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Ethnic disparities in health & social care workers' exposure, protection, and clinical management of the COVID-19 pandemic in the UK

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ABSTRACT

This paper examines determinants of ethnic disparities in workplace risks of COVID-19 among health and social care workers (HCWs) in the UK. This was undertaken to inform public health policy in the management of COVID-19 relating to health and social care provision. A cross-sectional survey was administered in July–August 2020 ($n = 456$) to elicit HCWs' experiences of COVID-19 management in the workplace and their perceptions of exposure, personal protection against infection, involvement in local clinical management, and other workplace hazards. Findings suggest minority ethnic HCWs were twice as likely as White HCWs to be in a patient-facing role (OR = 2.14, 95% CI: 1.21; 3.78, $P < 0.01$) and twice as likely (63% vs 39%) to be caring for COVID-19 positive patients (OR = 2.68, 95% CI: 1.77; 4.06, $P < 0.01$). Those in nursing, were three times as likely to be redeployed to a COVID-19 care setting (OR = 3.33, 95% CI: 1.23; 9.02, $P = 0.02$). Minority ethnic HCWs within lower- and mid-level roles carried a higher burden of frontline clinical management of COVID-19 positive patients than their White counterparts. This study found evidence of ethnic disparities across several workplace hazards, with increased exposure to and less protection against infection, more responsibility for the clinical management of infection, and evidence of systemic racial bias in the disproportionate redeployment of minority ethnic nursing staff to COVID-19 areas. An NHS-wide review is required to assess procedural fairness, ensure safe practices now, and to avert future crises.

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Introduction

The global outbreak of COVID-19 placed unprecedented strain on health-care services, with more than 3 million deaths worldwide as of 20 April 2021 (World Health Organisation [WHO], 2021). With

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 Supplemental data for this article can be accessed here.

more than 127,000 deaths by April 2021, the UK was severely affected by COVID-19, ranking third in Europe in mortality rate.

Emerging evidence in the UK (Leach et al., 2021; Platt & Warwick, 2020; Rimmer, 2020) and the US (Clements, 2020; Mahajan & Larkins-Pettigrew, 2020) suggests an excess burden of infection rates, mortality and need for intensive care among ethnic minorities. These ethnicity-based disparities are also evidenced among health and social care workers (HCWs). Reports indicate a disproportionately raised risk of death in the UK among minority ethnic staff compared with those of White ethnicity, accounting for 67% of all health workers' mortality (Office of National Statistics [ONS], 2020a; West & Bailey, 2020) despite making up only 22.3% of the total health and care workforce (National Health Service [NHS], 2020). Their overrepresentation in COVID-19 fatalities and risk of infections (Raifman & Raifman, 2020; Yancy, 2020) led to growing concerns and calls for enquiry into ethnic/racial inequalities in the burden of COVID-19. Yet, to date few empirical studies have examined experiences of staff and workplace management of COVID-19 in the UK or the influence of ethnicity on workplace hazards of and protections against COVID-19.

Addressing this gap, a group of academics and practitioners came together under the umbrella of the I-COPE¹ consortium to examine HCWs' experiences and the workplace factors that influence their vulnerabilities and perceptions of risk to COVID-19 infection and mortality. Khunti et al. (2021) proposed a framework for assessing workplace risk of COVID-19 in terms of exposure, specific care sector, effective personal protection, redeployment, and demographic composition across high-risk roles. The study reported in this paper assessed these workplace hazards utilising an intersectionality lens to explore ethnic disparities and their interactions with other aspects of social location and clinical position. HCWs' participation in policy generation and implementation and the relative influence on HCWs' vulnerabilities and risk to infection and mortality were also explored. Of particular interest was the role of ethnicity in shaping these experiences. We adopted an intersectional lens that examined HCWs' susceptibility based on multiple deprivations related to gender, professional role/cadre, employment conditions and other socioeconomic factors.

Ethnicity in context

Reports indicate that minority ethnic groups are more often exposed to and diagnosed with COVID-19 (ONS, 2020a) (486 and 649 diagnoses per 100 000 population in females and males, compared to 220 and 224 per 100 000 in White populations) (Public Health England [PHE], 2020a), and have been over-represented in lower-paid and less secure employment (Nazroo & Bécares, 2021) and key worker roles throughout the pandemic (Elwell-Sutton et al., 2020). Explanations for ethnic differences in infection and fatality among HCWs are scant and tend to focus on their predisposition to certain chronic diseases or 'Covid-risky' comorbidities (Kumar et al., 2020), and inhabiting densely populated areas (PHE, 2020a). A few studies have investigated the structural and upstream basis of these inequalities. For example, it is evident that there is over-representation of HCWs from ethnic minorities in less valued but essential people-facing roles within the National Health Service (NHS) that cannot be done remotely (Curry et al., 2020), and there is evidence of ongoing racial discrimination at work that prevents negotiation around risky responsibilities and role progression (Kirby, 2020; Mahajan & Larkins-Pettigrew, 2020). A BMA (2020) survey found that minority ethnic doctors in the NHS were twice as likely to feel pressured to see patients in high-risk clinical settings without adequate personal protective equipment (PPE) than their White counterparts, suggesting greater exposure to infection. Public Health England (PHE) acknowledged that 'historical racism' and fear of adverse consequences may prevent NHS staff from minority ethnic groups 'to speak up when they have concerns about PPE or risk' (PHE, 2020b, p. 5). Yet, there has been no systematic assessment of how minority ethnic groups experience COVID-19 management in NHS and other Social Care organisations or of the full range of factors that shape their ability to protect themselves. The Office of National Statistics (ONS) data suggests that being in a low-skilled occupation appears to increase the levels of exposure and the risks of contracting COVID-19 infection (ONS, 2020b).

