# Coping with psychological distress during COVID-19: A Cautionary note of self-criticalness and personal resilience among healthcare workers

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## Abstract

Purpose: The COVID-19 pandemic resulted in immense pressure ~~for~~ on healthcare workers (HCWs) and healthcare systems worldwide. Th~~e current multi-centre evaluation sought to explore the association between coping behaviours and levels of psychological distress among~~ ~~is rapid multi-centre cross-sectional evaluation assessed psychological distress and coping behaviours in~~ HCWs ~~during~~ inworking during the initial onset ~~the acute~~ of phase of COVID-19.

Methods: Between April to July 2020 HCWs at three urban hospitals in England were invited to complete an online survey measuring personal and professional characteristics, psychological distress and coping. A principal component analysis (PCA) identified components of coping ~~among HCWs~~ and structural equation modelling (SEM) was used to test the relationship between components of coping and psychological distress.

Findings: A total of 2,254 HCWs participated, (77% female; 67% white; 66% in clinical roles). Three components for coping were retained in the PCA analysis: ~~active~~ external strategies~~coping~~; ~~adaptive~~ internal strategies~~coping~~; and ~~maladaptive~~ self-criticalness/substance use~~coping~~. SEM indicated that ~~adaptive~~ internally based coping was associated with lower levels of psychological distress, whereas ~~active~~ externally based coping and self-criticalness ~~was~~ were associated with greater psychological distress. The final model accounted for 35% of the variance in psychological distress.

Originality & Practical Implications:
~~Originality:~~ This multi-centre evaluation provides unique insight into the level of psychological distress among HCWs during the initial onset of the COVID-19 pandemic (2020) and associated coping strategies. Addressing self-criticalness and supporting cognitive-based internal ~~ly adaptive~~ coping strategies among HCWs may protect against prolonged exposure to psychological distress. Findings highlights the importance of developing a culture of professional resilience among this vital workforce as a whole rather than placing pressure on an individual's personal resilience.

~~Our study collected data in real time from staff working across three hospitals during the acute phase ojmf the pandemic. Addressing self-criticalness and supporting cognitive reframing among HCWs may protect against prolonged exposure to psychological distress. Active based coping strategies, traditionally associated with reductions in psychological distress, may be problematic in this context due to a lack of control and available solutions. Findings also highlight the importance of~~

developing professional resilience among this vital workforce as a whole rather than putting pressure on individuals personal resilience.

Continuity & Resilience Review

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# ~~Literature Review~~ Introduction

## *Background*

Working in health care is a high pressure environment, which is compounded in times of crisis. The COVID-19 pandemic put a spotlight on ~~provides a critical blueprint for the ways in which~~how health care workers (HCWs) are affected by additional acute stress and what tools are needed to protect the welfare of this vital workforce. Historically, viral pandemics have been shown to have chronic effects on HCWs' physical and mental health (Brooks *et al.*, 2018; McAlonan *et al.*, 2007). Even in the early stages of the COVID-19 pandemic, global healthcare services exhibited warning signs ~~for~~ of higher psychological distress compared to past pandemics, such as the 2003 outbreak of severe acute respiratory syndrome (SARS) or outbreaks of influenza (Barello *et al.*, 2020). To appropriately support HCWs, an understanding of their psychological well-being and related coping strategies utilized is needed when faced with additional stress.

## *Psychological Distress*

Psychological distress is a state categorised by emotional suffering which is associated with symptoms of depression, anxiety and burnout often related to high pressure or work demands, poor support and perceived lack of control over a situation (Marchand *et al.*, 2004). While psychological distress is often thought to be transient, it can have persistent long-term impacts when left unresolved (Horwitz, 2007). Research from SARS ~~has shown~~highlighted that even 2-3 years after the resolution of the pandemic, HCWs who experienced high psychological distress were more likely to exhibit higher rates of affective disorders, problematic work behaviours, decreased quality of care and substance misuse (Maunder e*t al*., 2008; Taylor *et al*., 2007). Understanding correlates of psychological distress within the current emergency climate will therefore provide evidence to support the on-going development of interventions for HCWs.

Early COVID-19 research ~~Recent evidence~~ has highlighted that thi~~se~~ pandemic has had a substantial impact on HCW well-being (Couarraze *et al*., 2021). Evidence also suggests that ~~prior to~~before the pandemic the healthcare workforce was in a precarious state, ~~and~~ already suffering from a discontented staff, low morale and unstable infrastructure (Black, 2013). Records now show there is a mass migration of HCWs from their roles following the first year of the pandemic largely due to poor HCW wellbeing (RCN, 2022). Public focus on the National Healthcare Service's (NHS) strategies for supporting HCWs during this time has aggrandized, and central to this rhetoric is the assumption of ~~HCW's~~ HCWs' resilience when it comes to dealing with the stressors of their roles. This public discourse often sanctifies HCWs as 'angels' or 'heroes', but potentially in doing so creates a sense of being 'super-

human' and adds to the pressure for these individuals to perform their duty regardless of ~~the cost or~~ their ~~own personal~~ fears or the cost to their well-being (Davey *et al*., 2022; Margantini *et al*., 2020; Stokes-Parish *et al*., 2020). This emphasis on duty can lead to HCWs not prioritising their ~~own~~ well-being in times of crisis (Davey *et al*., 2022). At the onset of the pandemic, a focus was placed on the i. ~~In particular~~ndividual ~~, the~~ resilience of HCWs and how ~~of the workforce and their~~they were ~~ability~~ able to cope with a crisis ~~became a topic of hyper-focus during the pandemic~~, yet little emphasis was placed on the systemic challenges. ~~.~~

*Resilience and ~~coping~~ Coping in a ~~pandemic~~ Pandemic*

Resilience refers to actions intended to secure resources required for sustainability in a stressed environment (Ungar, 2018). Personal resilience describes the capacity ~~for~~ of an induvial to cope with a crisis and quickly return to previous levels of functioning with as little negative impact as possible (Rosen et al, 2020). Professional resilience on the other hand refers to the capacity ~~for~~ of an individual to thrive in a demanding work environment. This encompasses their willingness to act in difficult situations which largely depends on the resources and support available to them at the time (Connelly *et al*., 2022). Resilience has been widely promoted as a key factor for mediating HCW distress ~~in the past~~ (Rosen *et al*., 2020).

