years, research has identified resilience as important for healthcare workers given the possible buffering role in dealing with the complex environment of practice (Delgado et al., 2017).

Resilience is defined as _"the process of adapting well in the face of adversity or significant sources of stress"_ (Arrogante &

Aparicio-Zaldivar, 2017). Resilience is referred to as a trait, personal attribute or even process or cycle that is related to a person's coping mechanisms (Cleary et al., 2018). There is a growing consensus that resilience might be an essential characteristic for healthcare professionals in their work environment, assisting them in coping with challenging working conditions and being important overall for a better quality of (work)life (Hegney et al., 2015; Kornhaber & Wilson, 2011). Numerous studies reported inverse relationships between resilience and specific negative outcomes, such as burnout, compassion fatigue, depression, anxiety, negative coping, stress, intolerance to uncertainty and concern about bad outcomes (Cooke et al., 2013; Hegney et al., 2015; Kelly et al., 2015; Kemper et al., 2015; Rahimi et al., 2014; Rees et al., 2015; Zander et al., 2009). While actions should be taken to address workplace stressors from an organizational point of view, there are limitations to mitigating workplace stressors in healthcare work, especially during a viral outbreak, such as the COVID-19 pandemic. Hence, it is important to consider how resilience may safeguard against these negative psychological sequelae (Werneburg et al., 2018).

Consequently, the aim of this study is twofold. First, we want to evaluate the impact of the COVID-19 pandemic on the mental and physical well-being of healthcare workers using a well-validated instrument to measure the most general, most common, expression of psychological problems in Flanders, Belgium and to study the relation with work characteristics and demographic variables. Second, we wanted to add to the existing research by investigating the possible role of mental resilience and its relation with mental and physical well-being. We hypothesized that after controlling for demographic variables, profession and working position, resilience would prove to be a protective factor.

3 | THE STUDY

3.1 | Design

This was a cross-sectional study using a survey that was distributed using an online survey that was distributed via e-mail to our network of healthcare professionals and social media platforms such as Facebook and LinkedIn. The STROBE guidelines for reporting cross-sectional research were followed (The, 2014).

3.2 | Method

The data collection was performed between 17 April 2020 and 24 April 2020. During this period, the invitation for participants was distributed once via e-mail to our network of healthcare workers and posted twice on social media. Informed consent was provided by all participants at the beginning of the online survey. The survey was in Dutch and consisted of sociodemographic questions and 2 validated questionnaires that have been extensively used across research: The CD-RISC-10 NI to measure resilience, and the 4DSQ subscales on

distress and somatization. It took approximately 15 min to complete the survey.

3.2.1 | Participants

A total of 1,657 fully completed surveys were received. Inclusion criteria were Dutch speaking, working as a direct care worker (nurse, midwife, nurse assistant or nurse aid), medical doctor, supporting staff member or management staff member in Belgium who were between 18 and 65 years old. A total of 281 participants did not meet the inclusion criteria based on their profession or age over 65 and were therefore excluded from the analysis. Consequently, full data were available for 1376 participants.

3.2.2 | Instruments

The first part consisted of a number of general questions, including gender, age, position, number of years of work experience, creed and whether the participant provided care for COVID-19-infected patients. The Connor-Davidson Resilience Scale was originally a 25-item scale to measure resilience in adults e.g. I am able to adapt when changes occur (Connor & Davidson, 2003). The 10-item Dutch version was developed by M.B. Danhof-Pont (CD-RISC-10 Nl) with a 4-point Likert scale (0 = not at all true to 4 = completely true) ranged between 0 and 40. The higher the score, the higher the resilience of an individual. The CD-RISC-10 showed the best combination of reliability, test–retest reliability, practicality and convergent and divergent validity across different countries and populations (Connor & Davidson, 2003; Kuiper et al., 2019). In the present study, Cronbach alpha was 0.87.