However, PHE reviews of the impact of COVID-19 on minority ethnic groups and disparities in the risks and outcomes (PHE, 2020a, 2020b) failed to systematically investigate the reasons behind the disparities in risky roles and occupations or acknowledge structural and institutional discrimination (Patel et al., 2020), nor address whether these ethnic disparities are explained by other causal factors, such as professional cadre and job seniority.

Further, existing studies have neglected the specificities of age, gender and job profiles/roles of minority ethnic health and social care workers, thus limiting their ability to consider what accounts for differences between groups (Kapilashrami & Bhui, 2020). Intersectionality has been proposed as a useful approach to understand COVID-19 disparities (Hankivsky & Kapilashrami, 2020) as it explicitly incorporates examination of the interaction of various factors (e.g. age, sex, gender, health status, geographic location, migration status, race/ethnicity, and socioeconomic status) that shape risks and burden of infection (Kapilashrami & Hankivsky, 2018). This study examined the effect of ethnicity in relation to combinations of factors, including reported ethnicity, nationality, new migrant/ diaspora, age and seniority, and explored the role of these in cumulatively influencing hazard exposure and protections among staff.

Methods

Study population and data collection

An online cross-sectional survey of health and social care workers across the UK explored disparities in exposure, protection, and clinical responsibility during the COVID-19 first wave. The survey questionnaire was developed and administered in Qualtrics by members of the consortium (AK, AV, DO, KB) and contained questions on socio-demographics, descriptive variables about clinical role, and workplace risks of COVID-19 (e.g. exposure, protection, and clinical management responsibilities). HCWs across the UK were invited to complete this online survey through a link disseminated via social media and UK health and social care organisations in July–August 2020. This facilitated snowball sampling and allowed a rapid turnaround to capture the dynamics of frequent workplace changes during the first peak of the COVID-19 pandemic. Some survey questions allowed free-text responses to investigate issues further. The survey was accessed by 540 respondents and completed by a total of 456 respondents.

Study variables

Ethnicity was self-reported using UK national Census categories, with the option to further self-define under 'other'. Self-reports under these categories were coded as Asian (and Arab) (including Arab, Chinese British, Indian British, Pakistani British, Mixed White and Asian, other Asian backgrounds), Black (including Black African, Black British, Black Caribbean, Mixed White and Black African or Caribbean), and White (including White British, and White Other). For regressions, ethnicity was coded as a binary variable – 'minority ethnic' (comprising of Black and Asian ethnic groups) vs White. Gender, nationality, migrant status (expressed as years living in the UK), and residential postcode were self-reported. The Townsend Material Deprivation Index (Townsend et al., 1988) of residential postcode was used to measure area deprivation (Norman, 2010; Yousaf & Bonsall, 2017). It was calculated using the UK 2011 National Census Data obtained from Nomis Key Statistics (Office for National Statistics [ONS], n.d.) and Scotland 2011 Census Data (Scotland Census, 2011) matched to the residential postcode sector. The index was categorised into quintiles (1 = least deprived to 5 = most deprived) because it measures relative deprivation and the raw score cannot be easily interpreted. Categorisation conforms with the original methodological approach adopted in the creation of the index (Norman, 2010; Yousaf & Bonsall, 2017).

To capture seniority in occupational roles, a composite measure was calculated using: job title, years of experience, and highest qualification (professional or otherwise). Three assessors (AV, BE, JP)

independently assigned, first, 50 respondents into junior (to include assistant and support roles, 13% of whom held a professional clinical qualification), mid-level (95% of whom held >6 years' experience, and 38% professional clinical qualification), and senior roles (to include managers, leads and consultants; 94% of whom held >10 years' experience, and 65% a professional qualification). A 78% agreement rate was achieved between the three assessors; conflicts were resolved by three-way discussion. Subsequently, to improve the robustness of the seniority scores all remaining respondents were jointly scored by two of the three assessors (AV, BE).

Eight outcome measures were investigated, grouped under three categories of workplace hazards, that is workplace features that increase the risk of COVID-19 (referred to collectively as workplace hazards throughout the paper):

- (1) Exposure to COVID-19 infection in the workplace was measured via three variables: i) working in an area with COVID-19 cases; ii) being redeployed to COVID-19 clinical areas; and iii) working in a patient-facing role.
- (2) Protection against COVID-19 infection at work, measured via four variables: i) adequacy of access to PPE; ii) timely awareness of COVID-19 protective guidelines; iii) receipt of in-person training in correct PPE use; and iv) timeliness of availability of COVID-19 testing for staff. Awareness of COVID-19 guidelines and testing availability were assessed temporally and categorised into 'aware at start of the pandemic' (i.e. early Feb to early March 2020), 'aware during the peak' (late March to late April 2020), 'aware at decline of the peak' (early May through June 2020), and 'not aware'.
- (3) Involvement in decision-making related to COVID-19 clinical management with three levels of responsibility for either patient management, staffing management, or implementing clinical practices in relation to PPE use.