There was a sense of national heroism promoted in the UK during COVID-19, which fell on the shoulders of the NHS to move forward with their duty despite the unknown characteristics of an infectious and fatal virus (BPS, 2020). This further compounds the complicated discourse which surrounds the identity of duty for HCWs during a crisis (Davey *et al*., 2022; Margantini *et al*., 2020; Stokes-Parish *et al*., 2020). Central components of resilience remain under debate, particularly when applied to HCWs' experiences. Some define it as an individual trait which implies it has a limited capacity in some, and may not be present in others, while other literature promotes resilience as an adaptive and dynamic process underpinned by organisational support and resources (Davey *et al*., 2022). Healthcare organisations have traditionally focused on personal resilience rather than professional resilience as the responsibility of the individual, laying the onus on HCWs rather than addressing occupational stresses such as poorly executed redeployment, understaffing and the emotional burdens of their workloads (Connelly *et al*., 2022; Treynor, 2018). However, this may also send the message that an inability to cope with a crisis is the fault of an individual, rather than the lack of support they are afforded within their system, and in turn, may play on the engrained stigma surrounding vulnerability within the work culture of healthcare.

Considerable variability exists in how individuals cope with ~~crisis~~crises. Coping is a process used to manage a range of ~~different internal and external~~ stressors,

manifesting in a form of a strategy intended to help deal with painful or difficult emotions (Lazarus and Folkman, 1984). Psychological distress is likely to persist, or even worsen when individuals struggle to employ successful coping strategies. Coping behaviours can be internal (e.g., cognitive), or externally based (e.g., engagement with others). Several coping strategies are considered adaptive, ~~, such as active based problem solving,~~ which can help in disassembling high levels of distress often associated with the HCW role (Garcia *et al*., 2018). ~~Similarly, i~~ However some coping strategies, although well intended, are often counterproductive in the longer term, and can lead to additional psychological distress (Thompson *et al*., 2010).

Coping mechanisms have been identified as a crucial component for HCW resilience during past pandemics. During the SARS~~n previous~~ pandemic~~s~~, HCWs who were able to employ ~~approach~~internal, cognitively- based ~~styles of~~ coping strategies (e.g., ~~,~~ ~~such as~~ positive reframing) ~~, dispositional resilience and flexibility in their thinking~~ were shown to be less adversely affected in stressful situations (Connor and Davidson, 2003). Whereas ~~Whereas maladaptive coping strategies are those that, although sometimes well intended, are often counterproductive in the longer term, and can lead to additional psychological distress (Thompson *et al*., 2010).~~ In particular, self-criticism is a form of maladaptive coping, in which attributions of a stressful occurrence are directed inwards and painful thoughts and feelings about how past actions led to these events elicit feelings of regret, failure, guilt and disgust (Stroebe *et al*., 2014; Maunder *et al*., 2006). ~~Investigations into coping during the SARS pandemic showed that maladaptive coping mechanisms, such as a~~avoidant coping (i.e., disengaging) and self-criticism were shown to be harmful to the well-being of HCWs and ~~was~~ were associated with long-term negative effects following the resolution of the SARS pandemic (Brooks *et al*., 2018; McAlonan *et al*., 2007; Maunder *et al*., 2006).

~~Coping mechanisms have been identified as a crucial component for HCW resilience during the current and past pandemics. A cross sectional study of HCW wellbeing and quality of life (QoL) during multiple time points during COVID-19 revealed that the coping mechanisms employed in the first wave had a direct impact on ability cope with subsequent waves (Gillen *et al*., 2022). Employing approach-based coping (acceptance, reframing) was positively associated with HCW wellbeing and acted as a protective factor during the second wave. On the other hand, use of negative or avoidant coping methods such as self-blame were shown to greatly decrease ability of HCW to cope with the stress of the pandemic in the second wave. The study also found that there was an increase in the use of negative and avoidant strategies as the pandemic continued, indicating that some HCW strategies were becoming overwhelmed by the process (Gillen *et al*., 2022). This may also indicate that those utilising coping mechanisms such as active problem solving were struggling to solve an unsolvable issue and becoming disillusioned with their work, a trait commonly~~

~~associated with burn out (Byrne, 1991). However, finding meaning in the role of a caring professional is generally a motivating factor for HCWs and associated with approach-based coping which remained protective from one wave to the other (Davey *et al.*, 2022).~~

~~Current literature presents an unoptimistic picture of the healthcare system during the pandemic. The changes brought on by the pandemic are likely to be felt for some time yet, meaning HCW wellbeing is now in crisis (Charles and Ewbank, 2021). The rhetoric around HCW resilience and coping clearly needs to be adapted if we are to support HCWs to navigate a system in peril. Despite advances in inoculation, COVID-19 shows no sign of resolution, and in such has become the new normal in healthcare. There is also now the added pressure of HCW's returning to business as usual in this new normal and navigating both the pressures brought on by the virus but also the increase in pressure on the system in other areas such as extended waiting lists and an influx of patients (Gillen *et al.*, 2022).~~

*Purpose*
~~The current multi-centre evaluation sought to explore the association between coping behaviours and levels of **psychological** distress among HCWs in the initial onset of COVID-19.~~

The purpose of this evaluation was to explore HCWs' ~~coping behaviours and~~ levels of psychological distress and associated coping behaviours during the onset of a global pandemic ~~across multiple centres~~ in order to ~~better understand how best toadvise~~ support efforts across multiple hospitals. ~~HCWs adapt to this new normal.~~ Based on previous research (Maunder *et al*., 2008) and theory (Lazarus and Folkman, 1984) it was hypothesised that traditionally ~~adaptive~~ adaptive-based components of coping ~~strategies~~ (e.g., engaging in support, cognitive reframing) would be ~~positively~~ associated with lower levels of psychological distress and that traditionally problematic ~~maladaptive~~ coping strategies (e.g., self-criticalness, avoidance) would be ~~negatively~~ associated with higher levels of psychological distress ~~(Lazarus and Folkman, 1984; Maunder *et al*., 2008)~~.

