Evaluation of the impact of redeployment during the COVID-19 pandemic: results from a multi-centre survey

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Abstract:	Background: The COVID-19 pandemic brought unprecedented upheaval for healthcare systems globally. Rapid changes in the way nurses were asked to work brought about many challenges, especially with the requirement for nurses to move into intensive care and high dependency areas to deliver care for the increasing number of critically ill patients. Aim: The purpose of this evaluation was to assess the impact of these changes on nurses who were redeployed during the first acute phase of the pandemic and explore factors associated with burnout. Methods: A redeployment survey, containing 42 items in four domains (preparation for redeployment, safety and support, perceived competence, reflections and emotional impact) was administered online to nurses who had been redeployed in two hospitals in England, one urban and one rural. Bivariate correlations and a multiple linear regression model were conducted to explore associations between perceptions of leadership, training, communication, and feeling valued with levels of emotional exhaustion. Results: Valid responses were received from 240/618 (39%) nurses. The majority of respondents felt it was their duty to work where they were asked (79%), were prepared to work where needed (72%) and were consulted on changes to their working hours (55%). However, nurses were nervous about the new role (75%) and felt they had a lack of choice regarding redeployment (66%) and the way it was implemented (50%). Multiple regression analysis showed that lack of training (β=0.18) and feeling undervalued (β=0.48) was positively associated with emotional exhaustion, which accounted for 37% of the variance among redeployed nurses.

	Conclusions: To mitigate the risk of nurses developing burnout as a result of redeployment, there is a need for training to upskill them so they feel competent in doing the changed role. Additionally, nursing leadership needs to support nurses feeling valued as individuals in their role.

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Keywords: COVID-19, redeployment, burnout, nurse education, valued

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Introduction

In early 2020, healthcare systems across the globe implemented rapid changes in response to the COVID-19 pandemic. As the situation unfolded, healthcare workers were rapidly redeployed across the National Health Service in the United Kingdom ~~in order~~ to manage the influx of patients being admitted with COVID-19 (Maben and Bridges, 2020; Menzies et al, 2020). This response, although necessary, involved the upheaval of individual healthcare workers, predominantly nurses, into situations associated with high occupational health risk~~s~~.

Redeployment, an essential response in emergency situations, involves direct changes to how and where individuals carry out their role (Brooks et al, 2018; Vera San Juan et al, 2022). The impact of redeployment range~~s~~ considerably and varies by institution based on geographical location (urban vs rural hospital), population, context and stage of the pandemic at which it is operating (Vera San Juan et al., 2022). However, regardless of the amount of change experienced, poorly managed redeployment has been associated with adverse outcomes (Maunder et al, 2006, Nickell et al, 2004). Nurses may be required to work in new environments outside of their scope of practice (Kim, 2018), are exposed to a larger proportion of critically unwell and infectious patients and may be faced with ethically challenging complex decision-making (Maunder et al, 2006, Nickell et al, 2004). Negative long-term impacts of redeployment observed following the SARS pandemic included burnout, depressive and anxious symptoms, poor health behaviours (e.g., increased alcohol consumption), increased sick leave, decreased working hours and disengagement with patient facing work (Maunder et al, 2008, Maunder, 2009).

The British Psychological Society released a guide for managing the wellbeing of healthcare workers during the pandemic (British Psychological Society, 2020), which emphasised the necessity for visible leadership and clear communication to support staff. Distress and moral injury were expected to impact healthcare workers during this period, and without proper intervention, the guide warned of potential disillusionment and burnout among staff. To counteract this, a recovery model was suggested which promoted actively learning from these experiences to help staff become better trained and educated on how to handle similar situations in the future (British Psychological Society, 2020). This was likewise supported by the redeployment guidance produced by the English Government (National Health Service England 2020). The British Psychological Society recovery model further highlighted the importance of making staff feel valued for their work and contributions during this time. Feeling valued has previously been identified as a particularly important component ~~for~~ of a healthy work environment (Flett and Heisel, 2020; Rook et al, 2020). Feeling valued improves performance, helps to protect~~s~~ from symptoms of burnout and disillusionment, and bolsters feelings of being recognised and appreciated on an individual basis, which was suggested as important for supporting staff as the pandemic unfolded (British Psychological Society, 2020, Laskowski-Jones, 2019; Paton and Cur, 2019).

Given the enduring landscape of COVID-19 compared to past pandemics, the experience of redeployment needed to be ~~it was important that the experience of redeployment was~~ monitored to ensure nurses wellbeing was appropriately supported. The purpose of this study was to evaluate the impact of redeployment on nurses following the first wave of the

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pandemic and describe factors associated with burnout ~~in order~~ to understand how best to protect nurses in the future. This was done in a multi-phased approach: develop a questionnaire to specifically measure the experience of redeployment; evaluate the experience and impact of redeployment on nurses in an urban and rural setting; and explore factors associated with nurses' wellbeing ~~in order~~ to support best practice moving forward.

Methods

Study design

This was an evaluation using a cross-sectional online survey administered to nurses[1] redeployed at two hospitals in the United Kingdom following the first wave of the COVID-19 pandemic.

Participants

The study was based in one urban teaching hospital (H1) and one rural district general hospital (H2) in England. The respective baseline critical care capacity for H1 was 35 and this surged by 240%. For H2 the baseline was 9 beds and this surged by 300% and was the most surged hospital in the [location inserted after review]. In May 2020, following the first peak of the first wave of the pandemic, redeployed nurses were invited via email to participate in an online survey. The invite was sent by a person in the hospital who had not been involved in their redeployment.

Data collection

Redeployment questionnaire

A review of the literature did not identify a questionnaire that specifically measured the impact of redeployment. The free text comments from an open-ended question in the Royal College of Nursing Research Society-led ICON (Impact of Covid On Nurses) study asking about satisfaction with redeployment (Couper et al., 2021) was used to inform questionnaire content. The survey was developed based on the guidance of de Leeuw et al. (2008). A total of 697 comments were assigned themes and subthemes by four researchers. Comments representing the concepts in each theme were identified and the wording amended to be a clear statement that would fit the response scale. Of the 86 questions developed, 43 were selected through expert consensus to represent the themes of preparation for redeployment (n=12), emotional impact (n=14), safety and support (n=6), perceived competence (n=5) and reflections (n=6). All responses were on a five-point Likert scale (1=totally disagree to 5=totally agree) and included 19 positively framed items (e.g., I am confident in the role I have been reassigned to) and 24 negatively framed items (e.g., I feel undervalued). The content of the questionnaire was independently reviewed by a researcher with expertise in survey design and the nursing and midwifery leadership team in one hospital. A copy of the questionnaire is available in the supplemental file.