Data analysis

Analysis was carried out in five steps. First, distributions of all variables, including outcomes (i.e. workplace COVID-19 hazards) and socio-demographic variables were examined in the sample. Second, the distribution of workplace hazards was examined across minority ethnic status to identify disparities. Third, ethnic differences in these workplace hazards were estimated, both with and without adjustment for additional explanatory variables, and interactions with ethnicity to explore intersectional disadvantage. Fourth, mediation models explored whether ethnic disparities in workplace hazards persisted after mediating for other variables known to explain disparities in workplace COVID-19 hazards, including job seniority, being in a nursing role, and working in a secondary care sector/in a COVID-19 area. Fifth, free-text comments from the survey were analysed thematically to further understand the quantitative results. Extracts are presented under key themes below.

Distributions of socio-demographic characteristics were displayed to discuss the representativeness of the sample (Supplementary Material Table 2, column 3) and demographic and workplace variables were tabulated across ethnicity to identify ethnic disparities (Supplementary Material Table 2, columns 1 & 2).

The eight outcome measures were assessed, in turn, with minority ethnic status as the main independent variable to calculate risk estimates for minority ethnic HCWs vis-à-vis their White counterparts. Binary workplace hazard variables were analysed using logistic regression producing odds ratios; multi-category workplace hazard variables were analysed using multinomial logistic regression producing relative risk ratios (95% confidence intervals). Both univariate ethnic disparities and adjusted models were estimated. Explanatory variables included in the adjusted models were nursing role (i.e. a dichotomy of nursing/midwifery compared to all other disciplines), care sector, deprivation, gender, and age. These were chosen for their relevance to the outcome measures, that is workplace hazards, which sought to further explain personal attributes as drivers of workplace disparities.

Interactions between ethnicity and other explanatory variables, including i) being in a nursing role and ii) job seniority, were assessed in turn to estimate if the ethnicity effect was moderated by these factors – significance was measured at the $\alpha < 0.05$ level.

We then considered job seniority, nursing role and care sector as mediators of ethnic disparities, to explore whether ethnic disparities persisted after accounting for other known drivers of workplace disparities. Mediator variables were chosen due to either their interaction effect with ethnicity in the adjusted models, or additional explanatory effects in the adjusted models. Years of experience was excluded from all models due to being correlated with job seniority ($\rho = 0.59$) (see Supplementary Material Table 1). Analyses were conducted in Stata 14. Mediation models were conducted as logistic decompositions using the 'ldecomp' command.

Results

Demographics of our survey respondents

Among the 456 HCWs who completed the survey, most (73% of 456) worked in secondary care, with the remaining 27% equally divided between social care ($n = 61$) and primary care ($n = 64$) (see Supplementary Material Table 2). Most worked in Nursing/Midwifery (32%) and Medicine/Dentistry (27%), and fewer in non-clinical/social care (11.6%), administrative (13.8%), and allied health (15.8%). In terms of seniority and experience, 27% were in senior roles, 41% in mid-level, and 32% were in junior roles (Supplementary Material Figure 1); 67% respondents held over 10 years' experience, 13% had 6–10 years, 13% 2–5 years, and 7% had less than less than 2 years' experience.

Demographically, 70.2% ($n = 320$) self-identified as White, 15.4% ($n = 70$) as Asian and Arab, and 14.5% ($n = 66$) as Black. Most respondents were born in the UK (67.5%, $n = 308$) and identified as female (75%, $n = 344$) (Supplementary Material Figure 1). Only 1% ($n = 5$) identified as Trans or non-binary and, given the small sample size, they were omitted from adjusted models to protect confidentiality. Females were more often in junior roles than males (RR = 1.82 (95%CI: 1.04; 3.21), $P = 0.04$) but no more likely than males to work in primary (80%), secondary (75%), or social care (78%). Among ethnic minorities, 23.5% ($n = 32$) were UK-born, and 77% ($n = 104$) were first-generation migrants, most of whom (76%, $n = 79$) had lived in the UK for more than 10 years. Ethnic minority HCWs were disproportionately living in higher deprivation areas with 46% ($n = 62$) living in the most deprived areas, compared to 36% ($n = 116$) of White respondents ($\chi^2 = 10.42$ (df = 4), $P = 0.03$). Ethnic minority HCWs had a higher proportion of males ($n = 57$, 42%), compared to White HCWs ($n = 50$, 16%), ($\chi^2 = 38.15$ (df = 1), $P < 0.01$). Ethnic minority HCWs were more likely working in medical/dental roles ($n = 70$, 51%) and nursing/midwifery ($n = 36$, 26%), whereas White HCWs were most likely to be working in nursing/midwifery ($n = 110$, 34%), and were otherwise evenly distributed across professional cadres (12–20%). Ethnicity was not associated with job seniority.

Workplace hazards

The first two columns of Table 1 display the distribution of minority ethnic HCWs and their White counterparts across different workplace hazards, that is the eight outcome measures. The third and fourth columns report the risk estimates of minority ethnic HCWs vis-à-vis White HCWs for these workplace hazards using unadjusted and adjusted models, respectively. Significant mediation models are shown in Figure 1; the others are shown in Supplementary Material Figure 2.