**Methods**

*Procedures and participants*
Following the onset of the global pandemic, three hospitals in [location following peer review] collaborated to evaluate staff mental health. HCWs were invited to participate through a link provided in hospital wide communication emails and QR codes displayed on posters in staff respite areas. Interested HCWs anonymously accessed the bespoke survey via an online survey platform (Qualtrics XM, USA) between April and July 2020.

Data were collected in accordance with the UK ~~framework~~ Framework for Health and Social Care Research (HRA, 2017). The Health Research Authority (HRA) has the Research Ethics Service as one of its core functions and they determined the project was exempt from the need to obtain approval from an NHS Research Ethics Committee (https://www.hra.nhs.uk/about-us/committees-and-services/res-and-recs/). The purpose of this evaluation was clearly outlined to potential participants and contact details were provided should there be additional questions requiring clarification. Participants were informed that their completion and submission of the survey was implicit of consent and that responses would be kept confidential and reported anonymously.

*Data collection*

The survey was an ~~investigator~~ investigator-designed self-report questionnaire containing validated measures adapted for the evaluation. Personal (age, gender, ethnicity) and professional (hospital of employment, role, years worked) characteristics were self-reported. Due to the intensity of the COVID-19 climate in the spring of 2020, it was essential that this evaluation ~~was~~ be brief, thus items were chosen from validated measures based on appropriateness within the COVID-19 context.

~~Personal and professional characteristics~~
~~Personal (age, gender, ethnicity) and professional (hospital of employment, role, years worked) characteristics were self-reported.~~

*Coping*

Items from the Brief COPE, a multi-dimensional measure of strategies used in response to stressors were adapted to assess a range of coping behaviours (Carver, 1997). A total of ~~nine9~~ items were chosen which assessed the following coping strategies: self-distraction, substance use, self-criticism, active coping, emotional support, religion, use of informational support, positive reframing, and acceptance. Items used in this evaluation were chosen based on appropriateness within the pandemic context (e.g. behavioural restrictions) and theoretical underpinnings (BPS, 2020; Lazarus and Folkman, 1984). Respondents were asked to what extent they engaged with each strategy ranging from one (I haven't been doing this at all) to four (I've been doing this a lot). The Brief COPE has ~~been widely~~ shown validity and reliability~~used in~~ use among the general population (Muller and Spitz, 2003), healthcare professionals (Rahman *et al*, 2021), and during past pandemics (Yeung and Fung, 2007).

The Brief COPE was developed ~~with the intention of exploring~~to explore individual coping strategies (e.g. self-criticism) and should items require reduction (i.e. to use

factors as predictors), it is the recommendation of the developers to explore ~~second~~ second-order factors within one's ~~own~~ data via a principle component analysis (PCA) given that different samples exhibit different patterns of relations (Carver, 1997). Historically, there has been a lack of transparency on how items from this measure have been used and related justification (theoretically or conceptually) (Solberg *et al*, 2021).

*Psychological distress*
The construct of psychological distress, inclusive of symptoms of anxiety and depression, was assessed using the Kessler-10 (K10) (Kessler *et al*, 2003). This widely used, validated 10-item measure assesses indicators of psychological distress in the past 7 days on a five-point Likert scale ranging from one (none of the time) ~~through~~ to five (all of the time). The maximum score, which indicates high psychological distress is 50 whereas the lowest score (10) indicates an absence of psychological distress. Additional categorizations have been utilized: low distress (10-15); moderate distress (16-21); high distress (22-29), and very high distress (30-50) (Kessler *et al*, 2003). The K-10 has shown reliability and validity within samples of HCWs (Peisah et al., 2009)

*Analysis*
Data were analysed in R (Version 3.6.1). Descriptive statistics (means, standard deviations, or percentages) w~~h~~ere calculated followed by PCA with varimax rotation to establish components of coping among the sample. It was hypothesised a minimum of two components would immerge based on traditionally adaptive and maladaptive based coping strategies. Lastly, structural equation modelling (SEM) with maximum likelihood estimation was used to test associations among components of coping derived from the PCA and psychological distress. It was hypothesized that both the internal and external-based coping strategies would be negatively associated with psychological distress and the self-criticalness/substance use would be positively associated with psychological distress.

Using a two-step structural equation model (SEM) method, a confirmatory factor analysis was first used to assess the measurement model and was followed by an assessment of the hypothesised model (Anderson and Gerbing, 1988). This approach first established the fit of the measurement model by examining the relation of the observed variables (~~ie.g.,~~e., ~~active~~ external coping; internal coping; self-criticalness/substance use) to their underlying constructs (i.e., ~~e.g.,~~ emotional support, taking action, ~~and help~~ help-seeking; acceptance, positive reframing). Secondly, this approach established the fit of the structural model by comparing the

hypothesised variance-covariance matrix to the sample variance-covariance matrix. If the two variance-covariance matrices are closely matched, implied by fit indices: Tuker-Lewis index (TLI), comparative fit index (CFI), standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), the conclusion is that the hypothesised model approximates the data well (March *et al.* 2004). To test magnitude and statistical significance, 95% confidence intervals (CI) derived from 5,000 bootstrap iterations were calculated.

## Results

A total of 2,254 HCWs provided data from three urban hospitals. Table 1 displays personal and professional characteristics. Respondents were predominantly white (76%), female (77%), and had been working in the organisation for less than 6 years , working in a clinical role (66%). Overall, high levels of psychological distress (M = 21.7; SD = 7.5) were observed in respondents, with 22% of respondents indicating low levels of psychological distress, 35% moderate, 27% high, and 16% very high.

[Table 1]

*PCA: Coping*
To confirm that it was appropriate to conduct PCA on the correlation matrix, we visually inspected the anti-correlation matrix. Second, to determine how many components should be retained (to summarize the variation in the variables), we used the Kaiser criterion (value > 1) and inspected the screen plot which suggested that three factors best explained the interrelationship between items in our data. Based on these results and discussions with the evaluation team, a 3-component solution was forced. Questions specific to active coping, emotional support, and use of informational support loaded highly on the first component, which was assigned the label 'active external coping'. Questions specific to positive reframing and acceptance loaded on the second component, which was labelled 'adaptive internal coping'. Lastly, questions measuring self-criticism and substance use loaded on the third component, representing 'maladaptive coping'. Items which assessed religion and self-distraction were removed as their factor loadings were below the cut-off (<0.04) (Tabachnick & Fidell, 2013).