Validated Measures

[1] The main focus of this evaluation was on nurses but both hospitals redeployed other professionally trained staff alongside nurses so their data were included in the analysis. The term 'nurse' is being used to reflect this being the predominant profession.

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In addition to the investigator designed questionnaire, 14 items adapted from validated measures were included which measured aspects of burnout, self-rated health and moral distress. To ensure the questionnaire remained brief, items were chosen based on appropriateness to the current situation.

Moral distress Seven items were adapted from the Moral Distress Scale (Corley et al., 2001) and explored exposure to morally distressing situations specific to team communication, self-efficacy, patient workload, goals of care, team competency, administrative support, resources, and personal and protective equipment. Items (e.g., I was required to care for more patients than I could safely care for') were scored on a five-point Likert scale (1=totally disagree, 5=totally agree) and were designed to stand alone and have been shown to be reliable and valid for use among health care professionals.

Self-rated health Two items were used to assess perceptions of physical health and mental health, which were adapted from validated self-rated health single questions shown to be a reliable and valid global assessment of health and wellbeing (Krause and Jay, 1994; Picard et al., 2013). Each item ('I am in poor physical/mental health') was scored on a five-point Likert scale (1=totally disagree, 5=totally agree); a lower score reflected better perceived health and higher scores endorsed poor health.

Burnout Five items were adapted from the Maslach Burnout Inventory (Bryne, 1991) based on appropriateness and the strength of the original factor loading scores. Two items ~~representing~~ measured emotional exhaustion, two measured representing depersonalisation, and one item measured ~~thering~~ ability to deal with problems effectively. Items (e.g., I feel emotionally drained from my work) were rated on a five-point Likert scale (1=totally disagree, 5=totally agree). The items adapted for this evaluation have been validated among healthcare professionals (Peisah et al., 2009).

Personal and professional characteristics

Finally, questions were included to capture participants' personal (age, gender, ethnicity) and relevant professional characteristics (job title, department, years worked in the hospital, redeployment status and location).

Procedure

The Redeployment Questionnaire was administered through an online survey from 20/05/20 to 20/06/20. Two reminder emails were sent to those who did not respond. Nurses were eligible to participate if they were identified as being eligible for redeployment and had access to the internet to complete the survey (mobile or desktop). Completion of the survey was taken as implicit ~~of~~ consent and there were no questions requesting details that could identify respondents.

Analysis

Questionnaire data were analysed in R (version 3.5.3; R Core Team, 2013). All positively framed items from the investigator-led questions were reverse coded. A Chi-Square test was used to detect difference between hospitals on the investigator-led questions and a T-test for the validated measures (i.e., burnout). To reduce the risk of observing at least one statistically significant result by chance (type 1 error), a Bonferroni correction was made to

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set the significance cut-off specifically for the number of simultaneous tests that were undertaken. Significance was therefore set as p<0.001.

Bivariate correlations and a multiple linear regression model were conducted to explore associations between perceptions of leadership, training, communication, and feeling valued with levels of emotional exhaustion, while controlling for the location of redeployment (hospital).

Ethics approval

In line with guidance from the Health Research Authority (HRA) in England, this project was defined as service evaluation and not research (http://www.hra-decisiontools.org.uk/research/), and therefore HRA approval was not required. However, to safeguard staff who participated in the evaluation it was conducted according to the United Kingdom Policy Framework for Health and Social Care Research (HRA, 2017), and approval to conduct the evaluation was given by senior nursing leadership teams in both organisations. Information about the purpose of the survey was provided at the beginning of the survey and submission of a response was taken as implicit ~~of~~ consent

Results

A total of 618 nurses were invited to participate; 458 nurses were identified at H1 and 160 at H2. From H1 there were 198 (43%) responses: 156 (79%) had been redeployed and therefore eligible for inclusion in the analysis, and valid responses were available for 143 (72%). From H2, 160 (100%) had been redeployed and valid responses were available for 96 (60%). The final sample included 240 nurses who had been redeployed during the acute phase of the COVID-19 pandemic.

Participant characteristics are shown in Table 1. The majority of respondents were nurses (n=175; 81%), Caucasian (n=178; 75%), and female (n=199; 87%). While there was no difference in gender between the two hospitals, those in H2 were statistically significantly older (χ^2[*df*=5]=23.99, *p*<.001), had a higher proportion of respondents who were Caucasian (χ^2[*df*=1]=35.49, *p*<.001), and respondents had been employed longer in the hospital (χ^2[*df*=6]=12.67, *p*=.049). No research nurses responded from H2 but a greater number of professionals other than nurses responded (χ^2[*df*=6]=48.35, *p*<.001). Nurses were asked whether or not they knew they were going to be redeployed: more respondents in H1 were aware they were on a list to be redeployed in comparison to H2 (129 (90%) vs. 67 (70%) respectively, χ^2[*df*=1]=16.23, *p*<.001).

Preparation for redeployment

Respondents felt it was their duty to work where they were asked (n=187; 79%), were prepared to work where they were needed (n=169; 72%) and were consulted in the changes to their working hours (n=127; 55%). However, the majority were nervous about the new role (n=175; 75%)~~,~~ and felt they had a lack of choice regarding the details of redeployment (n=151; 66%) and the processes in the way it was implemented (n=116; 50%; supplemental file: Table S1). Differences were observed between the 2 hospitals. More respondents in H2 did not volunteer to be redeployed (χ^2[*df*=2]=22.73, *p*<.001) and were not given enough notice (χ^2[*df*=2]=17.04, *p*<.001).

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Safety and support

The responses for safety and support are shown in Table S2 (supplemental file). Respondents reported experiencing a supportive environment (n=157; 69%), did not find their colleagues rude and unhelpful (n=154; 68%), worked with colleagues that understood what they were going through (n=151; 66%), had developed a bond with the team (n=151; 65%). However, less than half felt self-care was prioritised (n=99; 44%) and just over half felt communication was unclear (n=126; 55%). More respondents in H2 found the atmosphere unsupportive (χ^2[*df*=2]=22.71, *p*<.001), viewed colleagues as rude and unhelpful (χ^2[*df*=2]=26.13, *p*<.001), thought others did not understand their experience (χ^2[*df*=2]=15.72, *p*<.001), did not bond with their new team (χ^2[*df*=2]=28.78, *p*<.001) and did not prioritise self-care (χ^2[*df*=2]=26.87, *p*<.001).

