EMPIRICAL RESEARCH MIXED METHODS

Struggling in the dehumanized world of COVID—An exploratory mixed-methods study of frontline healthcare workers' experiences

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Abstract

Aim: To explore healthcare workers' experiences of the changed caring reality during the COVID-19 pandemic in Sweden.

Design: An online fully mixed-methods design.

Methods: A web-based self-reported questionnaire with fixed and open-ended answers collected data from March to April 2021, analysed in three steps. First, free-text questions were analysed by qualitative content analysis. Then quantitative linear regression analyses using models covering stress and coping mechanisms were conducted. Finally, a meta-inference of qualitative and quantitative data emerged a new comprehensive understanding. The COREQ guidelines were used for reporting.

Results: Meta-inferenced results of quantitative and qualitative findings show the pandemic was a traumatic experience for healthcare workers. Main theme; *When work became a frightening experience in a dehumanized reality*, comprised four themes: Entering unprepared into a frightful, incomprehensible world; Sacrificing moral values and harbouring dilemmas in isolation; Lack of clear management; and Reorient in togetherness and find meaning in a changed reality. Qualitative results comprised four categories; Working in a dehumanized world; Living in betrayal of ones' own conscience; Lack of structure in a chaotic time and Regaining vitality together. Subdimensions comprehensibility and meaningfulness were associated significantly with post-traumatic stress disorder in multiple regression analysis. In multiple regression analysis, sense of coherence was the most prominent coping strategy.

Conclusions: Forcing oneself to perform beyond one's limit, sacrificing moral values and lacking management was a traumatic experience to healthcare workers during the pandemic. Reorienting as a way of coping was possible in togetherness with colleagues. There is an urgency of interventions to meet the needs among healthcare workers who took on a frontline role during the COVID-19 pandemic and to prevent mental health illness in future crisis.

Patient or Public Contribution: No patient or public contribution.

Summary: The pandemic outbreak exposed frontline healthcare workers to unparallelled stress shown as negative for their mental health in several meta-analyses and systematic reviews. In-depth understanding on experiences and how symptoms of post-traumatic stress disorder relate to coping mechanisms have been scarcely explored. This study contributes to understanding on healthcare workers' experiences and the relation between lower sense of coherence and increased risk of developing symptoms of post-traumatic stress disorder.

Implications for Practice/Policy: This study might guide how to prepare for resilience in future emergencies.

KEYWORDS

acute care, adult nursing, advanced practice, art of nursing, care, ethics, holistic care, mixed-method design, organizational development, work organization

1 | INTRODUCTION

With the swift worldwide spread of the novel SARS-Cov-2 virus in December 2019 causing Corona virus disease 2019 (COVID-19), a global healthcare workforce rapidly faced a new, unknown and extraordinary work situation (WHO, 2020). Sweden, among other countries in Europe, was initially hit hard with an exceeded mortality rate and overwhelming need for more intensive care units (ICUs). This led to a rapid transition of wards into dedicated COVID-19 wards exclusively admitting patients with COVID-19. All over the world, nurses, assistant nurses, midwives, physiotherapists and physicians among other professionals were relocated from a wide range of other units to perform unfamiliar work tasks and procedures with little opportunity for training and preparation (Jaarsma et al., 2020). When working conditions change rapidly and work tasks become new even to the most experienced healthcare workers' (HCWs), as was the case with the COVID-19 pandemic, questions arise concerning both the nature and consequences of such an experience. International studies in the early pandemic aftermath show that at least one in five HCWs reported symptoms of depression and anxiety, and almost four out of 10 HCWs reported sleep problems (Lanzara et al., 2023).

2 | BACKGROUND

Interest in HCWs' experiences of frontline work during the COVID-19 pandemic has been pervasive. Research in hard hit regions covering the first two COVID-19 outbreaks (in 2020) found that frontline work was associated with a higher risk of developing psychological distress and mental health disorders including post-traumatic stress syndrome (PTSS), and post-traumatic stress disorder (PTSD), especially among women and nurses (Carmassi et al., 2020; 2022; Galanis et al., 2021; García-Vivar et al., 2022). Experiencing stress is not to be equated with symptoms of PTSS or PTSD, although research strongly indicates the high risk of HCWs

developing PTSD due to stress when facing the COVID-19 pandemic emergency. A systematic review of research carried out on the mental health status of HCWs from December 2019 to April 2020, found stress as the primary cause of mental health disorders throughout the COVID-19 outbreak (Vizheh et al., 2020), confirmed by Carmassi et al., (2020, 2022). The impact of imbalances between exposure level, working role, years of work experience, social and work support, job organization, quarantine, age, sex, marital status and coping styles were also identified (Carmassi et al., 2022). Ethically conflicting caring situations, moral stress and symptoms of PTSD among HCWs have also been revealed (Deliktas Demirci et al., 2021; Hugelius et al., 2021). This confirms research conducted prior to the COVID-19 pandemic pointing at stress-related occupational ill health among HCWs (Halpin et al., 2017). Foremost among nurses, this is suggested being related to issues with task mastery and expectations from others as well as from the nurses themselves (Frögéli et al., 2019; Widarsson et al., 2020). Thereto, stressors relate to responsibility issues and lack of proximity to patients (Sørlie et al., 2005). A review shows that stress of conscience occurs when nurses are unable to provide good care in line with their obligations as caring professionals (Ericson-Lidman et al., 2013). This highlights the altruism in caring: to selflessly concern for others' guided by ones' inner core of what constitutes good care.