*SEM: Coping and psychological distress*
The measurement model consisted of four inter-correlated latent variables. Based on the results of the PCA, the factor labelled active external coping had three indicators, adaptive internal coping factor had two indicators, and maladaptive self-criticalness/substance usecoping had those two indicators. The 10 validated items from the K10measuring psychological distress were used as the measured variables for represented the factor ofthe psychological distress factor. Age, gender, and total

number of years working in the organisation were included in the model as covariates.

All standardised factor loadings for the measured variables on their latent factors were significant. Furthermore, psychological distress as a latent factor demonstrated acceptable composite reliability ($\rho$ = .88). The measurement model exhibited an acceptable fit to the data: $\chi^2$ = 1082.78 (133), p < .05; TLI = .90; CFI = .92; SRMR = .04; RMSEA = .07 (90% CI = .06 to .07). Error-free correlations (see Table 2) between latent factors were statistically significant, ~~with the exception of adaptive coping not correlating with maladaptive coping and~~ rang~~ed~~ing in magnitude from small-to-large according to conventional effect size criteria (i.e., small $\geqslant$ .10, moderate $\geqslant$ .30, large $\geqslant$ .50; Cohen, 1988), except for internal coping which did not correlate with self-criticalness/substance use coping.

[Table 2]

A model with direct paths from three unique coping factors to psychological distress was preferred based on fit indexes (see Figure 1). Fit indexes from this model suggested that this model possessed an acceptable fit to the data: TLI = .90; CFI = .92; SRMR = .04; RMSEA = .07. As hypothesised, internal coping negatively predicted psychological distress (b = -.28, B = -.2, 95% CI = -.35, -.2) and Self-criticalness (following the removal of substance use) positively predicted psychological distress (b = .3, B = .49, 95% CI = .26,.33). However, ~~Active~~ external coping positively predicted psychological distress (b = .09, B = .12, 95% CI = .05,.14). ~~Whereas adaptive coping negatively predicted psychological distress (b = -.28, B = -.2, 95% CI = -.35, -.2). Self-criticalness, as a maladaptive coping component following the removal of substance use, positively predicted psychological distress (b = .3, B = .49, 95% CI = .26,.33).~~ This model accounted for 35% of the variance in psychological distress.

[Figure 1]

**Discussion**

This multi-centre analysis explored HCWs coping strategies and how they related to psychological distress during a crisis. Results partially supported our hypotheses, ~~where~~ with internal based coping strategies and self-criticalness emerging as

components of coping, an adaptive and maladaptive component of coping emerged among HCWs, which were directly associated with levels of psychological distress. A third component of coping was identified that captured active external-based coping strategies, historically thought to be adaptive, which was associated with higher levels of distress among HCWs. Specific to personal and professional factors, only age was retained in the final model which was negatively associated with distress.

These findings mirror reports regarding age, work experience and psychological distress among HCWs during crises (Arafa *et al*., 2021; Blekas *et al*., 2020; Han *et al*., 2020). Age was shown to have a small but significant negative relationship with distress. However, work experience was not related. It is important to recognise that the early weeks of the pandemic may have still exposed older, more experienced HCWs to distressing situations, thus highlighting the lack of consistency in reports specific to these factors. Likewise, while gender is associated with psychological distress, often those considered most at risk are nurses (Alan *et al*., 2021; Holton *et al*.,2021). The fact that nurses are predominately female in this sample means that this may have disproportionately signalled out female HCWs as more vulnerable to psychological distress, when actually it is the role of the nurse, regardless of gender, which exposes HCWs to more stressful stimuli (Sirois and Owens, 2021). Studies indicate that men are more reluctant to admit feelings of distress, which may further influence this profile (Staiger *et al*., 2020). However, there is also evidence that men and women experience stress differently and biologically women may be more prone to experiencing sadness and anxiety (Chaplin *et al*., 2008). As there is a significant amount of research on emergency situations which continues to highlight the rhetoric of female HCWs being likely to report psychological ill health, we should remain cognisant of this when considering staff support (Ahmed *et al*., 2020; Chaplin *et al*., 2008; Hong *et al*., 2020)

Adaptive Internal based coping was shown to have a significant relationship with lower levels of psychological distress. A study of HCW well-being and quality of life (QoL) during multiple time points during COVID-19 revealed that the internal based coping mechanisms employed in the first wave had a direct impact on the ability to cope with subsequent waves (Gillen *et al*., 2022). Those who were able to shift their perceptions to accept their situation, and tried to work with what they could, were less likely to be distressed than their colleagues. However, other reports have shown that positive reframing was not associated with improved distress outcomes as COVID-19 continued, possibly due to the ongoing nature of the pandemic (Babore *et al*., 2020). While positive reframing may be beneficial in short-term exposures to stressful stimuli, long-term and repeated exposure to the same stressor may eventually overpower and overwhelm this mechanism. Alternatively, the ability to accept that some psychological distress is unavoidable in the face of adversity has also been suggested as more pragmatic when faced with a pandemic with no resolution in sight (Leszcz *et al*., 2020; Folkman and Greer, 2000; Maunder *et al*., 2008). Emphasis on

finding meaning and value in their work has also been shown to be a crucial protective factor for HCWs in past times of crisis and the current pandemic (Davey *et al*., 2022). Those who were able to shift their focus from ~~problem~~ problem-solving to finding value and meaning in the care they provided ~~was~~ were shown to protect HCWs between waves of COVID-19 (Davy *et al*., 2022). This in turn seems to act as a protective factor for psychological distress and likely increased HCW confidence in their ability to cope with stress and their personal resilience, similar to our findings.