Table 1. Workplace risks by ethnicity, and risk estimates for minority ethnic health-care workers (HCWs) compared to white ethnic HCWs.

Workplace hazards (modelled as dependent variables)	Ethnic minority HCWs (n = 136)		White HCWs (n = 320)		Risk estimates ^a for ethnic minorities compared to white HCWs	
	n	(column %)	n	(column %)	Univariate Risk (95% CI)	Adjusted ^b Risk (95%CI)
Patient facing role						
Yes	119 (87.5)		245 (76.6)		2.14 (1.21 to 3.79)**	1.98 (1.07 to 3.69)*
No	17 (12.5)		75 (23.4)		1.00	1.00
Working in area with COVID-19 cases						
Yes	86 (63.2)		125 (39.1)		2.68 (1.77 to 4.06)**	2.66 (1.44 to 5.51)**
No	50 (36.8)		195 (60.9)		1.00	1.00
Redeployed to COVID area						
Yes	123 (90.4)		303 (94.7)		1.88 (0.89 to 4.00)	1.58 (0.68 to 4.32)
No	13 (9.6)		17 (5.3)		1.00	1.00
Availability of PPE						
Adequate	70 (51.5)		160 (50.0)		1.00	1.00
Not adequate	30 (22.0)		81 (25.3)		0.85 (0.51 to 1.41)	0.75 (0.43 to 1.29)
Undecided/unknown	28 (20.6)		61 (19.1)		1.05 (0.62 to 1.78)	0.94 (0.53 to 1.68)
No response	8 (5.9)		18 (5.6)		-	-
Aware of PPE policies						
Start of pandemic	3 (2.2)		114 (35.6)		1.00	1.00
Peak of pandemic	65 (47.8)		180 (56.3)		0.62 (0.41 to 0.95)*	0.68 (0.43 to 1.07)
Decline of pandemic	64 (47.0)		16 (5.0)		0.44 (0.14 to 1.37)	0.48 (0.14 to 1.67)
Not aware	4 (3.0)		10 (3.1)		0.53 (0.14 to 1.98)	0.32 (0.06 to 1.70)
Testing for staff						
Start of first peak	6 (4.4)		29 (9.1)		1.00	1.00
During first peak	88 (64.7)		92 (60.0)		2.22 (0.89 to 5.53)	2.46 (0.94 to 6.47)
Decline of first peak	42 (30.9)		99 (30.9)		2.05 (0.79 to 5.30)	2.58 (0.94 to 7.09)
Training on PPE						
In person	57 (38.2)		75 (23.4)		2.05 (1.17 to 3.60)*	2.12 (1.16 to 3.90)*
Online/handouts	52 (41.9)		172 (53.8)		0.82 (0.48 to 1.40)	0.84 (0.47 to 1.50)
No training	27 (19.9)		73 (22.8)		1.00	1.00
Decision making role						
PPE/service plans	69 (51.9)		113 (35.9)		2.19 (1.42 to 3.37)**	2.30 (1.42 to 3.71)**
Staffing/roles	11 (8.3)		15 (4.8)		2.63 (1.13 to 6.07)*	2.63 (1.04 to 6.63)*
Case management	3 (2.2)		8 (2.5)		1.34 (0.34 to 5.25)	2.17 (0.52 to 9.09)
None	50 (37.6)		179 (56.8)		1.00	1.00

^aRisk estimates: Odds ratios are shown for binary workplace risk variables, and relative risks are shown for multicategory workplace risk variables.

^bAdjusted by nursing role (yes/no), care sector, deprivation, age (≤ 20 , ≤ 30 and $30 >$) and gender.

CI: Confidence interval.

* $P < 0.05$.