Despite hard and challenging experiences during the pandemic, it has also been pointed out that HCWs have been willing to care for patients with COVID-19 despite the risk to their own health. This dedication has been described as firm and involves existential courage to care for patients in need while ignoring the potential cost to own health (Slettmyr et al., 2022). The two-folded approach of HCWs experiencing severe stress yet wanting to participate and help has attracted researchers' interest in the immediate aftermath of the COVID-19 pandemic. This research is important not least to outline protective factors to enable the implementation of validated interventions that escalate preparations and protect HCWs during future pandemic outbreaks

(Deliktas Demirci et al., 2021). Sense of coherence (SOC), work engagement and self-compassion have already been found to protect from developing severe symptoms of stress (Domínguez-Salas et al., 2021; Ruiz-Fernández et al., 2021). A mixed-methods study exclusively addressing managers implied a high level of meaningfulness (a subdimension within the SOC scale) as being associated with creativity and complexity in terms of knowledge, thinking and argumentation. Strong leadership together with the ability to learn from experiences are suggested as factors in increasing preparation for the future (Mayer et al., 2021). Leading on from this, support from managers, colleagues, social support, adequate training for work tasks as well as positive coping strategies (especially humour and the ability to talk about one's feelings) are important protective factors regarding HCWs' mental health (Carmassi et al., 2020; Vizheh et al., 2020).

However, maintaining commitment to patient care while staying resilient to compassion fatigue requires certain abilities such as being equable and accepting suffering by cultivating ones' self-compassion (Ruiz-Fernández et al., 2021). Working environment factors at an institutional level such as lack of organizational preparedness and changing roles and responsibilities as well as interpersonal factors emotional connectedness of relationships have previously been found to significantly influence HCWs' responses in this area (Shamia et al., 2015) also shown significant during this pandemic (Chemali et al., 2022).

Despite awareness of the strain on healthcare systems all over the world caused by the COVID-19 pandemic validated intervention studies in this direction are still called for (Carmassi et al., 2020). It seems most likely that healthcare services will face further pandemics in the future placing demands on the support of both individual and organizational preparedness (Galanis et al., 2021). Given the suggested importance of stress, work engagement, SOC and self-compassion in previous studies, we conclude that one key point in understanding the mental health of frontline HCWs is to investigate how stressors and resilience can be understood. Increased evidence from systematic research valid in both qualitative and quantitative studies can then be applied in future practice interventions. Stress-related ill health and increased shortage of HCWs was an international escalating problem before the outbreak of the COVID-19 pandemic. Over the years, the negative impact on welfare systems calls for an urgent need to propose strategies to mitigate and manage stress. Mixed-methods studies successfully address a range of complex research questions by combining qualitative and quantitative approaches. Today, most studies appeal to either qualitative or quantitative measures leaving a gap for the use of mixed-method research technique and the enriched enhanced data it brings (Leech & Onwuegbuzie, 2010). To the best of our knowledge, there are few mixed-methods approach studies of HCWs during the COVID-19 pandemic. Those that do exist, indicate a high prevalence of psychological distress among HCWs during the COVID-19 pandemic and enhance the need for attention to their mental health (Galanis et al., 2021; García-Vivar et al., 2022; Xu et al., 2021).

3 | THE STUDY

3.1 | Aim and research question

The present study aims to outline the connection between stress, SOC and self-compassion by a mixed-methods approach on the impact of the COVID-19 pandemic on HCWs' experiences. An overarching theoretical and conceptual knowledge gap concerning HCWs' experiences of stress in relation to SOC and self-compassion confirmed the need for this study. By exploring the complexity in both qualitative and quantitative methods and in the integration of these data, we address the current paucity in mixed-methods research. By using a clear methodological mixed-methods approach outlining the integration phase/s we aim to mitigate contemporary problems with limitations in quality (Irvine et al., 2020). The first step was identifying the need to understand HCWs' experiences of the changed caring reality (the first wave in 2020) based on clinical observations of HCWs' work environment and health during the COVID-19 pandemic. Both qualitative and quantitative research questions were contextualized, and a mixed-methods methodology adopted to answer how HCWs experienced the COVID-19 pandemic in relation to stress, SOC and self-compassion.

4 | METHODS

4.1 | Design

This fully mixed-methods study had a concurrent, three-phased design. The first phase applied qualitative content analysis as first described by Graneheim and Lundman (2004) and developed by Graneheim et al. (2017) and Lindgren et al. (2020). The second phase employed linear regression analysis. In the third phase, a meta-inference of qualitative and quantitative findings was performed as described by Leech and Onwuegbuzie (2010). The study was reported according to the consolidated criteria for reporting qualitative studies (COREQ; Tong et al., 2007).

4.2 | Study setting

This study was conducted in one of the first regions to be hit hard by the COVID-19 pandemic outbreak in central Sweden, wave one lasted, February–August 2020 (SOU 2022:10). The site consisted of existing medical units, newly created medical units, ICUs and intermediate COVID-19 units within medical and acute care, all treating patients with COVID-19.

4.3 | Inclusion and exclusion criteria

Eligible study participants were nurses, physicians and assistant nurses with permanent employment in the medical section of the

hospital during the first wave of the COVID-19 pandemic. Exclusion criterion was HCWs who were on sick leave.

4.4 | Data collection and instruments

The data collection period lasted between 1 March 2021 and 1 April 2021 and was preceded by an information letter from managers via e-mail to nurses, assistant nurses and physicians with permanent employment at the medical section of the hospital during the first wave of the COVID-19 pandemic. One week later, HCWs were asked to participate in the study, in an e-mail from an independent external actor in accordance with the General Data Protection Regulation, (GDPR), of the European Parliament (EU: 2016/679). The digital invitation contained research participant information, informed consent and the questionnaire. A data-protected link with research person information according to the World Medical Association (2013) Declaration of Helsinki was attached explaining that participants could choose to refrain from participating at any time. HCWs who wished to participate gave written informed consent and were granted access to the questionnaire.

All data were obtained by an extensive online questionnaire containing self-reported sociodemographic and clinical data on COVID-19, coping strategies, followed by a request to describe participants' experiences of the COVID-19 pandemic in free writing.

4.4.1 | Qualitative question

Participants were asked to describe their experiences by the open-ended question:

> Please, describe in your own words experiences or events that you remember particularly well from the COVID-19 pandemic in your work. Please write in as much detail as possible. You can write about both positive and negative things.