We used two subscales of the four-dimensional symptom checklist developed by Terluin et al., (2006). The complete questionnaire comprises 50 statements, which result in statements about four dimensions: distress (16 statements), anxiety (12 statements), depression (6 statements) and somatization (16 statements). Only the statements on the distress and somatization subscales were included in this study. The distress scale measures the kind of symptoms that people experience when they are "under stress" as a result of work pressure, psychosocial difficulties or negative experiences (e.g. During the past week, did you feel easily irritated?). The somatization scale measure symptoms of somatic distress and somatoform disorder (e.g. During the past week, did you suffer from pain the abdomen or stomach area?). Each statement is answered using a 5-point Likert scale ranging from "1 = no" to "5 = very often, continuously." The statements should be answered with how often complaints or symptoms have occurred in the recent past. Answers are then recoded in three categories: "1 = no" is scored 0, "2 = sometimes" is scored 1, and "3,4,5 = often or more" are scored 2 (Terluin et al., 2016). A score greater than 10 is considered to be a moderately increased distress or somatization possibly resulting in impending dysfunction, and a score greater than 20 is considered to be severely increased with serious tensions with a great risk of dysfunction (absenteeism); stress reduction is designated. The 4DSQ has been extensively tested for reliability and validity. Reliability is high (coefficients generally >0.80). Factorial, criterion and concurrent validity have been confirmed, and it was found to be a valid self-report questionnaire to measure the most general, most common, expression of psychological problems throughout different populations (Terluin et al., 2004, 2006, 2016). Cronbach's alpha in the present study was high, 0.94 and 0.87 for the distress and somatization subscale.

3.3 | Analysis

The data were analysed with IBM SPSS Statistics version 26. A p-value of <0.05 was considered significant. Continuous data were tested for normality using the absolute skewness (≤2) and kurtosis (≤7) for a total sample size greater than 300 (Kim, 2013). The mean and standard deviation were used as a measure of the central tendency and dispersion of continuous data. Percentages and numbers were used for discontinuous data. Differences were calculated using the chi-square test, independent t-test and one-way ANOVA. The Pearson correlation coefficients were calculated to investigate correlations between continuous variables. We fitted a hierarchical linear regression model to investigate the impact of resilience on study outcomes (distress and somatization) while controlling for demographic variables. Residual plots were used to evaluate the homoscedasticity assumption in linear regression. In the case of heteroscedasticity, a natural log-transformation was applied to the dependent variable (Rosopa et al., 2013). Multicollinearity was assessed using the variance inflation factor (VIF). Only univariate significant variables were included in the multiple linear regression analyses. Finally, we fitted a logistic regression model to study the impact of each significant independent variable, including resilience, on study outcomes. Both distress and somatization scores were dichotomized in the following manner: 0 equals a score between 0 and 10 (low risk), and 1 equals a score between 11 and 32 (medium to high risk). Only univariate significant variables were included in the multiple logistic regression analyses.

3.4 | Ethics

Data were collected taking into account the European legislation about the "General Data Protection Regulation" (= GDPR—General Data Protection Regulation). Because this concerns a study in which only adult healthcare workers participate on their own free will and after informed consent, based on the ICH-GCP principles[1] ethical approval was not sought for the present study. Informed consent was provided by all participants at the beginning of the online survey. Participants were allowed to terminate the survey at any time

TABLE 1 Participants demographics (N = 1376)

Characteristic	Value
Age (years), mean (SD)	40.15 (11.29)
Sex, n (%)	
Female	1248 (90.7)
Male	128 (9.3)
Married, n (%)	992 (72)
Have children, n (%)	796 (57.8)
Educational level	
Undergraduate	347 (25.2)
Bachelor	756 (54.9)
Master	273 (19.8)
Profession	
Direct care staff, n (%)	999 (72.6)
Nurse	818 (81.9)
Midwives	46 (4.6)
Nursing aid	135 (13.5)
Physician	92 (6.7)
Management	123 (8.9)
Supporting staff	162 (11.8)
Place of work, n (%)	
Acute care hospital	881 (64)
Elderly residential care home	230 (16.7)
Outpatient home care	265 (19.3)
Clinical experience (years), mean (SD)	16.1 (11.4)
Working with COVID−19 patients, n (%)	949 (69.0)

they desired. The survey was anonymous, and confidentiality of information was assured.

4 | RESULTS

4.1 | Study population

The demographics of the participants are summarized in Table 1.