Despite ample evidence that engaging in active, externally-based coping strategies can reduce psychological distress, our findings ~~Active-based coping is normally protective but in the current study it was associated~~found the opposite ~~with higher levels of psychological distress~~. Th~~is~~ese ~~form~~ coping strategies~~of coping normally~~ involve~~involves~~ seeking out information and support, as well as acting and using ~~problem~~ problem-solving to manage distress. ~~However~~This may be~~,~~ due to the unresolvable nature of COVID-19, leaving ~~problem~~ problem-solving behaviours ~~were not as~~less useful ~~as~~ than ~~they had been~~ in past pandemics (Babore *et al*., 2020). Equally likely was that given the mass confusion and unknowable nature of the virus, seeking out information merely exposed individuals to higher levels of distress and seeking support became more difficult when everyone was plunged into the same crisis simultaneously. That is not to say that employing ~~active~~ external~~based~~ coping will continue to expose individuals to stress in a crisis, but those who may have previously relied on these actions when faced with a threat could experience more distress, where formerly these actions had been successful. However, persevering through the pandemic with this coping style has been shown to leave HCWs vulnerable to experiencing burnout and lead to the dissolution ~~with~~ of their work (Davey *et al*., 2022, Petrella *et al*., 2021). This ~~therefore,~~ therefore, warrants ongoing observation and future research.

Self-criticalness emerged as an important factor associated with greater levels of psychological distress. When someone is self-critical, they may turn inwards on themselves during a stressful event and experience feelings of regret, failure, guilt and disgust (Stroebe *et al*., 2014; Maunder *et al*., 2006). As observed during the SARS pandemic, ~~reactions~~ attempting to cope by~~such as~~ self-blam~~ing~~e and avoid~~ing~~ance significantly increased the likelihood ~~for~~ of HCWs ~~to experience~~experiencing psychological distress and contributed to long-term negative effects and lower QoL (Maunder *et al*., 2006). ~~For those working on the frontline, self-criticism had the potential to contribute to distress, blaming themselves for the widespread loss of life which was characteristic of the early stages of the pandemic.~~ Self-criticism has long been identified as an issue for HCWs, where a sense of culpability in the death of a patient can have a serious impact on HCW well-being and lead to burnout when left unmitigated (Spataro *et al*., 2016). With this in mind, the impact on HCWs from the high levels of patient morbidity at the beginning of the pandemic, combined with a ~~tendency~~ risk of~~to~~ internally ~~blame~~ blaming themselves,

is cause for immediate concern. ~~There is preliminary evidence that self-criticism as a form of coping has been widely endorsed by HCWs during the pandemic (Ji *et al.*, 2016).~~ This can further contribute~~d~~ to HCWs lacking confidence in their skills and feeling disconnected from their roles (Davey *et al.*, 2022), as well as a ~~. This may also contribute to the~~ rise in HCWs migrating from their jobs, feeling they are not personally resilient enough to deal with the stressors of their roles.

The identity of HCWs as 'angels' and 'heroes' may have led many to place their own well-being as secondary to the duty of their role, which has long been an observed ~~phenomena~~ phenomenon in the industry (Spataro *et al.*, 2016). This image was further compounded by an intense public focus during the pandemic, which may have left HCWs feeling unable to express their distress ~~in a healthy wa~~healthily. Feeling as though they were failing to cope with the stress inherent to the pandemic as a lack of personal resilience rather than the product of an overwhelming crisis may in turn have led to high levels of self-criticism which directly impacted their psychological distress. Emerging evidence also highlighted that a loss of self-confidence in their skills and an increase in self-criticism contributed highly to HCW well-being during the first year of the pandemic (Davey *et al.*, 2022). HCWs who expressed frustration with their inability to adapt to the changes to their roles and environment placed blame on themselves for not being able to deliver what they felt was optimal patient care, despite the fact much of this stemmed from organisational policies such as redeployment and restrictive PPE procedures (Davey *et al.*, 2022).

This study offers a snapshot of a system in crisis and an example of how HCWs' resilience and coping mechanisms were affected in the early stages of the pandemic. Our sample showed that ~~maladaptive and~~ self-critical~~ness~~ ~~behaviours were~~is associated with ~~likely to lead to~~ higher levels of psychological distress~~,~~ and that externally based, ~~problem~~ problem-solving ~~behaviours~~ strategies equally did not protect wellbeing. Recent reports also suggest that those who attempted to solve an unsolvable problem during the first wave of the COVID-19 pandemic experienced signs of becoming disillusioned with their work, a trait commonly associated with burnout (Byrne, 1991).~~when these coping mechanisms were employed in the first stage of the pandemic they led to further and mor widespread systemic disruption in subsequent waves (Gillen *et al.*, 2022).~~ Without intervention, this is likely to have highly impacted HCW resilience and well-being ~~as the pandemic continued to unfold~~. A profile of those most vulnerable to distress has also emerged in the literature (Petrella *et al.*, 2021). Fortunately, there is some evidence that when resources are available those who were most likely to experience distress were also shown to seek out support (Petrella *et al.*, 2021).

Engaging HCWs in help-seeking initiatives remains a challenge. Seeking help may be internalized as a failure to cope given the current culture of duty.

However, help-seeking behaviours still remains a complication for HCWs. Given the discourse of their identity and duty, many feel as though seeking formal support is emblematic of their lack of resilience. This may lead to a cycle of self-criticism, increasing psychological distress and resulting in a lack of self-confidence which also restricts their ability to seek help due to feeling as though they are failing in their role. In order tTo counter this, work needs to be done to help HCWs reframe their understanding of resilience. Rather than just a focus on personal reserves of strength and perseverance, psychoeducation needs to be provided to help the workforce accept that resilience also requires self-care, help-seeking in times of struggle and self-reflection in order to be sustainable (Henshall et al., 2020). Crucially addressing and diluting the stigma attached aroundwith self-care and help-seeking in HCW culture needs to be prioritised (Petrella et al., 2021). There is a need for structured support to help individuals maintain their resilience and well-being, this is as much an organisational responsibility as it is personal (Riekert et al., 2021). Theoretically, thisthese findings analysis of multi-centre data expands on the applicability of the three circles Gilbert's model of emotional regulation by highlighting the importance of developing our internal soothing system (Gilbert, 2009). When under threat (pandemic) which is outside of our control, focusing on the drive system (activeexternal -based coping) may trigger self-criticism when we are unable to reach a resolutionsolve the problem. Cultivating self-compassion is a viable alternative to self-criticism and a way to cope with acute challenges continuously faced by HCWs. To do this the NHS will need to invest in more in-built psychological support for its staff. Psychosocial support needs to be monitored and promoted alongside practical elements such as defined roles and responsibilities, healthier working patterns and better working conditions for staff. While works needs to be done to encourage and empower staff to utilise supportive services, work also needs to be done with managers and organisational leads to provide protected time for their staff to use these services.