4.4.2 | Quantitative questions

Participants were asked to self-rate answers from questions developed from reliable and validated instruments covering stress (PTSD), sense of coherence (SOC) and self-compassion (SCS). These are explained below and summarized in Table 1.

4.4.3 | Post-traumatic stress disorder—PTSD

We used a questionnaire corresponding to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) symptom criteria for PTSD to measure symptoms of post-traumatic stress (Blevins et al., 2015). We used the total symptom PTSD severity score with

TABLE 1 Quantitative scales.

Instrument	Symptoms of posttraumatic stress disorder (PTSD)	Sense of coherence (SOC-scale)	Self-compassion scale (SCS)
Research question	How much are health care workers (HCWs) bothered by each symptom of PTSD during the last month?	How do HCWs maintain and develop health in difficult situations?	How do HCWs respond to one's feelings of personal inadequacies and suffering in life?
Questionnaire	A 20-item questionnaire corresponding to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) symptom criteria for PTSD. (Blevins et al., 2015)	A 13-item questionnaire operationalizing the multidimensional Orientation to Life Questionnaire. (Antonovsky, 1993)	A 26-item instrument for measuring self-compassion. (Neff, 2003).
Scale	Likert scale 1 = Not at all to 4 = Extremely	Likert type scale 1 = very often to 7 = very rarely or never	Likert scale 1 = Almost never to 5 = Almost always
Subscale	None	Comprehensibility—(ability to understand what happens) Manageability—(ability to manage the situation) Meaningfulness—(ability to uphold meaning in the situation)	Self-kindness—(treating oneself with kindness when suffering) Self-judgement—(judging one's shortcomings). Common humanity—(recognizing one's failures as part of being human) Isolation—(isolating oneself from others) Mindfulness—(being aware of one's shortcomings) Overidentification—(over-identifying with painful thoughts and emotions)
Range	0-80 higher score indicating increased PTSD symptom severity.	13-91 including all three scales. Higher scores indicate greater SOC.	26-130 in all, representing both positive / negative items. The mean score of the subscales and the overall grand mean were used.

a range between 0 and 80. Internal consistency in our sample was acceptable (Cronbach's α = .965).

4.4.4 | Sense of coherence scale—SOC-13

The questionnaire operationalizes the multidimensional Orientation to Life Questionnaire/SOC scale which measures how people view life and relate to stressful situations. SOC springs from the salutogenic model, which is health promoting, improving resilience and to maintain and develop both physical and mental health, quality of life and well-being. The SOC scale consists of a total scale and three dimensions: comprehensibility, manageability and meaningfulness covering the ability for people to understand what happens around them, to what extent they can manage the situation on their own or with help from significant others, and the ability to uphold meaning in the situation (Antonovsky, 1993). SOC is scored on a 7-point Likert-type scale. Before the total scale was calculated, five out of 13 items were reversed. Each dimension is scored on a Likert-type scale ranging from 1 (very often) to 7 (very rarely or never). It is a valid, reliable and cross culturally applicable instrument for measuring SOC (Eriksson & Lindström, 2005). In our sample, internal consistency was acceptable (Cronbach's α = .882).

4.4.5 | Self-compassion scale—SCS

This instrument has been scored as an overall tool for measuring self-compassion. The SCS has been validated in different countries and populations and demonstrates good psychometric properties for measuring self-compassion. SCS is based on six subdimensions: self-kindness, self-judgement, common humanity, isolation, mindfulness and over-identification (Lopez Angarita et al., 2015; Neff, 2003). Subdimensions self-judgement, isolation and over-identification were reversed before the total grand mean of self-compassion was computed. Internal consistency in this sample was acceptable (Cronbach's α = 0.915).

4.5 | Analysis

First, we analysed data from the open-ended question by qualitative content analysis to identify domains as described by Graneheim and Lundman (2004), Graneheim et al. (2017) and Lindgren et al. (2020). Initially, the transcriptions were read through thoroughly while making highlights in the text whether the experience was expressed as positive or negative. Two of the authors then independently coded the transcripts by using N'vivo 1.6 software. This promoted a systematic approach to the analysis, and the process of condensation and formulating subcategories and categories. When discrepancies in coding occurred, discussions in the entire research group contributed to a pervasive analytic process.

Second, we analysed survey data and performed descriptive statistics including frequency (n), percentage (%), mean (M), standard deviation (SD), median (Md) and interquartile range (IQR) to describe participants' sociodemographic, characteristics and study variables. Linear regression analysis was applied to explore the relationship between SOC, SCS (predictors) and symptoms of PTSD (dependent variable). The main predictors consisted of SOC, SCS, age and gender. Each main predictor (SOC) consisted of three sub-predictors (comprehensibility, manageability, meaningfulness) and SCS consisted of six sub-predictors (self-kindness, self-judgement, common humanity, isolation, mindfulness, overidentification). See Table 1. We investigated SOC and SCS (both in total and for subdimensions) in relation to stress (symptoms of PTSD). Simple and multiple linear regression analyses were conducted adjusted for age and sex. Residuals for all regression models were validated for normality, constant variation and linearity and showed acceptable properties for conducting linear regressions. All quantitative analyses were conducted with IBM SPSS Statistics version 28.0.0.0. A p-value lower than α .05 was considered as significant.

Third, we completed the 13 steps of a mixed-methods design as presented by Leech and Onwuegbuzie to synthesize results from qualitative and quantitative analyses (2010). This was undertaken by analysing the categories and subcategories from the qualitative analysis in relation to symptoms of PTSD, SOC and self-compassion. Finally, to fully outline the mixed-methods approach, qualitative and quantitative data were synthesized into a new comprehensive whole, a meta inference. This was made by merging and comparing the findings and discussing the new comprehensive understanding in the entire research group (Leech & Onwuegbuzie, 2010).