The respondents' average scores on the distress and somatization subscales of the 4DSQ (see Table 2) were 13.7 (SD =8.5) and 8.3 (SD =6.2) respectively. For the distress subscale, a score of 13.7

indicates a moderately elevated score, and a score of 8 is below the cut-off point of 10 for the somatization subscale (Terluin et al., 2008; Terluin et al., 2006).

Significant inverse correlations were observed between age and work experience and distress scores ($r = -0.14$ ($p < .001$), $r = -0.14$ ($p < .001$) respectively). The somatization subscale exhibited a significant association with work experience ($r = -0.07$, $p = .009$).

Female respondents scored significantly higher on both the distress and somatization subscales (see Table 3). Moreover, somatization and distress scores were significantly higher for direct care staff compared with other professions. We also observed differences in distress and somatization depending on the educational level: Levels of distress and somatization were lower in those with Bachelor's versus undergraduate educational levels, and distress and somatization were reduced in those with masters' compared with bachelor's education levels. Master-level healthcare professionals exhibited the lowest levels of both distress and somatization compared with the other groups.

Significant differences in total resilience scores were observed between the different healthcare worker groups. Management scored significantly higher on resilience compared with the other groups. In addition, social status also revealed significant group differences. On contrary, educational level or working in the frontline shows no significant difference in resilience levels. Finally, higher resilience scores were associated with lower distress and somatization scores [$r = -0.16$ ($p < .001$) and -0.34 ($p < .001$) for distress and somatization respectively] (Table 4).

A 3-block hierarchical linear regression model (see Table 5) explained 4.1% of the variance in the block-1 model with gender and the level of education as significant predictors. The block-2 model explained 5.9% of the variance in distress with working with COVID-19 patients as a significant predictor. Finally, the block-3 model adding resilience as a significant predictor explained 16.0% of the variance in distress. In the second 3-block hierarchical regression model, the effect of the same independent variables on somatization was studied. We entered gender, years of work experience, marital status and educational level as predictors in block-1; profession and working with COVID-19 patients as predictors in block-2; and resilience as a predictor in block-3. All three models were significant. Finally, the block-3 model also proved significant, demonstrating that resilience

TABLE 2 Descriptive data distress, somatization and resilience

Variables	Items	α	Mean (SD)	High scores (%)	Medium scores (%)	Low scores (%)	Reported range	Scale range
Distress (4DSQ)	16	0.93	13.7 (8.5)	23.5	33.9	42.5	0–32	0–32
Somatization (4DSQ)	16	0.86	8.3 (6.2)	5.3	25.1	69.5	0–31	0–32
Resilience (CD-RISC−10)	10	0.87	29.6 (5.1)	9.4	42.6	48	5–40	0–40

Note: Cut-off values for the distress and somatization subscales were derived from Terluin et al., 2008:0–10: low; 11–20: moderately increased; 21–32: greatly increased. Cut-off values for the CD-RISC-10 with lowest to highest quartiles being 0–29, 30–32, 33–36 and 37–40. Q2 and 3 were added to calculate the medium scores (31).

Abbreviation: 4DSQ, 4-Dimensional Symptom Questionnaire; CD-RISC-10, Connor Davidson Resilience Scale 10 items.

TABLE 3 Descriptive analysis study variables distress, somatization and resilience and profession, place of work and working position

Scale	Sex Mean (SD)			Profession Mean (SD)					Place of work Mean (SD)				Working position Mean (SD)		
	Men	Women	p value[a]	Direct care	Physician	Supporting staff	Management	p value[b]	Hospital	Elderly care home	Outpatient home care	p value[b]	Frontline	Second-line	p value[a]
Distress	11.0 (7.9)	14.0 (8.5)	<0.001	14.2 (8.5)	10.4 (7.8)	13.4 (8.0)	12.9 (8.5)	<0.001	13.7 (8.4)	14.5 (8.5)	13.0 (8.7)	0.130	14.4 (8.5)	12.2 (8.1)	<0.001
Somatization	5.6 (5.5)	8.5 (6.2)	<0.001	8.7 (6.1)	5.3 (4.6)	7.6 (6.2)	7.8 (6.8)	<0.001	8.3 (6.1)	9.3 (6.8)	7.3 (5.8)	<0.001	8.9 (6.4)	6.9 (5.3)	<0.001
Resilience	30.5 (4.6)	29.5 (5.1)	0.044	29.5 (5.0)	29.5 (4.7)	28.6 (5.5)	31.9 (4.7)	<0.001	29.5 (5.1)	30.1 (5.1)	29.6 (5.1)	0.196	29.7 (4.9)	29.4 (5.5)	0.298

[a] Independent t-test.
[b] One-way ANOVA.

combined with other variables in the model explained 8.3% of the variance in somatization.