Perceived competence

Table S3 (supplemental file) summarises the results for perceived competence. Fifty-nine percent (n=137) of respondents disagreed that they lacked confidence in their new role, and 55% (n=127) felt their skills were not considered in their new role. ~~There were s~~Similar numbers agree~~d~~ing and disagree~~d~~ing on the perception of having to work outside their scope of practice, lacking acute clinical care experience and being emotionally prepared to work in intensive care or the redeployed area. Nurses in H2 responded that they had less confidence in their new role (χ^2[*df*=2]=27.07, *p*<.001).

Reflections

The majority of respondents had changed their life priorities (n=159; 69%) and felt they had done as much as they could to help (n=150; 66%). Most did not want to leave their profession (n=126; 55%) and had confidence in their hospital (n=126; 55%). However, the majority (n=163; 71%) wanted to return to their pre-redeployed role (supplemental file Table S4). More respondents in H2 felt they had done as much as they could do to help (χ^2[*df*=2]=18.68, *p*<.001) but lacked confidence in the organisation (χ^2[*df*=2]=19.56, *p*<.001).

Emotional impact

The items focusing on the emotional impact are shown in the supplemental file Table S5. The majority of participants could cope emotionally with patients who were dying (n=164; 71%), felt there were people to turn to for advice (n=157; 68%), were not compromised by the lack of personal protective equipment (n=161; 68%), were able to ask for help (n=150; 64%), engaged in self-care (n=132; 58%) and had adequate supervision (n=119; 52%). More respondents in H2 did not have someone to turn to for advice (χ^2[*df*=2]=16.37, *p*<.001), were unable to ask for help (χ^2[*df*=2]=15.75, *p*<.001), did not have the supervision they required (χ^2[*df*=2]=17.92, *p*<.001), felt isolated and underprepared (χ^2[*df*=2]=36.81, *p*<.001), feared criticism if they spoke out about concerns (χ^2[*df*=2]=15.35, *p*<.001), felt undervalued (χ^2[*df*=2]=24.87, *p*<.001) and felt overwhelmed by the redeployed role (χ^2[*df*=2]=18.24, *p*<.001).

Moral distress

Overall, the majority of respondents did not agree they had experienced morally distressing situations. The three situations experienced most were having to work with other healthcare team members who were not as competent as patient care required (n=72; 32%), being

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required to care for patients who they did not feel qualified to care for (n=63; 28%) and being required to care for patients who had unclear or inconsistent treatment plans (n=47; 21%). Figure 1 displays the number of respondents in each hospital who endorsed experiencing morally distressing situations. More nurses in H2 felt they were required to care for patients they did not feel qualified to care for (χ^2[*df*=2]=19.17, *p*<.001) and experienced compromised patient care due to a lack of resources(χ^2[*df*=2]=16.85, *p*<.001).

Self-rated health

While lower ratings were more prevalent for self-rated mental health (17.2% in H1 vs. 23.96% in H2) than self-rated physical health (9.7% vs. 8.3% respectively) by nurses in both hospitals, the majority of respondents did not experience poor self-rated health. There were no differences between hospitals.

Burnout

Respondents in H1 reported statistically significantly lower emotional exhaustion than those in H2 ($M_{Hospital_1}$=3.07 (*SD*=1.38), $M_{Hospital_2}$=3.25 (*SD*=1.29); t(225)=-2.509, *p*=0.01). Participants in H2 reported greater feeling of depersonalisation but this was not statistically significant ($M_{Hospital_1}$=1.99 *SD*=0.95 vs. $M_{Hospital_2}$=2.25 *SD*=1.12; t(224)=-1.901, *p*=0.06). Healthcare professionals in both hospitals agreed (somewhat/totally) that they could deal with problems effectively (n=93; 71% vs. n=68; 71% respectively, (χ^2[*df*=4]=0.77, *p*=.94).

Associations

Bivariate Spearman's correlations of potential covariates (age, gender, ethnicity, years at the Trust, and hospital), key factors (training, communication, leadership and feeling valued) and emotional exhaustion are displayed in Table 2. The location of redeployment (h~~H~~ospital) was the only covariate associated with key factors (except perceptions of leadership) and emotional exhaustion. The small relationships observed suggest that H2 was associated with an observed increase in reporting a lack of training, poor communication, feeling undervalued and higher levels of emotional exhaustion. Medium to large relationships were observed between key factors. All associations were in the expected direction.

Results from the multiple linear regression analysis are presented in Table 3. Lack of training and feeling undervalued were positively and significantly associated with emotional exhaustion, when controlling for hospital. No association was found between lack of leadership or unclear communication and emotional exhaustion. The model accounted for 38% of the variance in emotional exhaustion among redeployed nurses.

Discussion

The current evaluation indicated that at the onset of the COVID-19 pandemic nurses were willing to be redeployed but were nervous and felt they were not given much choice. Once redeployed, interest to stay in the role they had been redeployed to was low. Poor self-rated mental health was more prevalent than self-rated physical health and burnout in the form of emotional exhaustion was reported in over half of respondents; however, burnout in the form of depersonalisation or lack of personal accomplishment was less prevalent. The rate of moral distress was low but when experienced, it was correlated with emotional exhaustion and poorer self-rated mental and physical health. Differences between both hospitals were

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observed including H2 participants being older, employed for longer in the organisation and reporting less awareness that they may be required to be redeployed. However, after controlling for hospital location, feeling valued and receiving adequate training were identified as significant factors in relation to emotional exhaustion.

The fact training was identified as a significant factor for emotional wellbeing could potentially explain some of the variance seen between the two hospitals. Our study was based in an inner- city university hospital and a district general hospital in a rural location; while both hospitals required a 300% increase in the number of critical care beds, the starting point for this was different. At the onset of the pandemic the university hospital had a large number of critical care beds but it also had many acute ward areas treating patients who could be classed as high dependent. There was therefore a large pool of nurses who may not have had these critical care skills but who also required less training to upskill because their baseline competence was higher. They were also more prepared to mentally manage the levels of acuity of the patients who presented in the first wave. The rural hospital on the other hand started with staffing for nine critical care beds, and had limited high dependent patients in other acute ward areas so while they had an experienced, skilled nursing workforce to deliver standard care, they had a lower level of competence to deliver critical care.