** $P < 0.01$.

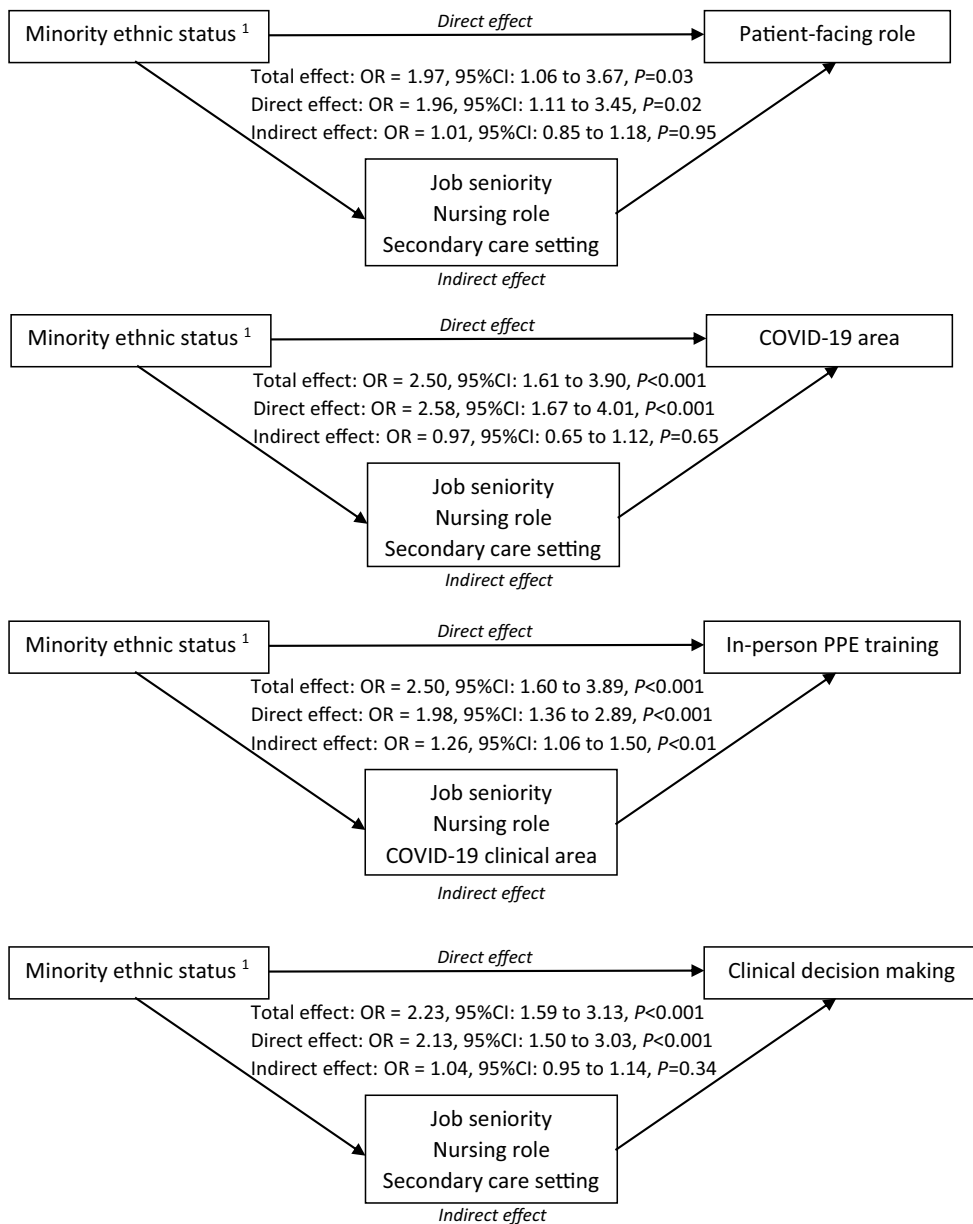


Figure 1. Direct effects of ethnicity on workplace disparities and indirect mediatory effects of job seniority, being in a nursing role, deprivation, and working in secondary care.

Exposure to COVID-19 in the workplace

The risk of exposure to COVID-19 at work was high, with 80% of 456 respondents working in patient-facing roles, and 46% working in a setting caring for people with COVID-19. Minority ethnic HCWs were twice as likely to be working in a patient-facing role (OR = 2.14, 95% CI:1.21; 3.78, $P < 0.01$) than White HCWs. Other significant explanatory variables of working in a patient-facing role in the adjusted model were nursing role (adjusted OR = 2.81, 95%CI:1.53; 5.18, $P = 0.001$), and working in primary care (adjusted OR = 2.81, 95%CI:1.14; 6.96, $P = 0.03$). An interaction with job seniority indicated that ethnic minorities in senior roles were nearly four times

as likely to be working in patient-facing roles as their White counterparts (OR = 3.83, 95% CI:1.05 to 13.77, $P = 0.04$), indicating that White HCWs in senior roles were less exposed than senior minority ethnic HCWs. Ethnic disparities were sustained in the mediation model when controlling for age, gender, and deprivation and mediating by nursing roles, job seniority, and care sector (i.e. primary, secondary or social care) (direct effects OR = 1.96, 95%CI:1.11; 3.45, $P = 0.03$) (see Figure 1).

Minority ethnic HCWs were twice as likely as white HCWs to work in areas with COVID-19 cases (OR = 2.68, 95% CI:1.77; 4.06, $P < 0.01$), this finding was sustained in the adjusted model. Other significant explanatory variables in the adjusted model were under 30 years of age (adjusted OR = 2.80, 95%CI:1.42; 5.53, $P = 0.03$), nursing role (adjusted OR = 1.68, 95%CI:1.08; 2.62, $P = 0.02$), and working in social care (adjusted OR = 0.19, 95%CI:0.08; 0.41, $P < 0.001$). There was a significant interaction between ethnicity and job seniority, such that minority ethnic senior and junior HCWs were 4 and 3 times, respectively, more likely to be working with patients with COVID-19, compared to White senior HCWs (adjusted OR = 3.92, 95% CI: , $P = 0.002$ for senior HCWs; adjusted OR = 2.74, 95% CI:1.04; 7.23, $P = 0.04$ for junior staff). Ethnic disparities persisted in the mediation model when controlling for age, gender, and deprivation and mediating by nursing roles, job seniority, and working in secondary care (compared to primary and social care) (direct effects: OR = 2.58, 95% CI:1.67; 4.01, $P < 0.001$) (see Figure 1).