4.6 | Ethical considerations

This research received ethical approval from the Swedish Ethical Review Authority (dnr 2020-05556) and was conducted in compliance with the Swedish Ethical Review Act (SFS 2003:460) following the principles in the Declaration of Helsinki (World Medical Association, 2013). The study was approved by the head of the department and each participant reviewed information about purpose and procedures of the study, including assurance of confidentiality, before beginning the online survey. All participants provided informed consent digitally.

5 | FINDINGS

5.1 | Characteristics of participants

In total n = 321, HCWs were invited to participate in the study of whom n = 96 (29.9%) participants responded to the survey and 47 of them responded to the open-ended question. Almost all participants had experience of caring for people with suspected or confirmed COVID-19 infection (95.8%). Most of the participants were women (84.4%), nurses (53.1%) and had not worked specifically with

patients ill from infectious diseases before (82%). COVID-19-related redeployment was experienced by 36.5%. Age ranged from 21 to 69 years covering working experience from less than 1 year up to 42 years. For demographic overview, see Table 2.

5.2 | Qualitative findings

Findings in the qualitative part of the study are presented in four categories summarizing 12 subcategories, for an overview see Table 3. The categories are presented under subheadings and subcategories in **bold italics** in the text. Participants described the world of the COVID-19

TABLE 2 Sociodemographic characteristics of healthcare workers, (HCWs), (N = 96).

Age years, median (q1–q3)	44 (32–55)
Sex, n (%)	
Women	81 (84.4)
Men	15 (15.6)
Civil status, n (%)	
Single-person household	21 (21.9)
Co-habitation household	74 (77.1)
Work role, n (%)	
Assistant nurse	33 (34.4)
Nurse	51 (53.1)
Physician	12 (12.5)
>10	57 (59.4)
Provided care of patients with COVID-19, n (%)	
Yes	92 (95.8)
No	4 (4.2)
Sense of coherence[a], SOC, mean (SD)	65 (14.76)
Subdimensions, mean (SD)	
Comprehensibility	24.03 (6.75)
Manageability	20.02 (5.18)
Meaningfulness	21.30 (4.38)
Self-compassion[b], SCS, mean (SD)	3.14 (0.68)
Subdimensions, mean (SD)	
Self-kindness	3.02 (0.85)
Self-judgement	3.25 (0.90)
Common humanity	3.01 (0.89)
Isolation	3.30 (1.01)
Mindfulness	3.21 (0.76)
Over-Identification	3.03 (0.99)
Posttraumatic stress disorder, PTSD[c], median (q1–q3)	10 (4.0–26.75)

[a]Sense of coherence (SOC), overall computed as total score (higher score = increased SOC).
[b]Self-compassion (SCS), overall computed as grand mean (higher score = increased SCS).
[c]Symptoms of post-traumatic stress disorder (PTSD), overall computed as total score (higher score = increased PTSD).

TABLE 3 Result overview qualitative results (N = 47).

Sub-category	Category
caught in a time of fear and anxiety situations of involuntariness loss of control abandoned in a frightening world	Working in a dehumanized world of COVID
carry moral burdens engage in unworthy acts forsake the private life	Living in betrayal of one's own conscience
grope in the dark for information being in an ambiguous armour	Lack of structure in a chaotic time
the power of togetherness learn together reorient in a changed world	Regaining vitality together

pandemic as a frightening disaster zone and found experiences hard to describe to others living in the outside world. Caring for patients meant carrying out work without proper instructions or preparation and entailed making personal and ethical sacrifices. Subsequently, a reorienting process of adjustment in togetherness with colleagues took place.

5.2.1 | Working in a dehumanized world of COVID

This category comprises HCWs' common experience of having to balance and navigate through traumatic and dehumanized conditions caused by the COVID-19 pandemic. The abrupt intrusion of the pandemic threatened the participants' own health and entailed an imminent threat to spread the infection to others. The responsibility was a heavy burden and severe strain created progressive uncertainty and anxiety about what to face next. Participants describe the transition as being ***caught in a time of fear and anxiety***. The fear devoured energy to the point that participants considered quitting healthcare.

> To be terrified of being infected and of our patients becoming infected eats me up and I feel that I have distanced myself from my colleagues. I feel completely exhausted and strongly consider quitting work in healthcare.
>
> (Participant 19)

The work situation is described as more demanding, difficult and stressful than before with no time for reflection. Unreasonable working conditions are emphasized as there is no time for preparation or introduction before performing advanced tasks such as respirator care without having done so before. Being thrown into a foreign work environment relates to anxiety and participants describe ***situations of involuntariness*** with these relocations.

> I was thrown in without introduction on step-down where the information was that the patients, we were to meet could be cared for by a semester four student. How wrong this was!
>
> (Participant 21)

Forcing oneself to perform beyond one's limit to live up to expectations is described as traumatic and feelings of powerlessness are described as **loss of control**.

> I ended up in situations where I did not have the time to learn properly … It made my stomach-ache every day when I went to work because I was afraid of ending up in situations that I felt I did not really master.
>
> (Participant 31)

Working in protective equipment is described as heavy on the body while energy was absorbed because of the need to focus on continuously changing recommendations on which protective equipment to be used and worrying about its safety.

The bodily response in terms of physical symptoms such as losing words, experiencing anxiety symptoms at the very thought of caring for COVID-19 patients is described as having consequences for one's own health and for caring work. Tasks take longer than usual, and participants describe fatigue and difficulty enduring. This is described in terms of unreasonable conditions and feelings of being **abandoned in a frightening world**.

> The feeling when I put on the protective equipment for the first time and met my very first patient ill with COVID-19 still gives me shivers. I became cold, sweaty, and dizzy.
>
> (Participant 19)

Altogether this is understood as working in a dehumanized world of COVID.