We highlighted the importance of effective training for emotional wellbeing. This requirement was outlined in early redeployment guidance published by the English Government (National Health Service England 2020), which is reflected in the literature in showing the importance of training for delivering care focused on the necessary basics nurses would need to operate on the wards, based on their previous roles and skills (Kuang et al, 2020). This stepped approach would allow all nurses access to training on skills such as recognition of worsening conditions, critical care monitoring, mechanical ventilation, response to acute respiratory distress, positioning and administration of medication, while more specialist staff could provide higher levels of intervention and care (Camilleri et al, 2020, Doussot et al, 2020, Kuang et al, 2020). In recognition of the Government guidance, Health Education England provided extensive online training through their learning portal and to facilitate easy access, they waivered the requirement to register and login. Whether these fulfilled nurses training needs is are unclear, however the content reflects the educational priorities identified in a study undertaken by directors of nursing in Ireland: infection protection control, critical care skills and upskilling acute care nursing (Ryder et al, 2021). This suggests training needs for nurses were a global concern not just for those in the United Kingdom.

The importance of training and the impact of the lack of training has been recognised in other studies, for example, nurses in Canada who felt poorly prepared for working with COVID-19 patients reported more intention to leave the profession (Lavoie-Tremblay et al, 2021), similarly there was an association between education and training, and depression and intention to leave the profession in a study of Taiwanese nurses (Li et al, 2021). The importance of training has emerged as a significant facilitator to of emotional wellbeing across all the health professions, with a lack of training being the main cause of stress in medical staff (Sykes and Pandit, 2020), increased anxiety in ophthalmologists (Lim et al, 2020) and in a multidisciplinary study of redeployed research staff, training and adequate support were was an important facilitators for well-being (Veerapen and McKeown, 2021).

Feeling valued is an important mediator for frontline workers wellbeing during acute periods of stress (Flett and Heisel, 2020, Laskowski-Jones, 2019, Rook et al, 2020). Within healthcare, feeling valued and mattering to others has been linked to increased commitment and dedication to nurses work and can help mitigate the negative impacts of occupational stress (Maben and Bridges, 2020, Raso, 2014). Findings from this study of nurses highlights the importance of feeling valued above any other key component identified. In contrast, a lack of feeing valued, or not mattering and feeling expendable or disposable is linked to loneliness and poor physical health, which can contribute to systemic burnout (Paton and Cur, 2019). Actively giving individual nurses the sense that they are valued and that the organisation cares about their wellbeing is therefore, an essential aspect of fostering wellbeing during all phases of the pandemic.

Our study had a number of limitations that should be considered when interpreting the results. First, the redeployment lists used to circulate the online survey did not include doctors and medical or nursing students, and while our results resonate with those in studies in these populations, it cannot be assumed that feeling valued and training have similar importance. Our direct approach of circulating an online survey through National Health Service email may have restricted participation to those who were accessing their work emails, which may have been limited by front-line staff during the pandemic. Thirdly, there was no validated questionnaire specifically measuring the multifaceted experience of redeployment. While we developed a questionnaire as robustly as ~~was~~ possible in the circumstance and the content subsequently reflects the experiences now reported in the literature, there is value for further testing so the utility of the questionnaire in the future can be established. Despite these limitations, this evaluation reports the experiences ~~for~~ of a large number of nurses shortly after being redeployed and has identified key factors that can be easily implemented to prevent emotional distress in the future. It was also conducted shortly after the first wave of the pandemic when the experiences of redeployment were still fresh in their minds. The results therefore, are a true reflection of nurses experiences.

Conclusion

Overall, it must be acknowledged that redeploying staff during a pandemic is challenging, from the perspectives of the nurses themselves and the leaders who manage them. Encouragingly, we found that nurses were mostly willing to support acute care and work as required during this hectic period, and that they benefitted from visible leadership and clear communication. However, in order to mitigate the risk of emotional distress as a result of redeployment, appropriate training and leadership support ~~is~~ are needed. While we could not have foreseen the pandemic and the training ~~that would be~~ needed to deliver care under these circumstances, our results provide compelling arguments for ensuring nurses have ongoing training to keep them upskilled in aspects of acute care delivery, ~~even if they work in more supportive and long-term~~regardless of their nursinge~~s~~ roles. Nevertheless, there is potentially disconnect between the quantity and quality of training. Clinical Educators provided all the additional training nurses were assessed as requir~~ing~~ed to be able to work in acute and critical care areas but our results suggest that this was not perceived as being appropriate or adequate. Understanding the training needs of nurses to work in these areas is important to identify what else they require to feel competent.

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Recognition and feeling valued has been noted as a key strategy to help retain nurses (Williamson et al., 2022a). The association between feeling undervalued and emotional exhaustion suggests a consequence of this could be nurses leaving an organisation or more worryingly, the profession. The onus is therefore on nurse leaders to implement strategies that will make nurses feel valued. While approaches such as the DAISY awards have shown to have meaningful recognition (Williamson et al., 2022b), embedding a culture for making nurses feel valued is needed.

The need to redeploy nurses on such a scale has never occurred in the United Kingdom, and there is a hope it will never happen again. However, redeployment due to other exceptional circumstances continues, for example, to cover derogated care during industrial action, or areas where there are staff shortages. There is a potential dichotomy of needing to develop an agile nursing workforce ~~who~~ that can accommodate all situations but also having nurses with advanced skills to provide care for increasing numbers of patients with complex care needs. The adoption of recommendations made prior to the pandemic for initiatives such as job planning (National Health Service England/Improvement, 2019) may be a solution for empowering nurses to identify this balance.

Key points

- Training nurses to be able to provide acute and critical care should focus not just on the skills and knowledge to deliver this care but also on the attitudes required as a ~~a~~means of ensuring nurses perceive themselves to be competent.
- Having strategies in place to make staff feel valued ~~are~~ is important for reducing the emotional impact of redeployment should this be required in the future, which has the potential for improving retention in the organisation as well as the profession.
- Prior to redeployment healthcare professionals require adequate communication, preparation and training which should become permanent fixtures of healthcare practice and policy.
- Policy for crisis management needs to include guidance on how~~the way in which~~ healthcare workers should be redeployed to avoid wherever possible nurses being~~not be~~ redeployed ~~on~~ at short notice, against their will or to areas they do not feel confident they have the skillset for.

Ethics approval

In line with United Kingdom regulatory guidance, this project was defined as service evaluation and therefore Health Research Authority approval was not required (HRA, 2021). However, approval from the Nursing and Midwifery Leadership Team was granted, who had oversight of its implementation.

References

Brooks, S. K., Dunn, R., Amlot, R., Rubin, G. J., & 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(3): 248-257.

British Psychological Society Covid19 Staff Wellbeing Group (2020). 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 [Accessed 23/05/22].