Whilst minority ethnic HCWs overall were no more likely than White HCWs to be redeployed, minority ethnic in nursing roles were three times as likely to be redeployed than white nursing staff (OR = 3.33, 95% CI:1.23; 9.02, $P = 0.02$), which was sustained in the adjusted model (adjusted OR = 3.26, 95% CI:1.36; 9.37, $P = 0.03$).

Protection against COVID-19

Accessibility of PPE and awareness of protective guidance at work

HCWs reported inadequacies in the accessibility of PPE use at work ($n = 111$, 26% of 430 respondents) as well as delays in the communication about policy changes in the workplace for use of PPE. Only 39% ($n = 179$ of 456) of HCWs reported being aware of appropriate guidance for using PPE at the start of the pandemic in late February to early March; 53.5% ($n = 244$) reported being aware during the first COVID-19 peak (at the end of March to early April); 4.5% learnt about PPE guidelines only during the decline of the first peak, and 3% ($n = 13$) were not aware at the time of the survey (see Supplementary Material Table 3). However, those working with patients known to have COVID-19 were more likely to be aware of PPE guidelines at the start of the first peak (RR = 4.21, 95%CI: 1.12; 18.85, $P = 0.03$). Similar trends were reported for other guidelines on social distancing, protection of families, and safe patient handling. Notably, 14% and 11% of respondents were not aware of any guidelines for protecting their families or handling of patients, respectively, at the time of the survey.

By professional cadre and seniority level, White junior nurses reported a fourfold likelihood of being aware of the correct use of PPE at the start of the peak, compared to ethnic minority junior nurses (RR: 5.04, 95%CI:1.13; 22.5, $P = 0.03$; adjusted RR: 4.70, 95%CI:1.03; 21.36, $P = 0.045$).

We also examined the frequency of change of PPE guidance, which can adversely affect HCWs by making them feel overwhelmed and confused resulting in poor implementation of protective guidelines. In response to how often PPE guidance changed in the workplace, over half of respondents (56%) reported weekly or fortnightly changes, while 13.6% responded that the guidance changed daily (see Supplementary Material Figure 3). Minority ethnic HCWs were twice as likely as White HCWs to report daily, weekly, or fortnightly changes in PPE practice (RR = 2.27, 95%CI:1.02; 5.05, $P = 0.45$).

HCWs reported being overwhelmed with the frequency of changes to COVID-19 policy and practice. Those in managerial roles found it difficult to support their team in delivering care, and

indicated management failures as they felt changes were not always communicated in a timely fashion:

The daily changes to policy made it difficult to guide and support staff. (White female, senior role in ancillary and estates)

The hospital was 'clumsy' in its dissemination of changing information re PPE, finding out about this from other ward staff rather than management. Social distancing within the hospital has not been followed, with many staff often stuck in small rooms for regular meetings/catchups. (White male, mid-level practitioner in social work)

HCWs reported that they felt that workplace social distancing, PPE requirements, and testing measures were put in place too late, and this failure cost lives. The quotes below raise critical questions around duties of care to staff from managers and others in positions of power, and the impact on HCWs:

In early April PPE was downgraded from ffp3 to medical masks very quickly. No one was being tested and we were getting a lot of suspected cases brought to our ward which was meant to be non COVID. I was fit tested for an ffp3 but was told not to use it on the ward or judged by other staff if I did feel like I wanted extra protection. Now I am back in sexual health and have more PPE here (visors and masks) for well patients. (White female, mid-level practitioner in nursing and midwifery)

I was told to see a COVID patient without extra PPE. When I expressed my concerns, I was dismissed and told I had no right to refuse to see any patient. This was the same day that the ONS data was released on death rates from COVID in ethnic minority groups, with black women having the highest rate. I felt so undervalued and worthless. I had to see that COVID patient but got a colleague to go with me and give me extra hints as to how I could best protect myself. I then had to email management to request a risk assessment which did not take place until a month later. (Black Caribbean female, mid-level practitioner in dentistry)

These quotes emphasise feelings about the lack of support and the potential harm of having to weigh up duty of care and right to protect yourself. Additionally, feelings of being undervalued, not being heard, and fear of dismissal on raising concerns over protection were commonly reported by respondents of minority ethnic origin.

Availability of workplace training on correct use of PPE

Staff reported that the most common mode of training available to them on PPE was via training handouts or online training. Around half (49%) of HCWs received online or self-directed training materials on the correct donning, doffing and disposal of PPE, and 29% received face-to-face training while 22% (n = 100) reported receiving no training. In areas with patients known to have COVID-19, 28% of HCWs reported not receiving any training, while in patient-facing roles, 42% of staff reported not receiving training in PPE. In social care, the common modality of training on correct use of PPE was more likely to be handouts/digital materials (67%, n = 41) rather than in person training (11.5%, n = 7) (RR = 1.42, 95%CI:1.12; 1.82, P = 0.004).

Minority ethnic HCWs were 2.5 times more likely to receive in-person training on correct use of PPE rather than online/self-directed learning, compared to White HCWs (RR: 2.51, 95%CI:1.58; 4.00, P < 0.001; adjusted RR: 2.55, 95%CI:1.543; 4.25, P < 0.001). This finding could be attributed to ethnic minorities being more likely to work in an area caring for people with COVID-19, where in-person training was the common modality rather than online or self-directed training (adjusted RR = 2.82, 95%CI:1.67; 4.78, P < 0.001). Ethnic disparities persisted in the mediation model when controlling for age, gender and deprivation (direct effects: OR = 1.98, 95%CI:1.36; 2.89, P < 0.001), and was significantly mediated by nursing roles, job seniority, and working in a COVID-19 area (indirect effects: OR = 1.26, 95%CI:1.06; 1.50, P < 0.01) (see [Figure 1](#)).