5.2.2 | Living in betrayal of one's own conscience

Professional ethics were described as shattered in the participants' caring reality and internal conflicts arose concerning not being able to alleviate suffering and provide dignified care. The COVID-19 pandemic unavoidably entails encounters with one's conscience described as being forced to **carry moral burdens**. The participants explain that isolation of patients means lost human contact, which is described as poorer care. Remaining difficult memories are described as a permanent torment. Not being able to make things easier for colleagues is explained as adding to a troubled conscience. Feelings of anger when colleagues do not want or are unable to care for patients with COVID-19 lead to dialogue with one's own conscience causing persisting feelings of shame and guilt.

> I think it has been terrible to witness colleagues' fear of COVID-19. In some cases, I have become angry at them. I am ashamed of that.
>
> (Participant 1)

Having to persevere in abusive life endings and **engage in unworthy acts** where a person's life ends in a body bag without relatives present is described as going against one's own intention to care, to do good for the patient and their relatives.

> The absolute hardest thing was to put the deceased in body bags without making them nice for a final farewell and that some due to high workload had to die alone.
>
> (Participant 5)

The pandemic had a major impact on the participants' private lives, by forcing them to **forsake the private life**. Impact on privacy is mainly caused by mandatory schedules with extended weekend service and being called in or relocated at short notice. In that sense, the transition is described as encroaching more on life outside work than before.

> Life has become lonely.
>
> (Participant 33)

5.2.3 | Lack of structure in a chaotic time

The search for information on the use of protective equipment is often done on one's own via information sheets or with the help of colleagues. Participants describe how the transition was a **grope in the dark for information** that is often missed and the information provided does not correspond to reality.

> Nobody instructed me how the protective equipment was to be used, I had to read it myself via information sheets.
>
> (Participant 37)

Due to lack of information participants experience difficulties in following directives that in some cases, changed several times a day. Quick turns make it difficult to stay up to date, and this is stressful. Time pressure and lack of training mean participants are not ready to care for seriously ill patients. Uncertainty in participants' professional roles increases as COVID-19 is found to be more severe than previously thought.

The change in care is derived from a form of **being in an ambiguous armour**, depicted by difficulties in caring in an environment with a mixture of infected and non-infected patients. Protective equipment is not used consistently, which results in uncertainty about what equipment is required in certain situations. Participants describe the importance of following current hygiene routines. Hygiene is seen as a prerequisite for stopping or reducing infection. However, participants describe uncertainty in the use of masks where the rules for use are changed frequently. Participants find it difficult to know what rules apply each day.

One day there was no suspicion of COVID-19, the next day we would have full equipment.

(Participant 4)

5.2.4 | Regaining vitality together

In an unreal situation and lacking essential knowledge, team cohesion is described as a vital component of coping with this difficult task. The experience of working as a team with the support of colleagues makes it possible to get through the grief and horror of COVID-19 and rejoice over how patients recover and return to home. Balancing the relationship with colleagues (old and new) is decisive and strengthening. Despite the serious consequences of the pandemic, through cooperation and learning in teamwork, new insights are gained on how difficult challenges can be mastered together. This development impacts life in general, now being lived in a new and different dimension. The change in everyday work life is frightening yet framed by **the power of togetherness**.

> With the help of fantastic colleagues, we got the job going well. Lots of tears, laughter, and horror but we worked as a team.
>
> (Participant 19)

Being strong together means being able to show vulnerability and finding space to ventilate emotions. Teamwork is described as significant between departments and different professions where everyone in the same situation helps each other as far as possible. The support of others is made visible through the efforts of society and the organization where food and gifts recognize their work. Participants even describe the change as developing, meaning participants' care challenges provide new knowledge described as an opportunity to **learn together**. Learning means new contacts where the participants get to know people from other departments.

> I have learned new things, made new contacts with people.
>
> (Participant 30)

COVID-19 means change and participants are forced to **reorient in a changed world**. As COVID-19 develops, participants describe how they adapt their lives to the circumstances at work and in everyday life. The participants describe how life changes in a short time and new insights are gained.

> The positive thing about the pandemic is that you appreciate your loved ones and friends even more.
>
> (Participant 33)

Through common experiences, the feeling of appreciating life on a deeper level grows.

5.3 | Quantitative analysis

5.3.1 | Associations between SOC, SCS and PTSD in simple analyses

In simple linear regression analyses, SOC was significantly negatively associated with symptoms of PTSD ($p < .001$). For each unit increase in SOC, symptoms of PTSD decreased by -0.80 units. SOC explained 43.5% of total variation in PTSD symptoms. All subdimensions of SOC had a significant negative association with symptoms of PTSD in simple linear regression analyses ($p < .001$). Furthermore, SCS was significantly associated with symptoms of PTSD ($p = .001$). For each unit increase in SCS, PTSD symptoms decreased by -8.25 units. SCS explained 11.3% of the variation in symptoms of PTSD. For SCS subdimensions, simple linear regression showed higher levels on self-kindness and indicated lower symptoms of PTSD. Subdimensions self-judgement, isolation and overidentification were significantly positively associated with symptoms of PTSD ($p < .001$, $p = .005$ and $p = .001$) respectively. For age and sex, each were significantly associated with PTSD ($p = .014$ and $p = .035$ respectively). Age explained 6% of the variation in symptoms of PTSD, and sex 4%.

5.3.2 | Associations between SOC, SCS and PTSD in multiple analysis

In multiple regression analyses, SOC was significantly associated with PTSD ($p = <.001$) while SCS was not ($p = .226$) adjusted for age, $p = .648$ and for sex $p = .190$. The model explained 46.4% of the total variance in PTSD. SOC and subdimensions comprehensibility and meaningfulness were associated with symptoms of PTSD ($p = .001$ and $p = .038$), respectively, and were the most important predictors in multivariate regression analyses adjusted for age and sex.

Furthermore, subdimension manageability and SCS subdimensions were not significantly associated with PTSD. The model explained 50.7% of the variance in PTSD, see Table 4.

5.4 | Meta-inference of qualitative and quantitative data

Finally, by synthesizing qualitative and quantitative findings one main theme emerged; **When work became a frightening experience in a dehumanized reality.** This reveals how the COVID-19 pandemic entailed crossing a border to an unknown frightening world, characterized by anxiety and loss of control. The main theme consists of four themes, illustrated in Figure 1.