Byrne, B. M. (1991). Burnout: Investigating the impact of background variables for elementary, intermediate, secondary, and university educators. *Teaching and Teacher Education, 7*(2), 197–20

Camilleri, M., Zhang, X., Norris, M. et al. (2020). Covid-19 ICU remote-learning course (CIRLC): Rapid ICU remote training for frontline health professionals during the COVID-19 pandemic in the UK. Journal of the Intensive Care Society, https://doi.org/10.1177/1751143720972630

Corley, M.C., Elswick, R.K.., Gorman, M.. and Clor, T.. (2001), Development and evaluation of a moral distress scale. Journal of Advanced Nursing, 33: 250-256.

Couper, K., Murrells, T., Sanders, J. et al. (2021). The impact of COVID-19 on the wellbeing of the UK nursing and midwifery workforce during the first pandemic wave: a longitudinal survey study. International journal of nursing studies, https://doi.org/10.1016/j.ijnurstu.2021.104155

de Leeuw, E.D., Hox, J.J., Dillman, D.A. (2008) *International handbook of survey methodology*. Psychology Press, New York

Doussot, A., Ciceron, F., Cerutti, E. et al. (2020). Prone Positioning for Severe Acute Respiratory Distress Syndrome in COVID-19 Patients by a Dedicated Team: A Safe and Pragmatic Reallocation of Medical and Surgical Work Force in Response to the Outbreak. Annals of surgery, 272(6), e311–e315.

Flett, G. L., & Heisel, M. J. (2021). Aging and Feeling Valued Versus Expendable During the COVID-19 Pandemic and Beyond: a Review and Commentary of Why Mattering Is Fundamental to the Health and Well-Being of Older Adults. International journal of mental health and addiction, 19(6), 2443–2469.

Health Research Authority. (2017). UK policy framework for health and social care research, Available: https://s3.eu-west-2.amazonaws.com/www.hra.nhs.uk/media/documents/Final_Accessibility_uk-policy-framework-health-social-care-research_.pdf [Accessed 23/05/22].

Kim Y. (2018). Nurses' experiences of care for patients with Middle East respiratory syndrome-coronavirus in South Korea. American Journal of Infection Control, 46(7), 781–787.

Krause, N. M., & Jay, G. M. (1994). What do global self-rated health items measure?. *Medical care*, *32*(9), 930–942.

Kuang, J., Ashraf, S., Das, U., & Bicchieri, C. (2020). Awareness, Risk Perception, and Stress during the COVID-19 Pandemic in Communities of Tamil Nadu, India. International Journal of Environmental Research and Public Health, *17*(19), 7177.

Laskowski-Jones L. (2019). On feeling valued in a value-based world, Nursing: 49(9):6

Lavoie-Tremblay M, Gelinas C, Aube T et al. (2021) Influence of careing for COVID-19 patients on nurse's turnover, work satisfaction and quality of care. Journal of Nursing Management. 30:33-43

Li T, Oien L, Kao C, Kudo T, Cheng W (2021) Effects of work conditions and organisational strategies on nurses' mental health during the COVID-19 pandemic. Journal of Nursing Management 30:71-78

Maben J., Bridges J. (2020), Covid-19: Supporting nurses' psychological and mental health. J Clin Nurs, 29: 2742-2750.

Maunder RG, Lancee WJ, Rourke, S., et al. (2004). Factors associated with the psychological impact of severe acute respiratory syndrome on nurses and other hospital workers in Toronto. Psychosom Med. 66:938–942.

Maunder R., Lancee W., Balderson K. et al. (2006). Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. Emerging Infectious Diseases, 12(12), 1924–1932.

Maunder RG., Leszcz M., Savage D. 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 99(6), 486–488.

Maunder R. G. (2009). Was SARS a mental health catastrophe? General hospital psychiatry. 31(4); 316–317.

Menzies J, Owen S, Read N et al. (2020). COVID-19: Challenges and opportunities for research nursing and nursing research on paediatric intensive care. Nurs Crit Care. 25: 321– 323.

Nickell LA, Crighton EJ, Tracy CS et al. (2004). Psychosocial effects of SARS on hospital staff: Survey of a large tertiary care institution. CMAJ, 170(5), 793–798.

NHS England (2020) COVID-19: Deploying our people safely. NHS England and NHS Improvement. Publication approval reference 001559: https://www.england.nhs.uk/coronavirus/documents/covid-19-deploying-our-people-safely/ [Accessed 23/05/22]

Paton F., Cur M. (2019). Nurse Burnout: Are you at risk? Nursing News. Retrieved from https://nurseslabs.com/nurse-burnout-are-you-at-risk/ on 07/10/2020

Peisah, C., Latif, E., Wilhelm, K. & Williams, B. (2009) Secrets to psychological success: Why older doctors might have lower psychological distress and burnout than younger doctors, Aging & Mental Health, 13:2, 300-307, DOI: 10.1080/13607860802459831

Raso R. (2014). The importance of being appreciated. Nurs Manage. 45(5):6.

Rook C., O'Brien A., Adarves-Yorno I. (2020) What Are the Key Components of Workplace Well-Being?: Examining Real-Life Experiences in Different Work Contexts. In: Dhiman S. (eds) The Palgrave Handbook of Workplace Well-Being. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-02470-3_68-1

Ryder M, Gallagher P, Coughlan B et al. (2021) Nursing and midwifery workforce readiness during a global pandemic: a survey of the experience of one hospital group in the Republic of Ireland. Journal of Nursing Management. 30:25-32

Sykes A, Pandit M (2021) Experiences, challenges and lessons learnt in medical staff redeployed during responses to COVID-19. BMJ Leader doi:10.1136/leader-2020-000313

Veerapen JD, McKeown E. (2021) Exploration of the views and experiences of research healthcare professionals during their redeployment to clinical roles during the COVID-19 pandemic. Journal of advanced nursing. 77 :4862-4875

Vera San Juan, N., Clark, S. E., Camilleri, M., Jeans, J. P., Monkhouse, A., Chisnall, G., & Vindrola-Padros, C. (2022). Training and redeployment of healthcare workers to

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intensive care units (ICUs) during the COVID-19 pandemic: a systematic review. BMJ open, 12(1), e050038. https://doi.org/10.1136/bmjopen-2021-050038

Williamson L, Burog W, Taylor RM. (2022a) Evaluation of the DAISY (Diseases Attacking the Immune SYstem) award recognising excellence in nursing. British Journal of Nursing 31(19): 976-982

Williamson L, Burog W, Taylor RM. (2022b) A rapid review of strategies used to recruit and retain nurses in the healthcare workforce. Journal of Nursing Management. doi: 10.1111/jonm.13786

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Table 1: Characteristics of healthcare workers who completed the Redeployment Questionnaire following the first wave of the pandemic