The frequent changes to regular duties and guidance on the use of PPE combined with limited training, as reported by HCWs, demonstrate inconsistency in levels of advice and protocol, suggesting a lack of supportive supervision and preparedness and inability to cope with the transitions, as evidenced in the three following extracts:

There was a lot of confusion on where to use what type of masks since staff are not Mask tested. No training for Agency nurses so one just copies what others are doing hence the risk of infection. (Black African Female, mid-level practitioner in nursing and midwifery)

I didn't feel supported as other aspects of my role required training that was never delivered; in handling PPE etc that was fine, but it felt there was a culture of appeasement and so I felt unable to e.g., ask for everyone to wear masks inside. (Black African Male, student GP/dental practice)

I was redeployed from a ward nurse to become an ITU general and 'covid nurse'. As an ITU nurse, you require highly specialised skills and knowledge to look after the most ill patients. I felt my Hospital Trust provided inadequate teaching to help me and my redeployed co-workers to transition and to prepare to look after critically ill patients competently and safely. My trust provided flash cards and only 3 days of supernumerary before we looked after our own patients independently. This is not enough to teach us basic ITU skills. (Filipino Female, mid-level practitioner in nursing and midwifery)

Availability of workplace testing of COVID-19 infection

Another important safety procedure was the availability of testing for symptomatic HCWs. Only 7.6% reported testing being available to HCWs at the start of the pandemic (Feb-early March), 61.4% had testing access during the first peak (late March to Early April) and 31% were able to test at work at the decline of the first peak (May & June). Again, positively, there were no ethnic disparities in availability of testing. An important finding was that in social care, there was a lag compared with primary and secondary care in that only 2% of staff had testing available at the start of the peak, compared to 52% during the peak, and 46% during the decline.

HCWs felt that the inconsistent testing and poor policies at the start of the peak made them more vulnerable and at higher risk of getting COVID-19 infection.

I was redeployed to dialysis where we were overwhelmed early in the pandemic. Poor organisation at this stage led to chaotic policies, testing restricted, with insufficient swabs. (White female, community hypertension Lead, Nursing and midwifery)

We worked without protective equipment during the early stages and the peak of the pandemic and majority of the staff went ill with the virus. However, we were not tested, and we carried on working spreading infection onto the patients. (White female, specialty Doctor/medical)

Involvement in decision making related to COVID-19 clinical management

Minority ethnic HCWs were more likely to be involved in service level implementation and planning (52%) (OR = 2.19, 95% CI:1.42; 3.37, $P < 0.001$), than white HCWs (36%), and held more staffing and redeployment responsibilities (8% of minority ethnic HCWs) compared to White HCWs (5%), (OR = 2.63, 95% CI:1.13; 6.07, $P = 0.02$). There were no other significant explanatory variables in the adjusted model, except that responsibilities for implementing PPE practices and service planning were more often held by HCWs over 40 years of age (adjusted OR = 2.05, 95%CI:1.31; 3.20, $P = 0.002$). The ethnic disparity persisted when considered across levels of seniority. Minority ethnic HCWs in junior roles were more likely to be involved in decisions for staffing (OR = 3.63, 95%CI:1.55; 8.48, $P = 0.03$; adjusted OR = 4.37, 95%CI:1.74; 1.95, $P = 0.03$), and management of PPE (OR = 3.30, 95% CI:1.48; 7.38, $P = 0.004$; adjusted OR = 4.01, 95%CI:1.67; 9.61, $P = 0.002$), than white junior HCWs. Minority ethnic mid-level HCWs were more likely to have made decisions on PPE implementation and service planning (RR = 3.42, 95%CI:1.68; 6.97, $P = 0.01$; adjusted OR = 3.68, 95%CI:1.75; 7.706, $P = 0.001$), than White mid-level HCWs. These findings indicate an increased burden of responsibility for COVID-19 management in ethnic minority HCWs in lower- and mid-level roles. Ethnic disparities persisted in the mediation model when controlling for age, gender, and deprivation (direct effects: OR = 2.13, 95%CI:1.50; 3.03, $P < 0.001$), despite mediating by other drivers of workplace disparity, that is nursing roles, job seniority, and working in the secondary care sector.

Discussion

Health and social care workers are at the frontline of the fight against COVID-19. They carry a disproportionate burden of care, facing risks to safety due to shortages of personal protective equipment (PPE), and are expected to manage pressures on hospital and staff capacity to manage the surge of COVID-19 patients (Nguyen et al., 2020; Vindrola-Padros et al., 2020). Deviations in proven protective and preventive measures and standardised care increase HCW's overall susceptibility to COVID-19 infection and consequent elevated risks of morbidity and mortality (ONS, 2020b). These realities fuel anxiety and fear of contracting an infection, of failing to provide adequate care for patients, and of carrying the virus home and infecting family and friends (Cawcutt et al., 2020).