Finally, multivariable logistic regression analysis demonstrated that being a woman, being younger and having a lower educational level were associated with more severe symptoms of distress (see Table 5). Controlling for the previous confounders, in block-2, working in the frontline directly treating patients with COVID-19 was associated with more severe symptoms of distress. For somatization, being a woman and a lower educational level were associated with more severe symptoms. Work experience and marital status were no longer significant predictors. In block-2, controlling for the previous confounding factors, working as a frontline healthcare professional was associated with more severe symptoms of somatization. Profession was no longer a significant predictor. Finally, in block-3, controlling for all the previous factors, having a higher resilience appeared to be a protective factor for symptoms of somatization.

5 | DISCUSSION

Our results confirm the emotional turmoil experienced by healthcare workers in Flanders, Belgium during the COVID-19 outbreak and highlight concerns about the psychological well-being of physicians and nurses involved in the acute COVID-19 outbreak. Almost one-quarter of the participants scored above 20 on the distress subscale, indicating severe distress. For the somatization subscale, 5.3% of the participants exhibited a high risk for somatization. Physicians exhibited a significantly lower score on both the distress and somatization subscales compared to the group of direct care and supportive staff members. Healthcare workers who came in contact with COVID-19 patients (working position: frontline) scored significantly higher on both the distress and somatization subscales. In addition, our findings mirror the trends observed in other national and international studies (Lai et al., 2020; Tiete et al., 2021; Van Steenkiste et al., 2021; Vanhaecht et al., 2021).

Lai et al. (2020) found that more than 70% of their sample of healthcare workers reported symptoms of distress. When looking carefully at the distribution of their distress scores, 10.5% scored in the severe range, 24.5% in the moderate range and slightly more than 36% in the mild range; thus, in total, over 70% of the sample exhibited mild to severe symptoms of distress. These numbers are much higher than the psychological impact of the COVID-19 pandemic has on the general population (Chew et al., 2020). Consistent with previous studies on the impact of the COVID-19 crisis on healthcare workers' mental well-being, we found that being a woman, having a lower educational level and being younger were factors associated with more severe symptoms of distress and somatization. Furthermore, physicians showed the lowest scores on both the distress and somatization scales compared with direct care workers (undergraduate, graduate and bachelor nurses), who exhibited the highest scores on both scales. This finding is also in line with the recent study of Lai et al. (Lai et al., 2020), where physicians also demonstrated lower median scores on all scales compared with nurses. However, in the present

TABLE 4 Results of hierarchical linear regression analysis of distress and somatization ($N = 1376$)

Block	Variables	B	95% CI for B	β	p	R^2 Change (%-)
Distress						
1	Gender (woman)	2.212	0.755–3.668	0.076	**0.003**	0.041
	Age (years)	−0.042	−0.121 to 0.037	−0.056	0.297	
	Work experience (years)	−0.039	−0.116 to 0.038	−0.052	0.321	
	Marital status (married)	−0.705	−1.673 to 0.262	−0.037	0.153	
	Children (yes)	0.713	−0.195 to 1.621	0.042	0.124	
	Educational level (undergraduate)	1.538	0.536–2.54	0.079	**0.003**	
2	Profession (direct care)	0.309	−0.676 to 1.293	0.016	0.538	0.059
	Working position	−2.504	−3.423 to −1.584	−0.137	**<0.001**	
3	Resilience	−0.536	−0.618 to −0.454	−0.323	**<0.001**	0.16
Somatization						
1	Gender (woman)	0.411	0.261–0.562	0.146	**<0.001**	0.046
	Work experience (years)	−0.003	−0.007 to 0.001	−0.045	0.093	
	Marital status (married)	−0.075	−0.169 to 0.019	−0.042	0.118	
	Educational level (undergraduate)	0.201	0.102–0.3	0.11	**<0.001**	
2	Profession (direct care)	0.083	−0.018 to 0.184	0.046	0.106	0.069
	Working position	−0.241	−0.335 to −0.147	−0.138	**<0.001**	
3	Resilience	−0.019	−0.028 to −0.011	−0.122	**<0.001**	0.083