Characteristic		All Participants N=240 n (%)	Hospital 1 N=143 n (%)	Hospital 2 N=97 n (%)
Age	16-26 years	14 (6)	8 (6)	6 (6)
	17-37 years	67 (28)	45 (32)	22 (23)
	38-48 years	65 (27)	50 (35)	15 (16)
	49-59 years	78 (33)	33 (23)	45 (47)
	60-70 years	11 (5)	4 (3)	7 (7)
	Prefer not to say	3 (1)	3 (2)	-
	Total	n=238	n=143	n=95
Gender	Male	30 (13)	19 (14)	11 (12)
	Female	199 (87)	115 (86)	84 (88)
	Total	n=229	n=134	n=95
Ethnicity	Caucasian	178 (75)	88 (62)	90 (96)
	Other ethnic group	59 (25)	55 (39)	4 (4)
	Total	n=237	n=143	n=94
Professional role	Allied health professional	19 (~~9~~8)	3 (2)	16 (~~20~~17)
	Research Nurse	29 (~~13~~12)	29 (~~22~~20)	-
	Senior Nurse	17 (~~8~~7)	9 (~~7~~6)	~~15~~ 8 (~~1~~9~~8~~)
	Specialist nurse	92 (~~43~~38)	65 (~~49~~46)	27 (~~34~~29)
	Staff nurse	37 (~~17~~15)	17 (~~13~~12)	20 (~~25~~21)
	Other	22 (~~10~~9)	11 (8)	11 (~~14~~11)
	Total	n=216	n=134	n=~~80~~82
Time employed in the hospital	<1 year	24 (10	16 (11)	8 (9)
	1-2 years	25 (11)	18 (13)	7 (7)
	3-5 years	59 (25)	41 (29)	18 (19)
	6-10 years	29 (12)	11 (8)	18 (19)
	11-15 years	35 (15)	23 (16)	12 (13)
	16-20 years	26 (11)	15 (11)	11 (12)
	>20 years	39 (17)	19 (13)	20 (21)
	Total	n=237	n=143	n=94

Totals less than the denominator are as a result of missing data

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Table 2. Bivariate correlations to explore associations between perceptions of leadership, training, communication, and feeling valued with levels of emotional exhaustion

Variable	1	2	3	4	5	6	7	8	9
1. Age									
2. Gender	-.03 [-.16, .10]								
3. Ethnicity	-.03 [-.16, .10]	-.09 [-.22, .04]							
4. Time at Hospital	.39** [.28, .49]	.09 [-.04, .21]	-.08 [-.21, .04]						
5. Hospital	.14* [.01, .26]	.04 [-.09, .17]	-.39** [-.49, -.27]	.13* [.00, .25]					
6. Training	.10 [-.02, .23]	.12 [-.01, .24]	-.01 [-.14, .12]	.09 [-.04, .21]	.25** [.13, .37]				
7. Communication	.07 [-.06, .19]	.00 [-.13, .13]	-.02 [-.15, .11]	.09 [-.04, .22]	.22** [.09, .34]	.44** [.33, .54]			
8. Leadership	.01 [-.12, .14]	.06 [-.07, .19]	.08 [-.05, .20]	-.01 [-.14, .12]	.08 [-.05, .21]	.49** [.39, .58]	.54** [.44, .63]		
9. Undervalued	.10 [-.03, .23]	-.02 [-.15, .11]	.07 [-.07, .20]	.05 [-.08, .18]	.29** [.17, .41]	.47** [.36, .56]	.50** [.39, .59]	.41** [.29, .51]	
10. Emotional Exhaustion	-.02 [-.15, .11]	-.00 [-.14, .13]	.02 [-.11, .15]	.09 [-.04, .22]	.16* [.04, .29]	.44** [.33, .54]	.36** [.24, .47]	.35** [.23, .46]	.59** [.49, .67]

Note. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * indicates $p < .05$. ** indicates $p < .01$.

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Table 3: Multiple linear regression results exploring the associations between perceptions of leadership, training, communication, and feeling valued with levels of emotional exhaustion, while controlling for location of redeployment

Factor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	1.32**	[0.78, 1.89]						
Hospital	-0.08	[-0.38, 0.22]	-0.03	[-0.14, 0.08]	.00	[.00, .02]	.16*	
Leadership	0.07	[-0.07, 0.20]	0.07	[-0.07, 0.20]	.00	[.00, .02]	.35**	
Training	0.19**	[0.05, 0.32]	0.20	[0.05, 0.33]	.03	[.00, .07]	.44**	
Communication	-0.01	[-0.16, 0.15]	-0.01	[-0.17, 0.15]	.00	[.00, .02]	.35**	
Undervalued	0.43**	[0.29, 0.58]	0.48	[0.33, 0.62]	.15	[.07, .25]	.58**	
								R^2 = .379**
								95% CI[.28,.50]

Note. A statistically significant b-weight indicates the beta-weight and semi-partial correlation are also statistically significant. b represents unstandardized regression weights. beta indicates the standardized regression weights. sr2 represents the semi-partial correlation squared. r represents the zero-order correlation. LL and UL indicate the lower and upper limits of a confidence interval, respectively.
* indicates p < .05. ** indicates p < .01.

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Figure 1: Comparison of the number of respondents in each hospital who endorsed experiencing morally distressing situations

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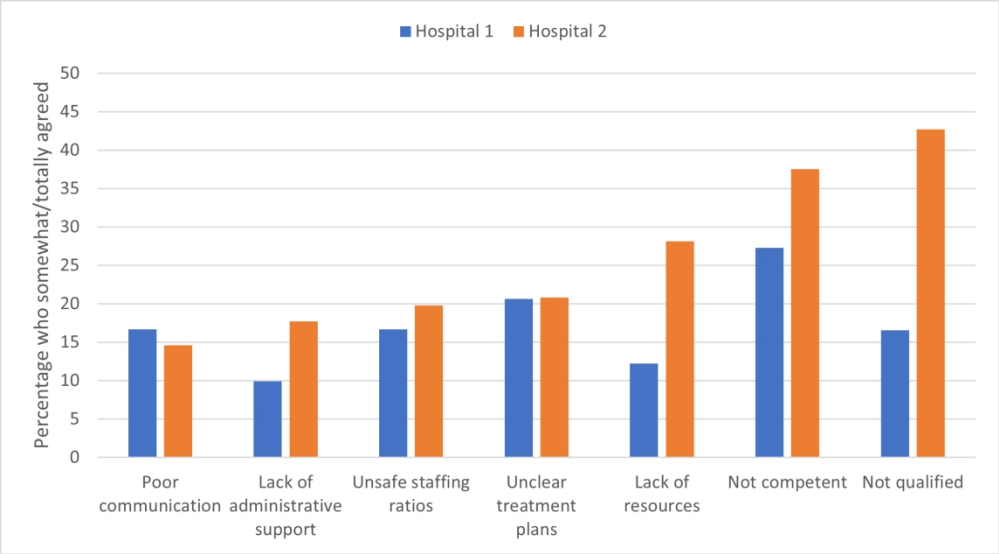