*Limitations*

Limitations to this work pertain to the unique context of COVID-19 and should be considered when interpreting findings. First, the sample was self-selecting which may limit generalisability. Second, the survey was developed with the requirement that it be brief (approximately 10- minutes to complete), thus, it was not feasible to include the full validated measure for coping. There may be additional coping strategies associated with psychological distress that were therefore missed. Lastly, the cross-sectional design, does not allow for inference of temporality or causality as the COVID-19 pandemic progressed. Despite these limitations, the current study included a large number of participants working across [location after review] working clinically as well as at home, which reflects the occupational situation at the time, which continued throughout the pandemic.

*Contribution to Theory and Practice*

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This multi-centre evaluation provides a unique snapshot of the level of psychological distress among HCWs during the onset of a pandemic, as well as insight into types of coping strategies to support/caution. These novel findings have directly informed in-built psychological support for staff among participating hospitals, particularly around the potential negative impact of engaging with external based coping under these circumstances. As well as assessing levels of self-criticism and supporting the shift to self-compassion, an example of an internal based coping strategy. Future research can build on our findings to develop and evaluate theory-based supportive programming grounded in models such as Gilbert's three circles of emotional regulation. However, individual support efforts alone will not suffice. The rhetoric around HCW resilience and coping needs to be adapted to include the responsibility of the organisation as a whole if we are to support HCWs to navigate a system in peril.

## Conclusion

What is most critical now is understanding how we can actively support HCWs. We know that while some profiles may be more at risk, the toxicity of self-criticism is an issue which may be prevalent amongst HCWs. Regardless of whether HCWs were on the frontline or were non-clinical, the overwhelming sense of personal burden at the beginning of the pandemic has no doubt taken its toll on many individuals. Shifting from a culture of personal resilience towards a culture of professional reliance will be essential for wellbeing. Validating and praising HCWs for the work they do, rather than focusing on what they fail to do, will be important. It can no longer be the job of the individual to build and maintain their own well of resilience in the face of ongoing threats and adversity, nor will it be helpful for HCWs to feel personally responsible for situations which are completely uncontrollable. Shifting from internal cognitive forms of coping towards external forms of support and communication buoyed by an engaged organisation will be necessary. Integrating personal and professional resilience within one system allows for the facilitation of recovery responses for which the NHS is greatly in need of. This includes self-care, for frontline staff and leaders alike, targeted education on coping and resilience, providing reflective spaces, visible leadership and adapting supportive services to suit staff needs (Connelly *et al.*, 2022). If these issues are not addressed with alacrity, it is likely to lead to widespread psychosocial distress and burnout in the workforce, which could have significant long-term impacts on the healthcare sector in an age where their stability is needed most.

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**Data availability**: Data that support the findings of this study are available from the corresponding author upon reasonable request.

**Contributors**: AP: study design, questionnaire construction, recruitment, data collection, data interpretation, data analysis, literature search, and writing. LH: study design, questionnaire construction, data collection, data curation, data interpretation, literature search, and writing. LF: study design, questionnaire construction, data interpretation, writing, editing LM: study design, recruitment, writing, and editing BH: study design, recruitment, editing AM: study design, recruitment, editing RT: study design, questionnaire construction, recruitment, data interpretation writing, and editing

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## References

Ahmed F, Zhao F, Faraz NA. (2020). How and when does inclusive leadership curb psychological distress during a crisis? Evidence from the COVID-19 outbreak. Front Psychol; 11:1898. doi: 10.3389/fpsyg.2020.01898

Alan H, Eskin Bacaksiz F, Tiryaki Sen H, Taskiran Eskici G, Gumus E, Harmanci Seren AK. (2021). "I'm a hero, but…": An evaluation of depression, anxiety, and stress levels of frontline healthcare professionals during COVID-19 pandemic in Turkey. Perspectives in Psychiatric Care;57:1126–1136. https://doi.org/10.1111/ppc.12666

Anderson JC, Gerbing DW. (1988). Structural equation modeling in practice: A review and recommended two-step approach. Psychological bulletin;103:411.

Arafa A, Mohammed Z, Mahmoud O, Elshazley M, Ewis A. (2021). Depressed, anxious, and stressed: what have healthcare workers on the frontlines in Egypt and Saudi

18

Arabia experienced during the COVID-19 pandemic? J Affect Disord; 278:365–71. doi: 10.1016/j.jad.2020.09.080

Babore A, Lombardi L, Viceconti ML, Pignataro S, Marino V, Crudele M, et al. (2020). Psychological effects of the COVID-2019 pandemic: perceived stress and coping strategies among healthcare professionals. Psychiatry Res; 293:113366. doi: 10.1016/j.psychres.2020.113366

Barello S, Palamenghi L, Graffigna G. (2020). Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic. Psychiatry Research;290:113-129. https://doi.org/10.1016/j.psychres.2020.113129

Black N. (2013). Can England's NHS Survive? N. Engl. J. Med;369:1–3. doi: 10.1056/NEJMp1305771.

Blekas A, Voitsidis P, Athanasiadou M et al. (2020). COVID-19: PTSD symptoms in Greek health care professionals. Psychol Trauma; 12:812–9. doi: 10.1037/tra0000914

British Psychological Society. (2020). Covid19 Staff Wellbeing Group The psychological needs of healthcare staff as a result of the Coronavirus pandemic; Available from https://www.bps.org.uk/sites/www.bps.org.uk/files/News/News%20-%20Files/Psychological%20needs%20of%20healthcare%20staff.pdf [retrieved on 24/09/2021].

Brooks SK, Dunn R, Amlot R, Rubin GJ, Greenberg N. (2018). A systematic, thematic review of social and occupational factors associated with psychological outcomes in healthcare employees during an infectious disease outbreak. Journal of Occupational and Environmental Medicine;60: 248-257.