Note: multiple linear regression analysis, enter method using all univariate significant independent variables, p-model distress and somatization <0.001, Adjusted $R^2 = 0.15$ for distress and 0.08 for somatization, variance inflation factor (VIF) for both models <5; CI = 95% confidence interval; p = p-value; the somatization score was transformed using a natural log-transformation.

study, we also included supporting staff members and management staff scoring intermediate between physicians and direct care staff. Finally, our results clearly demonstrate the negative impact of working with COVID-19 patients during a pandemic outbreak. These results clearly highlight the complexity of the psychological response of healthcare workers to a pandemic outbreak. Healthcare workers in Belgium were being confronted for the first time with such a pandemic outbreak, leading to the experience of new and unexpected fears. Psychological distress symptoms might then be a normal reaction to an abnormal situation. Furthermore, these psychological distress levels may also be exacerbated by feelings of vulnerability and loss; the high transmissibility of the virus; the absence of vaccines and effective treatments; concerns about the health of self, family and others; the sudden risk of transitioning to severe acute respiratory distress syndromes (ARDS); and, in some places, the inadequate supply of personal protective equipment (Chew et al., 2020; Conversano et al., 2020; Lai et al., 2020). Moreover, different professions might have different concerns and needs.

Yet, the present study went beyond national and international studies on the impact of the first wave of the COVID-19 pandemic by also addressing the concept of resilience. Resilience is suggested to be a protective factor for psychological sequelae and refers to one's ability to respond and recover from adversity and setbacks (Werneburg et al., 2018). Resilience can be seen as a resource that provides and enhances coping mechanisms and

includes the capacity to thrive, rather than just survive and positively adapt in high stress environments (Cleary et al., 2018). Our findings are consistent with a growing body of evidence demonstrating the positive effect of resilience, such as the mediational role of resilience in the relationship between burnout and health in critical care professionals (Arrogante & Aparicio-Zaldivar, 2017). Resilience might prevent the occurrence of burnout syndrome caused by extensive strain due to chronic stress experiences, which has been found in healthcare workers during this pandemic outbreak (Bohlken et al., 2020). Furthermore, in our study, older, married, higher educated and participants with children displayed higher resilience scores compared to their counterparts. Hence, actions to enrol strategies in healthcare organizations and specifically those focused on younger, single, lower educated and frontline healthcare workers to promote and enhance individual resilience should be given adequate priority during but also in between different waves of a pandemic outbreak. Different attributes of a resilient individual have been defined in the literature: having a sense of oneself, self-efficacy, the ability to rebound and carry on, hope, caring, strong work-life balance, positive attitude, sense of purpose and possessing a prosocial attitude (Cameron & Brownie, 2010; Dyer & McGuinness, 1996; Gillespie et al., 2009). Promoting and improving individual resilience may be achieved by developing emotional insight and coping strategies, becoming reflective and maintaining a positive attitude through periods

TABLE 5 Multivariable logistic regression analysis of distress and somatization (N = 1376)