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Supplemental file

Redeployment Questionnaire

	Totally disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Totally agree
1. I did not want to be redeployed	○	○	○	○	○
2. I was prepared to work where I was needed	○	○	○	○	○
3. I was nervous about my new role	○	○	○	○	○
4. I volunteered (opted-in) to be redeployed	○	○	○	○	○
5. A clear process for redeployment was implemented	○	○	○	○	○
6. It was my professional duty to work where I have been asked to work	○	○	○	○	○
7. I felt personally compromised by a lack of personal protective equipment (PPE) provided to me	○	○	○	○	○
8. Redeployment training received was thorough and comprehensive	○	○	○	○	○
9. I was not prepared emotionally to work in ITU/area of redeployment	○	○	○	○	○
10. I found it hard to ask for help	○	○	○	○	○
11. I engaged in selfcare	○	○	○	○	○
12. My team prioritized self-care	○	○	○	○	○
13. I feel overwhelmed in the role I have been redeployed to	○	○	○	○	○
14. I cannot cope emotionally with caring for people who are dying	○	○	○	○	○
15. New opportunities are available which wouldn't have been otherwise	○	○	○	○	○
16. I have changed my priorities about what is important in life	○	○	○	○	○
17. My skills were considered for my reassigned role	○	○	○	○	○
18. I am confident in the role I have been reassigned to	○	○	○	○	○
19. I have had to work outside my scope of practice	○	○	○	○	○
20. I lack recent clinical experience to provide acute care	○	○	○	○	○
21. I have bonded well with my new team	○	○	○	○	○
22. There is someone I can turn to for advice or assistance	○	○	○	○	○
23. Others understand what I am going through	○	○	○	○	○
24. I would like to continue in this role post-COVID	○	○	○	○	○

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25. I felt I had a choice regarding the details around my redeployment	○	○	○	○	○
26. I was given enough notice regarding my redeployment	○	○	○	○	○
27. I was not consulted on the changes to my work hours	○	○	○	○	○
28. My underlying health condition was not considered when redeployed	○	○	○	○	○
29. Opting out of redeployment would be perceived as cowardice	○	○	○	○	○
30. Opting out of redeployment would have led to feelings of guilt	○	○	○	○	○
31. My colleagues have been rude and unhelpful	○	○	○	○	○
32. I felt isolated and under-prepared	○	○	○	○	○
33. I have not had the supervision I require	○	○	○	○	○
34. I worry about my family's safety	○	○	○	○	○
35. Redeployment has had a negative effect on my home life	○	○	○	○	○
36. Communication was clear throughout my redeployment	○	○	○	○	○
37. Redeployment was done without consideration of my family circumstances	○	○	○	○	○
38. I feared criticism if I spoke up about my concerns	○	○	○	○	○
39. I should have done more to help	○	○	○	○	○
40. Redeployment has made me want to leave my profession	○	○	○	○	○
41. I have lost confidence in the organization	○	○	○	○	○
42. I feel undervalued	○	○	○	○	○
43. The atmosphere among my colleagues was supportive	○	○	○	○	○

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Table S1: Comparison between the two hospitals on whether participants were prepared for redeployment

	All participants				HOSPITAL 1				HOSPITAL 2				Significance
	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	
Not a professional duty to be redeployed	237	187 (79)	25 (11)	25 (11)	141	110 (78)	16 (11)	15 (11)	96	77 (80)	9 (9)	10 (10)	0.88
Not prepared to work where needed	234	169 (72)	19 (8)	46 (20)	140	101 (72)	11 (8)	28 (20)	94	68 (72)	8 (9)	18 (19)	0.98
Not consulted in change to work hours	231	127 (55)	45 (20)	59 (26)	135	82 (61)	19 (14)	34 (25)	96	45 (47)	26 (27)	25 (26)	0.03
Did not want to be redeployed	236	98 (42)	50 (21)	88 (37)	142	68 (48)	27 (19)	47 (33)	94	30 (32)	23 (25)	41 (44)	0.05
Underlying health not considered	228	87 (38)	99 (43)	42 (18)	133	59 (44)	52 (39)	22 (17)	95	28 (30)	47 (50)	20 (21)	0.07
Did not volunteer	231	86 (37)	53 (23)	92 (40)	138	68 (49)	29 (21)	41 (30)	93	18 (19)	24 (26)	51 (55)	<0.001
Insufficient training	237	88 (37)	44 (19)	105 (44)	141	63 (45)	29 (21)	49 (35)	96	25 (26)	15 (16)	56 (58)	0.001
Family circumstances not considered	229	84 (37)	55 (24)	90 (39)	133	59 (44)	30 (23)	44 (33)	96	25 (26)	25 (26)	46 (48)	0.01
Unclear communication	233	72 (31)	45 (19)	116 (50)	140	51 (36)	20 (14)	69 (49)	93	21 (23)	25 (27)	47 (51)	0.02
Lack of choice	230	60 (26)	19 (8)	151 (66)	134	43 (32)	13 (10)	78 (58)	96	17 (18)	6 (6)	73 (76)	0.02
Insufficient notice	233	79 (34)	40 (17)	114 (49)	137	59 (43)	26 (19)	52 (38)	96	20 (21)	14 (15)	62 (65)	<0.001
Nervous about new role	233	29 (12)	29 (12)	175 (75)	139	20 (14)	19 (14)	100 (72)	94	9 (10)	10 (11)	75 (80)	0.38

Table S2: Comparison between the two hospitals on whether participants felt they were safe and supported

	All participants				HOSPITAL 1				HOSPITAL 2				Significance
	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	
Unsupportive atmosphere	228	157 (69)	33 (15)	38 (17)	132	106 (80)	16 (12)	10 (8)	96	51 (53)	17 (18)	28 (29)	<0.001
Rude and unhelpful colleagues	228	154 (68)	35 (15)	39 (17)	132	107 (81)	12 (9)	13 (10)	96	47 (49)	23 (24)	26 (27)	<0.001
No understanding by others of the experience	230	151 (66)	42 (18)	37 (16)	134	99 (74)	24 (18)	11 (8)	96	52 (54)	18 (19)	26 (27)	<0.001
Did not bond with new team	232	151 (65)	50 (22)	31 (13)	136	107 (79)	21 (15)	8 (6)	96	44 (46)	29 (30)	23 (24)	<0.001
Team did not prioritise self-care	226	99 (44)	75 (33)	52 (23)	130	72 (55)	43 (33)	15 (12)	96	27 (28)	32 (33)	37 (39)	<0.001
Communication was unclear	230	78 (34)	26 (11)	126 (55)	134	55 (41)	19 (14)	60 (45)	96	23 (24)	7 (7)	66 (69)	0.001