Byrne, B. M. (1991). Burnout: Investigating the impact of background variables for elementary, intermediate, secondary, and university educators. Teaching and Teacher Education, 7(2), 197–209. https://doi.org/10.1016/0742-051x(91)90027-m

Carver CS. (1997). You want to measure coping but your protocol's too long: Consider the brief cope. International Journal of Behavioral Medicine;4: 92-100.

Chaplin TM, Hong K, Bergquist K. Sinha R. (2008)/ Gender Differences in Response to Emotional Stress: An Assessment Across Subjective, Behavioral, and Physiological Domains and Relations to Alcohol Craving. Alcoholism: Clinical and Experimental Research;32: 1242-1250. https://doi.org/10.1111/j.1530-0277.2008.00679.x

Cohen J. (1988). The effect size. Statistical power analysis for the behavioral sciences;77-83.

Connelly, D. M., Garnett, A., Snobelen, N., Guitar, N., Flores-Sandoval, C., Sinha, S., Calver, J., Pearson, D., & Smith-Carrier, T. (2022). Resilience amongst Ontario registered practical nurses in long-term care homes during COVID-19: A grounded theory study. Journal of Advanced Nursing, 78, 4221– 4235. https://doi.org/10.1111/jan.15453

Couarraze S., Delamarre L., Marhar F., Quach B., Jiao J., Avilés Dorlhiac R., Saadaoui F., Liu A.S., Dubuis B., Antunes S., et al. (2021). The major worldwide stress of healthcare professionals during the first wave of the COVID-19 pandemic—The international COVISTRESS survey. PLoS ONE;16:e0257840. doi: 10.1371/journal.pone.0257840

Davey, Z., Srikesavan, C., Cipriani, A., & Henshall, C. (2022). It's What We Do: Experiences of UK Nurses Working during the COVID-19 Pandemic: Impact on Practice, Identity and Resilience. Healthcare (Basel, Switzerland), 10(9), 1674. https://doi.org/10.3390/healthcare10091674

Folkman S, Greer S. (2000). Promoting psychological well-being in the face of serious illness: When theory, research and practice inform each other. Psycho-Oncology;9:11−19.

García F, Barraza-Peña C, Wlodarczyk A, Alvear-Carrasco M, Reyes-Reyes A. (2018). Psychometric properties of the Brief-COPE for the evaluation of coping strategies in the Chilean population. Psicologia: Reflexão E Crítica;31: doi: 10.1186/s41155-018-0102-3

Gilber, P. (2009). The Compassionate Mind: A New Approach to Life's Challenges. London: Contable and Robinson.

Gillen, P. et al. (2022) "Wellbeing and coping of UK nurses, midwives and allied health professionals during COVID-19-A cross-sectional study," PLOS ONE, 17(9). Available at: https://doi.org/10.1371/journal.pone.0274036.

Han L, Wong FKY, She DLM, et al. (2020). Anxiety and depression of nurses in a North West province in China during the period of novel coronavirus pneumonia outbreak. J Nurs Scholarship; 52:564–73. doi: 10.1111/jnu.12590

Health Research Authority. (2021). Is my study research? Available from: http://www.hra-decisiontools.org.uk/research/ [accessed on 29th November 2021]

Henshall C., Davey Z., Jackson D (2020). The implementation and evaluation of a resilience enhancement programme for nurses working in the forensic setting. Int. J. Ment. Health Nurs;29:508–520. doi: 10.1111/inm.12689

Holton S, Wynter K, Trueman M. et al.(2021). Psychological well-being of Australian hospital clinical staff during the COVID-19 pandemic. Australian health review: a publication of the Australian Hospital Association;45: 297–305. https://doi.org/10.1071/AH20203

Hong S, Ai M, Xu X, Wang W, et al. (2020). Immediate psychological impact on nurses working at 42 government-designated hospitals during COVID-19 outbreak in China: a cross-sectional study. Nurs Outlook. doi: 10.1016/j.outlook.2020.07.007

Horwitz AV. (2007). Distinguishing distress from disorder as psychological outcomes of stressful social arrangements. Health; 11:273–89. doi: 10.1177/1363459307077541https://doi.org/10.1097/JOM.0000000000001235

Ji Z, Han W, Deng Z, Lu K. (2021). Distress, Appraisal, and Coping Among the Frontline Healthcare Provider Redeployed to the Epicenter in China During COVID-19 Pandemic. Frontiers in psychology;12: 678369. https://doi.org/10.3389/fpsyg.2021.678369

Kessler RC, Barker PR, Colpe LJ et al. (2003). Screening for serious mental illness in the general population. Archives of General Psychiatry;60:184–189. https://doi.org/10.1001/archpsyc.60.2.184

Lazarus R S, Folkman S. (1984). Stress, appraisal, and coping. New York: Springer.

Leszcz M, Maunder R, Hunter J. (2020). Psychological support for health care workers during the COVID-19 pandemic. Canadian Medical Association;192 : E660. https://doi.org/10.1503/cmaj.75864

Marchand A, Demers A, Durand P. (2005). Does work really cause distress? The contribution of occupational structure and work organization to the experience of psychological distress. Social science & Medicine; 61:1–14. https://doi.org/10.1016/j.socscimed.2004.11.037

Marsh HW, Hau KT, Wen Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cut-off values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. Structural equation Modeling, 2004;11: 320-341. https://doi.org/10.1207/s15328007sem1103_2

Maunder RG, Lancee WJ, Balderson KE et al. (2006). Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. Emerg Infect Dis;12:1924–1932.

Maunder, Robert G et al. (2008). "Applying the lessons of SARS to pandemic influenza: an evidence-based approach to mitigating the stress experienced by healthcare workers." Canadian journal of public health = Revue canadienne de sante publique vol. 99,6, 486-8. doi:10.1007/BF03403782

McAlonan GM, Lee AM, Cheung V, et al. (2007). Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. Can J Psychiatry; 52:241-247. doi:10.1177/070674370705200406

Morgantini L.A., Naha U., Wang H., Francavilla S., Acar Ö., Flores J.M., Crivellaro S., Moreira D., Abern M., Eklund M., et al. (2020). Factors contributing to healthcare professional burnout during the COVID-19 pandemic: A rapid turnaround global survey. *PLoS ONE*;15:e0238217. doi: 10.1371/journal.pone.0238217.