TABLE 4 The association between sense of coherence, self-compassion and symptoms of post-traumatic stress disorder.

	Simple regression analyses			Multiple regression analyses			
	R^2	B	p-value	B	p-value	B	p-value
Sense of coherence	0.435	−0.806	<0.001	−0.817	<0.001		
Comprehensibility[a]	0.384	−1.655	<0.001			−1.441	0.001
Manageability[a]	0.371	−2.104	<0.001			0.270	0.651
Meaningfulness[a]	0.312	−2.278	<0.001			−1.125	0.038
Self-compassion	0.113	−8.258	0.001	3.223	0.226		
Self-kindness[b]	0.040	−4.110	0.055			3.728	0.216
Self-judgement[b]	0.126	6.806	<0.001			2.491	0.424
Common humanity[b]	0.005	−1.446	0.487			0.071	0.974
Isolation[b]	0.082	5.004	0.005			−1.674	0.511
Mindfulness[b]	0.035	−4.333	0.069			−2.064	0.496
Over-identification[b]	0.117	6.173	0.001			−2.106	0.410
Age	0.062	−0.355	0.014	−0.053	0.648	−0.045	0.734
Sex[c]	0.046	−10.558	0.035	−4.909	0.190	−4.822	0.217
				R^2	0.464	R^2	0.507

Note: p-value <.005 is considered significant.

Abbreviations: B, Unstandardized coefficients; R^2, R square.

[a]Subdimensions of Sense of Coherence (SOC).

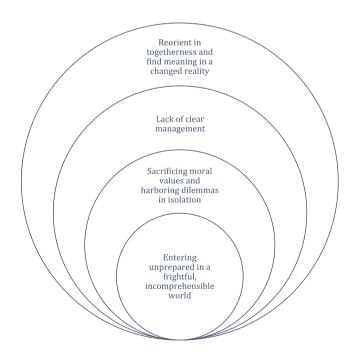[b]Subdimensions of Self Compassion (SCS).

[c]Reference women.

FIGURE 1 Synthesized qualitative/quantitative results—meta-inference. Main theme: When work became a frightening experience in a dehumanized reality.

The theme **entering unprepared in a frightful, incomprehensible world** derives from the qualitative category 'Working in a dehumanized world of COVID' and subcategories *caught in a time of fear and anxiety*, *situations of involuntariness*, *loss of control* and *abandoned in a frightening world*. This theme comprises feelings of abandonment, loneliness and anxiety connected to quantitative findings of less comprehensibility (subdimension within SOC) being a significant predictor for a higher level of stress (symptoms of PTSD) in multiple regression analyses. Less manageability was significantly associated with higher symptoms of PTSD and for each unit that manageability increased; symptoms of PTSD decreased. Low manageability connected to narratives of being forced into a new incomprehensible work situation without education, encountering unknown work tasks and the fear of being responsible in unmanageable situations.

Hard situations at work entailed persistent feelings of guilt and shame in relation to oneself, patients and colleagues. The theme **sacrificing moral values and harbouring dilemmas in isolation** illuminates feelings of disapproval, how participants judged themselves, felt guilt and shame in relation to colleagues. Agony of deviating from expressing meaningful caring acts in life and death abided with making sacrifices and feeling lonely. The qualitative category 'Living in betrayal of one's own conscience' and subcategories *carry moral burdens*, *engage in unworthy acts* and *forsake the private life* were connected to comprehensibility and meaningfulness which were the most important predictors for PTSD in multiple regression analysis. The subdimension isolation within SCS was significantly positively associated with PTSD only in simple regression analyses. Higher scores indicated more symptoms of PTSD.

The theme **lack of clear management** describes being forced into self-learning and being unprotected in the middle of contradicting and amended directives foremost concerning personal protective equipment. This was illustrated in qualitative findings by the category 'Lack of structure in a chaotic time' and subcategories *grope in*

the dark for information and *being in an ambiguous armour*. This was confirmed in quantitative findings by the importance of comprehensibility and meaningfulness as important predictors for PTSD in multiple regression analyses. Low manageability was significantly associated with higher symptoms of PTSD.

Subsequently, and in togetherness the changed reality became more comprehensible and manageable, visible in the theme **reorient in togetherness and find meaning in a changed reality** This was synthesized from qualitative results in the category 'Regaining vitality together' and subcategories *the power of togetherness*, *learn together* and *reorient in a changed world* connecting to quantitative results of a higher level of meaningfulness and manageability significantly associated with lower PTSD symptoms.

The entire meta-inference is available in Table S1. See example of the meta-inference process in Table 5.

6 | DISCUSSION

The findings in this study shed light on HCWs' common experiences of working in a dehumanized reality when facing the COVID-19 emergency. In the meta-inferenced results from qualitative and quantitative data, we conclude HCWs were exposed to and forced to deal with trauma during the COVID-19 pandemic exacerbating the risk of developing severe symptoms of stress. Experiences of stress came from both internal and external stressors. Strong quotes reveal a frightening experience of the change in work where HCWs, without preparation, faced tasks that differed from their own competence with risk of patients' lives and own health. Having to perform beyond one's control, entailing emotional and physical exhaustion while facing redeployment and difficult, stressful and unethical situations depleted HCWs bodily resources. This relates to systematic reviews highlighting the increased risk of HCWs developing PTSD when working during the COVID-19 pandemic (Carmassi et al., 2020, 2022). Our results confirm the lack of structure in this chaotic time entailing stress and less comprehensibility. This calls for demands in advanced healthcare to accommodate reasonable working conditions and supports previous findings that the COVID-19 pandemic had a negative impact on stress of conscience, foremost in close patient care situations (Nilsson et al., 2022). SOC has previously been found to correlate positively to work engagement and to correlate negatively to psychological distress (Navarro Prados et al., 2022). It seems clear to us that engagement with patients in matters of life-and-death leaving little margin for errors. Being forced to take short cuts in practice or leave caring actions undone due to a stressful work environment seems to be of utmost importance to avoid. We suggest SOC as an important resilience factor thus we also found higher levels of self-kindness being significantly associated with lower symptoms of PTSD. However, there are to our knowledge no validated interventions covering SOC and work-engagement to prevent stress and symptoms of PTSD in HCWs who performed during the pandemic.