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Table S3: Comparison between the two hospitals on whether participants perceived themselves to be competent to work in the areas they were deployed to

	All participants				HOSPITAL 1				HOSPITAL 2				Significance
	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	
Lacked confidence in new role	231	137 (59)	28 (12)	66 (29)	135	98 (73)	15 (11)	22 (16)	96	39 (41)	13 (14)	44 (46)	<0.001
Skills not considered	230	127 (55)	32 (14)	71 (31)	134	86 (64)	17 (13)	31 (23)	96	41 (43)	15 (16)	40 (42)	0.004
Working out of scope of practise	232	102 (44)	27 (12)	103 (44)	136	72 (53)	16 (12)	48 (35)	96	30 (31)	11 (12)	55 (57)	0.002
Lacking experience in acute clinical care	231	95 (41)	47 (20)	89 (39)	135	59 (44)	24 (18)	52 (39)	96	36 (38)	23 (24)	37 (39)	0.45
Emotional unprepared for ITU/area of redeployment	237	90 (38)	61 (26)	86 (36)	141	63 (45)	33 (23)	45 (32)	96	27 (28)	28 (29)	41 (43)	0.04

ITU: intensive care unit

Table S4: Comparison between the two hospitals on participants reflections of being redeployed

	All participants				HOSPITAL 1				HOSPITAL 2				Significance
	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	
No change to life priorities	229	159 (69)	42 (18)	28 (12)	133	97 (73)	21 (16)	15 (11)	96	62 (65)	21 (22)	13 (14)	0.38
Could not do more	229	150 (66)	45 (20)	34 (15)	133	76 (57)	26 (20)	31 (23)	96	74 (77)	19 (20)	3 (3)	<0.001
Want to leave the profession	229	126 (55)	38 (17)	65 (28)	133	86 (65)	19 (14)	28 (21)	96	40 (42)	19 (20)	37 (39)	0.02
Lost confidence in the organisation	229	126 (55)	40 (18)	63 (28)	133	89 (67)	20 (15)	24 (18)	96	37 (39)	20 (21)	39 (41)	<0.001
No new opportunities available	228	109 (48)	66 (29)	53 (23)	132	67 (51)	39 (30)	26 (20)	96	42 (44)	27 (28)	27 (28)	0.32
Wat to return to normal role	229	27 (12)	39 (17)	163 (71)	134	15 (11)	26 (19)	93 (69)	95	12 (13)	13 (14)	70 (74)	0.52

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Table S5: Comparison between the two hospitals on the emotional impact of being redeployed

Rename	All participants				HOSPITAL 1				HOSPITAL 2				Significance
	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	n	Disagree	Neither	Agree	
Unable to cope with patient death	230	164 (71)	34 (15)	32 (14)	134	90 (67)	21 (16)	23 (17)	96	74 (77)	13 (14)	9 (9)	0.18
No one to turn to for advice	231	157 (68)	42 (18)	32 (14)	135	105 (78)	20 (15)	10 (7)	96	52 (54)	22 (23)	22 (23)	<0.001
Compromised by lack of PPE	236	161 (68)	37 (16)	38 (16)	141	94 (67)	23 (16)	24 (17)	95	67 (71)	14 (15)	14 (15)	0.82
Unable to ask for help	236	150 (64)	29 (12)	57 (24)	140	100 (71)	19 (14)	21 (15)	96	50 (52)	10 (10)	36 (38)	<0.001
I did not engage in selfcare	226	132 (58)	59 (26)	35 (16)	130	88 (68)	27 (21)	15 (12)	96	44 (46)	32 (33)	20 (21)	0.004
Inadequate supervision	228	119 (52)	30 (13)	79 (35)	132	84 (64)	16 (12)	32 (24)	96	35 (37)	14 (15)	47 (49)	<0.001
Feeling isolated and underprepared	228	112 (49)	26 (11)	90 (40)	132	83 (63)	19 (14)	30 (23)	96	29 (30)	7 (7)	60 (63)	<0.001
Fear criticism for voicing concerns	229	104 (45)	35 (15)	90 (39)	133	74 (56)	20 (15)	39 (29)	96	30 (31)	15 (16)	51 (53)	<0.001
Feeling undervalued	225	96 (43)	35 (16)	94 (42)	131	74 (57)	17 (13)	40 (31)	94	22 (23)	18 (19)	54 (57)	<0.001
Feeling overwhelmed	229	91 (40)	41 (18)	97 (42)	133	66 (50)	26 (20)	41 (31)	96	25 (26)	15 (16)	56 (58)	<0.001
Negatively affected home life	227	84 (37)	44 (19)	99 (44)	131	56 (43)	24 (18)	51 (39)	96	28 (29)	20 (21)	48 (50)	0.11
Shame if opted out	230	57 (25)	64 (28)	109 (47)	134	37 (28)	39 (29)	58 (43)	96	20 (21)	25 (26)	51 (53)	0.31
Worry about family's safety	228	57 (25)	22 (10)	149 (65)	132	39 (30)	8 (6)	85 (64)	96	18 (19)	14 (15)	64 (67)	0.03
Guilt if opted out	230	42 (18)	42 (18)	146 (64)	134	25 (19)	26 (19)	83 (62)	96	17 (18)	16 (17)	63 (66)	0.89

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Separate file
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	3
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	NA
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	3/4
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	3/4
Bias	9	Describe any efforts to address potential sources of bias	NR
Study size	10	Explain how the study size was arrived at	NR
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	4
		(*b*) Describe any methods used to examine subgroups and interactions	NA
		(*c*) Explain how missing data were addressed	NR
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	NA
		(*e*) Describe any sensitivity analyses	NA

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Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1
		(b) Indicate number of participants with missing data for each variable of interest	Supplemental file
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	NA
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	NA
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	NA
		Cross-sectional study—Report numbers of outcome events or summary measures	Supplemental file
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	5-7
		(*b*) Report category boundaries when continuous variables were categorized	NA
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	7
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	9
Generalisability	21	Discuss the generalisability (external validity) of the study results	NR
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Title page

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at

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http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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