Peisah C, Latif E, Wilhelm K, et al. (2009). Secrets to psychological success: why older doctors might have lower psychological distress and burnout than younger doctors. Aging Ment Health;13:300–7.

Rieckert A., Schuit E., Bleijenberg N., Ten Cate D., de Lange W., de Man-van Ginkel J.M., Mathijssen E., Smit L.C., Stalpers D., Schoonhoven L., et al. (2021). How can we build and maintain the resilience of our health care professionals during COVID-19? Recommendations based on a scoping review. BMJ Open;11:e043718. doi: 10.1136/bmjopen-2020-043718.

Sirois, F and Owens J. (2021). Factors Associated With Psychological Distress in Health-Care Workers During an Infectious Disease Outbreak: A Rapid Systematic Review of the Evidence. Frontiers In Psychiatry;11. doi: 10.3389/fpsyt.2020.589545

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Spataro B, Tilstra S, Rubio D, McNeil M. (2016). The Toxicity of Self-Blame: Sex
        Differences in Burnout and Coping in Internal Medicine Trainees. Journal Of
        Women's Health;25:1147-1152. doi: 10.1089/jwh.2015.5604

Staiger T, Stiawa M, Mueller-Stierlin A et al. (2020). Masculinity and Help-Seeking
        Among Men With Depression: A Qualitative Study. Frontiers In Psychiatry;11. doi:
        10.3389/fpsyt.2020.599039

Stokes-Parish J., Elliott R., Rolls K., Massey D. (2020). Angels and Heroes: The
        Unintended Consequence of the Hero Narrative. *J. Nurs. Scholarsh*;52:462–466.
        doi: 10.1111/jnu.12591.

Tabachnick BG, Fidell LS, Ullman JB. (2007). Using multivariate statistics. Boston, MA:
        Pearson;5:481-498.

Taylor C, Graham J, Potts H, Candy J, Richards M, Ramirez A. (2007). Impact of
        hospital consultants' poor mental health on patient care. Br J Psychiatry;
        190:268–9. doi: 10.1192/bjp.bp.106.023234

Thompson RJ, Mata J, Jaeggi SM. Et al. (2010). Maladaptive coping, adaptive coping,
        and depressive symptoms: Variations across age and depressive state. Behavior
        Research and Therapy;4:459-466. doi: 10.1016/j.brat.2010.01.007

Ungar, M. (2018). Systemic resilience. Ecology and Society, 23(4), 34– 52.

Table 1: Respondents personal and professional characteristics at time one

| Variable | | n (%) |
|---|---|---|
| Age (*N* = 2117) | 16-26 | 182 (8.6%) |
| | 27-37 | 667 (31.5%) |
| | 38-48 | 544 (25.7%) |
| | 49-59 | 577 (27.3%) |
| | 60-70 | 141 (6.7%) |
| | >70 | 6 (0.2%) |
| Gender (*N* = 2117) | Female | 1619 (76.5%) |
| | Male | 483 (22.8%) |
| Ethnicity (*N* = 981) | White | 658 (67%) |
| | Other | 323 (33%) |
| Years worked at the hospital (*N* = 1793) | < 1 year | 163 (9.1%) |
| | 1 - 6 | 880 (49.1%) |
| | 7 - 10 | 237 (13.2%) |
| | 11 - 20 years | 358 (20%) |
| | > 20 years | 155 (8.6%) |
| Working clinically (*N* =1863) | Yes | 1222 (65.6%) |
| | No | 641 (34.4%) |

*Note:* SD = standard deviation. *N* = total number of respondents for each item. *n* = number of respondents associated with each answer. * = multiple responses given on this question.
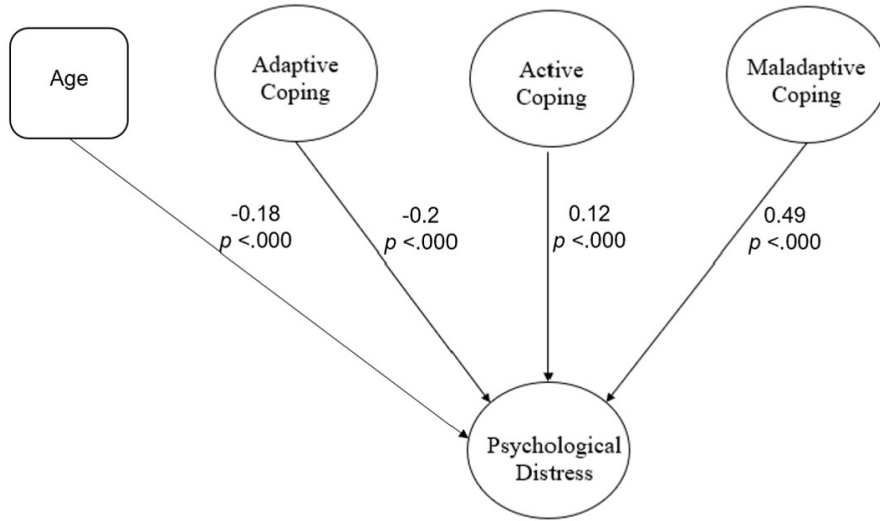
Table 2: Error-free correlations for observed and latent variables

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Age | -- | | | | | | |
| 2. Gender (0=male; 1=female) | -0.07** | -- | | | | | |
| 3. Years worked at hospital | 0.5** | 0.01 | -- | | | | |
| 4. Active coping | -0.16** | 0.13** | -0.17** | -- | | | |
| 5. Adaptive coping | -0.06* | 0.09** | -0.05 | 0.36** | -- | | |
| 6. Maladaptive coping | -0.13** | 0.12** | -0.07** | 0.18** | -0.01 | -- | |
| 7. Psychological distress | -0.25** | 0.09** | -0.15** | -0.15** | -0.15** | -0.13** | -- |

*Note:* * indicates p < 0.05. ** indicates p < 0.01

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