By meta-inferenced findings, we found self-kindness as an important resource in burdensome situations. This connects to pre-pandemic research (Wiklund Gustin, 2017) pointing to self-compassion as the provider of safety and self-understanding enabling to control our reactions in situations requiring the presence in other peoples' suffering. Our study suggests coexisting mixed emotions such as pride, anger, guilt, satisfaction and sadness. This awakens the question of theory concerning coexisting mixed emotions. Reconciliation in contradictory situations has been investigated and found to be connected to the ability to accept duality (Williams & Aaker, 2002). However, when addressing the concept of duality, awareness of the difference between judging and reflecting needs to be raised. To reflect upon ones' performances, feeling guilty when ethical values are violated should not be automatically translated into self-criticism (Wiklund Gustin, 2017). This study confirms that feelings of guilt and shame in relation to oneself, patients and colleagues can coexist even in togetherness adding to the complexity of the phenomenon of self-compassion. This needs to be accounted for when tailoring supportive interventions in the future.

Despite the presence of a traumatic reality in HCWs' everyday work, we found determination and willingness to contribute during the pandemic confirmed in the relevant association between symptoms of PTSD and SOC subdimensions, comprehensibility and meaningfulness. This connects to previous research suggesting SOC as a tool might be a promising approach (Masanotti et al., 2020; Schäfer et al., 2020). Thus, our data confirm that using SOC might be a way forward in the systematic approach preventing negative health determinants in HCWs, hence more research is needed. A recommendation for continued research is that in the event of pandemics, the organization must be aware that the difficult work environment situation may risk affecting (weakening) employees' SOC and contribute to an increased risk of symptoms of PTSD. In line with Hill et al. (2022) we suggest mediation and interaction analysis within PTSD when aiming to perform preventing strategies in the future.

In summary, pandemics caused by infectious diseases are not a new phenomenon, not even in modern times. There has been considerable interest in exploring and conceptualizing the common experience of HCWs caring for patients under changed circumstances. In the 21st century, notable infectious outbreaks such as severe acute respiratory syndrome (SARS) epidemic, H1N1 influenza A pandemic, the middle east respiratory syndrome (MERS) outbreak and the Ebola virus disease (EVD) have engaged researchers throughout the world. Research has pointed out uncertainty, adapting to change, commitment, sacrifice and resilience as characteristic of HCWs' experiences (Chahley et al., 2021). Research also reveals HCWs and individuals recovering from COVID-19 experience 'social stigma' in line with previous outbreaks of SARS and EVD, that is, social rejection or exclusion in social settings (Muhidin et al., 2020).

There is a risk that countries that suffered a low impact of the COVID-19 pandemic emergency are excluded in research covering the mental health burden on HCWs. We, however, emphasize that a considerable number of HCWs reported clinical depressive and PTSD symptoms in these countries too. From a global perspective,

TABLE 5 Examples of combining qualitative and quantitative data in the mixed-methods analyses—meta inference.

Example quote	Qualitative results category/subcategory	Quantitative results	Synthesis	Theme	Main theme
To be terrified of being infected and of our patients becoming infected eats me up and I feel that I have distanced myself from my colleagues. I feel completely exhausted and strongly consider quitting work in healthcare.	Working in a dehumanized world of COVID—caught in a time of fear and anxiety	Less manageability was significant associated with symptoms of post-traumatic stress disorder (PTSD) and for each unit increased manageability, symptoms of PTSD decreased in **simple** regression analyses. The subdimensions over-identification and isolation within self-compassion scale was significantly positively associated with higher level of stress in **simple** regression analyses.	Be captured and carried away by fear and separated from others in frightening times. To experience exhaustion and wanting out.	Entering unprepared int a frightful, incomprehensible world	When work became a frightening experience in a dehumanized reality
The absolute hardest thing was to put the deceased in body bags without making them nice for a final farewell and that some due to high workload had to die alone.	Living in betrayal of one's own conscience—engage in unworthy caring acts	Comprehensibility and meaningfulness were the most important predictors for PTSD in multivariate **multiple** regression analyses.	Agony of deviating from expressing meaningful caring acts in life and death.	Sacrificing moral values and harbouring dilemmas in isolation	
Nobody instructed me how the protective equipment was to be used, I had to read it myself via information sheets.	Lack of structure in a chaotic time—grope in the dark for information	Comprehensibility and meaningfulness were the most important predictors for PTSD in multivariate **multiple** regression analyses.	Being forced to self-learning.	Lack of clear management	
With the help of fantastic colleagues, we got the job going really well. Lots of tears, laughter and horror but we worked as a team.	Regaining vitality together— the power of togetherness	Comprehensibility and meaningfulness were the most important predictors for PTSD in **multiple** regression analyses.	Regain meaning and learn together.	Reorient in togetherness and find meaning in a changed reality	

Note: Inspiration by: https://apastyle.apa.org/style-grammar-guidelines/tables-figures/sample-tables#mixed.

Sweden has not faced the worst effects of the pandemic and the Swedish government on the advice of The Public Health Agency, made some strategic decisions that differed from many other countries'. Restrictions in Sweden were primarily based on voluntary compliance, evidence and proportionality, persistence and acceptance. There was, for example, voluntarily distancing to avoid transmission, schools remained open and only a few recommendations to use masks in public (SOU 2022:10). Hence, in line with many other countries, visitor restrictions at hospitals and nursing homes were applied (Hugelius et al., 2021). Comparing our results to HCWs' experiences in other countries where there was a more drastic closure of society needs to be addressed with precaution. On the other hand, our findings show the traumatic experience in HCWs despite issues of quarantine and isolation. With previous high suicide rates among nurses (Davidson et al., 2020) this adds to the burden caused by the COVID-19 pandemic and increases the urgent need for knowledge and interventions (Crocker et al., 2023).