Block	Variables	Adjusted OR (95% CI)	p value
Distress (medium to high risk)			
1	Gender (woman)	1.860 (1.240–2.791)	0.003
	Age	0.992 (0.970–1.013)	0.445
	Working experience (years)	0.992 (0.971–1.013)	0.454
	Educational level (undergraduate)	1 [reference]	
	Bachelor level	0.676 (0.506–0.902)	0.008
	Master	0.550 (0.359–0.845)	0.006
2	Profession (Physicians)	1 [reference]	
	Management	3.519 (1.856–6.672)	<0.001
	Supporting staff	2.421 (1.298–4.514)	0.005
	Direct care staff	2.053 (1.143–3.685)	0.016
	Working position (frontline COVID care)	0.511 (0.394–0.662)	<0.001
3	Resilience	0.884 (0.862–0.907)	<0.001
Somatization (medium to high risk)			
1	Gender (woman)	2.421 (1.443–4.063)	0.001
	Working experience (years)	0.997 (0.987–1.008)	0.617
	Marital status (married)	0.795 (0.612–1.033)	0.086
	Educational level (undergraduate)	1 [reference]	
	Bachelor level	0.657 (0.498–0.866)	0.003
	Master	0.522 (0.334–0.814)	0.004
2	Profession (Physicians)	1 [reference]	
	Management	2.882 (1.350–6.148)	0.006
	Supporting staff	1.871 (0.916–3.822)	0.086
	Direct care staff	1.600 (0.747–3.424)	0.226
	Working position (frontline COVID care)	0.536 (0.406–0.708)	<0.001
3	Resilience	0.952 (0.929–0.975)	<0.001

Note: Multiple logistic regression analysis, enter method using all univariate significant independent variables, p-model distress and somatization <0.001, Nagelkerke R^2 = 0.05 for distress and 0.08 for somatization; CI = 95% confidence interval.

of hardship, mindfulness, professional identity and spirituality (Cleary et al., 2018; Delgado et al., 2017; Jackson et al., 2007) and training programmes, such as Stress Management and Resiliency Training [SMART; (Magtibay et al., 2017)], mentorship, flexible work arrangements and debriefing sessions following traumatic situations (Cleary et al., 2018; Delgado et al., 2017). Note, however, that the explained variance of the models in the present study was modest, ranging up to 16%. This finding is consistent with research suggesting that the impact of external factors, such as workload and work environment, is proportionally increased, especially during a pandemic outbreak.

5.1 | Limitations

This study has several limitations to be considered when interpreting the results. First of all, we used our own network and social media to distribute the survey. Therefore, selection bias could have occurred, and no response rate can be calculated. Second, the study groups (professions) were unequal in numbers. The largest group were direct care workers. Generalization to other groups must be done with caution. Finally, the study is a cross-sectional study lacking a longitudinal design. The study was performed at the peak of the pandemic in Belgium, and longitudinal follow-up is lacking.

6 | CONCLUSION

During the COVID-19 pandemic outbreak in Belgium, a significant proportion of healthcare professionals in our study experienced severe levels of distress. Resilience was associated with less severe levels of distress and somatization, suggesting the buffering role in working during a pandemic outbreak. Hence, actions to enrol strategies in healthcare organizations and specifically those focused on

younger, single, lower educated and frontline healthcare workers to promote individual resilience should be given adequate priority during but also in between different waves of a pandemic outbreak.

ACKNOWLEDGEMENTS

The authors would like to thank the participants in this study for their efforts made during the first COVID-19 wave in Belgium.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTION

EF, EG, HF, TT and PM contributed to the conception, design, analysis, collection of the data, interpretation of the data and have drafted and reviewed the work. GN, TO, DT, VRB, BK, SS and VBP have substantially revised the work and contributed to the data acquisition.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Data were collected and analysed anonymously, taking into account the European legislation about the "General Data Protection Regulation" (= GDPR - General Data Protection Regulation). Because this concerns a study in which only adult healthcare workers participate on their own free will and after informed consent, based on the ICH-GCP principles (https://www.ema.europa.eu/en/documents/scientific-guideline/ich-e-6-r2-guideline-good-clinical-practice-step-5_en.pdf) ethical approval was not sought for the present study. Furthermore, every potential respondent received an invitational letter containing information on the study objective and methodology, and informed consent was obtained at the beginning of the survey. Furthermore, participants were allowed to terminate the survey at any time they desired. The survey was anonymous, and confidentiality of information was assured.

CONSENT FOR PUBLICATION

Not applicable.

DATA AVAILABILITY STATEMENT

The datasets generated and/or analysed during the current study are available in the UAntwerpen repository, https://repository.uantwerpen.be/desktop/irua.

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ENDNOTE

[1] https://www.ema.europa.eu/en/documents/scientific-guideline/ich-e-6-r2-guideline-good-clinical-practice-step-5_en.pdf

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