6.1 | Strengths and limitations of the work

There are several limitations that need to be taken in consideration. First, we engaged a small number of HCWs and a larger sample representing multiple sites from different regions is necessary to better understand the experiences of frontline HCWs. Due to organizational factors, physiotherapists and midwives working in these temporary ICUs were unfortunately not eligible for inclusion. However, by addressing all HCWs at the medical section, there was an effort to obtain broad sampling with rich and varied descriptions (Graneheim et al., 2017), even though nurses were in the majority (53.1%).

Second, to measure stress, we used the DSM-5, previously and commonly used as an effective tool for measuring symptoms of PTSD. A 5–10-point change represents reliable change (i.e. change not due to change) and a 10- to 20-point change represents clinically significant change (Blevins et al., 2015). Our intention was to explore experiences of stress, not assess PTSD, and we acknowledge that not everybody exposed to stress develops PTSD symptoms.

One can also argue that further analysis between different professionals might add clarifying results. More importantly, longitudinal studies to confirm or reject causality need to be conducted. There to, issues of transferability must be addressed with the concept of interpretation and its individuality in mind meaning there are limitations in applying our findings in other settings. However, to strengthen the transferability of the findings, we have chosen to present the quantitative results by both simple and multiple regressions. To further outline transparency, there is a risk of transferability issues due to non-response bias in free text answers/total questionnaire (49%).

To obtain trustworthiness for the qualitative data, we emphasize that lived experiences consist of essential meanings as they are interpreted. Thus, the authors' pre-understandings should be given acknowledgement and findings ought to be addressed as a

contribution of possible meanings, not striving towards 'the truth'. Thus, the nature of interpretation could mean limited transferability of the findings in other settings. Another limitation of the study could be the random selection of eligible participants (Leech & Onwuegbuzie, 2010) and using written data from the open-ended questions rather than in-depth interviews. Thereto, we acknowledge the ontological and epistemological differences between the two methods applied in this study united in the overarching paradigm. However, we conclude that applying a fully mixed-methods design helped us to answer the research questions in this study more than only using qualitative or quantitative methods would (Leech & Onwuegbuzie, 2009). Our findings therefore might make an important contribution to the vast majority of studies approaching data either from a qualitative or quantitative approach. The identified gap in literature added to the rationale and maximal interpretations of the findings were possible by following the 13 steps of mixed-methods research as suggested by Leech and Onwuegbuzie (2010). However, mixed-methods paradigm is still relatively unknown and to select the optimal mixed-methods designs can be a confusing endeavour given the plethora of approaches. Nonetheless, we anticipate that our study will encourage researchers to apply fully mixed methods within the area of stress and coping (Leech et al., 2011; O'Cathain et al., 2008). By being transparent throughout the research process in this mixed-methods study, we hope to have justified our contribution to enhance quality within mixed-methods research (Irvine et al., 2020; Leech & Onwuegbuzie, 2010; O'Cathain et al., 2008).

Internal, external and measurement validity was undertaken using SPSS and by confirming the results with a statistician. Moving forward, the clinical significance of self-kindness, common humanities and mindfulness and decreased symptoms of PTSD needs to be investigated further by both qualitative and quantitative measures alongside research on the impact of having to carry out work against one's conscience and having to carry moral burdens.

The internal correlations among subdimensions in SOC and SCS complicate the ability to definitively rule out or rule in any subgroups in multiple regressions. Although, we emphasize SOC as a significant variable over SCS, as it retains its significance in the multiple regression model (while SCS is not) adjusted for age, gender and each other. We consider that this analysis has more weight compared to the regression with all subdimensions. The results of the subdimensions should be considered as exploratory, therefore caution should be taken when interpreting these findings.

6.2 | Recommendations for further research

From a global perspective, the long-term effects of the COVID-19 pandemic have not been studied and our findings promote further longitudinal studies in larger projects. We encourage researchers to consider a mixed-methods design in further studies as methodological compatibility enables comprehensive and useful conclusions (Mayoh & Onwuegbuzie, 2015).

6.3 | Implications for policy and practice

This study demonstrates how frightening experiences, organizational shortcomings and the connection between lower SOC and increased risk of developing symptoms of PTSD relate and might guide future interventions on how vitality can be regained in times of crisis.

7 | CONCLUSION

Forcing oneself to perform beyond one's limit, sacrificing moral values and lacking management was a traumatic experience to HCWs. Reorienting as a way of coping was possible in togetherness with colleagues. Having the prerequisites to bestow care according to core values seems pivotal when facing extreme situations as the COVID-19 pandemic. We argue the pivotal importance of being able to work according to core ethical values to endure stressors. Having to violate them seems to adversely affect health negatively, and long-lasting negative consequences risk affect health negatively. This adds to the urgency of implementing appropriate interventions to meet the needs among those who took on a frontline role during the pandemic and to prevent mental health illness in future crisis.

Our findings on HCWs' traumatic experiences shown by the connection between lower SOC and higher risk of developing symptoms of PTSD demonstrate potential opportunities for supportive interventions in the future. Our synthesized results imply that by highlighting the power of togetherness, reflective learning in togetherness and being able to reorient in the changed world, vitality can be regained in times of crisis. Consequently, future research needs to explore the ethical dimensions of stress as a phenomenon within caring for patients. This calls for a more comprehensive discourse on the dimensions of caring for patients and the roles of caring professionals. We anticipate our findings can contribute to conceptualize HCWs' experiences and empower supportive interventions to reduce the risk of trauma in future emergency confrontations.

CONFLICT OF INTEREST STATEMENT

No conflict of interest has been declared by the authors.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.