This study corroborates these findings. Alarming shortfalls were reported in protecting NHS staff during the COVID-19 pandemic, due to delays in establishing protective practices at the onset of the pandemic crisis and during its peak. Awareness of PPE guidelines (39%), training on the safe use of PPE (22%), and workplace testing for sars-COV-2 (8% overall; only 2% in social care settings) reached fewer HCWs in a timely fashion (i.e. at the rise of the first peak). Considering the high proportion of HCWs in patient facing roles (80%) and areas with known COVID-19 cases (46%), this suggests a significant number of HCWs at-risk were poorly informed and equipped to protect themselves.

We identified ethnic disparities across workplace hazards, with increased exposure to COVID-19 infection, less protection against it, and more responsibility for its clinical management. Minority ethnic HCWs were twice as likely to be in patient-facing roles; twice as likely to be in areas with known COVID-19 cases, and minority ethnic nurses were three times as likely to be redeployed to a COVID-19 area, than White nursing staff. These results highlight ethnicity is a critical consideration when examining workplace risk of COVID-19, evidencing potential explanations of ethnic inequalities in COVID-19 mortality.

Professional role, cadre and seniority were key moderators of ethnic disparities in the exposure to COVID-19. In senior roles, ethnic minorities were four times more likely to work in patient-facing roles and with known COVID-19 cases than White colleagues. This might indicate that ethnic minority staff are less likely to work in non-patient-facing managerial roles as their career progresses compared with white counterparts. The study was not powered to answer this question but might explain a mechanism for sustained COVID-19 exposure throughout the career trajectories of HCWs from ethnic minorities. In junior roles, ethnic minorities were three times as likely to work in areas with COVID-19 cases. At the same time, clinical management of COVID-19 was a higher burden for minority ethnic HCWs. In mid-seniority roles, minority ethnic HCWs were more often implementing PPE guidance and service planning compared to White HCWs. This disparate burden of responsibility might intensify an existing lack of financial reward and recognition – feeling unfairly treated, as well as 'overworked and underpaid' (Marangozov et al., 2017). Furthermore, more frequent delays in becoming aware of PPE guidelines were observed in ethnic minority junior nurses, compared to White junior nursing staff, indicating communication failure and conflicting advice at the frontline. Less experienced HCWs were twice as likely to experience changes in PPE guidance daily, weekly or fortnightly, which fully accounted for the ethnic disparity within less experienced staff. Given the higher rates of minority ethnic staff in the less experienced cadres, this suggests that ethnic minority HCWs were more likely to experience high-frequency changes.

Ethnic disparities persisted despite mediating for other explanations of workplace disparity in the exposure to, protection against, and clinical responsibility for COVID-19 infections; for example, job seniority, social deprivation, gender, being in nursing roles, in secondary care settings and in COVID-19 clinical areas. This suggests ethnic discrimination as a likely explanation for disparity in COVID-19 related workplace hazards, and that such discrimination persists throughout the HSC career trajectory. Recommendations for future study arising from our findings are assessing procedures of allocation and redeployment of HCWs during crisis, as well as examining whether ethnic disparities in workplace hazards predict COVID-19 infection and mortality rates.

Strengths and limitations

This is the first study of its kind to explore risks associated with COVID-19 clinical management in health and social care settings, with a particular focus on ethnicity, professional cadre, social deprivation, and other interacting factors. A strength of this study was capturing HCWs responses in July 2020 – at the decline of the first peak of the COVID-19 pandemic – to capture real-time experiences and perceptions of risk. The survey was distributed through social media and credible workplace networks, which was likely to improve response and credibility. Limitations of generalisability and validity arise from risks of selection bias and recall bias, and rapid snowball sampling rather than probability or random sampling. However, our findings were consistent with other evidenced ethnic disparities (Kirby, 2020; Mahajan & Larkins-Pettigrew, 2020), and the profiles suggest our sample was broadly representative of the workforce. The sample of respondents consisted of 30% ethnic minorities, which was higher than the national average of 20% ethnic minorities in the NHS workforce, and 30% in medical roles (NHS, 2020). The proportion of female HCWs in the study (75% of 456), was representative of the overall NHS workforce (77%).

Conclusion

This study has identified significant weaknesses in the protections for health and social care staff in the UK. We have also identified that workplace risks in the UK were exacerbated for minority ethnic HCWs, whose heightened susceptibility to COVID-19 results from a systemic racial bias in infection exposure and redeployment to COVID-areas. Our findings demonstrate how systemic racism manifests in the health and social care, through shaping the workplace roles of minority ethnic staff and their exposure to workplace hazards. Workplace practices and preventive measures for COVID-19 implemented during the first surge can be understood as manufacturing an avoidable crisis. This suggests the need for an NHS-wide review of the decision-making process and allocation of responsibilities in general. More specifically, we have identified clear evidence of the systematic ways in which minority ethnic staff are put at greater workplace risk, contributing to the well documented higher rates of COVID-19 risk. There are urgent needs for stricter policies for procedural fairness and tackling institutional racism to avert a future crisis.

Note

1. A research consortium was established in May 2020 to examine HSC workers' experience of COVID-19 management and protections at workplace, and investigate the role of ethnicity, gender, role, and other factors in determining these. Led by Kapilashrami, the Intersectional view on Covid-19 Protections & Experiences (I-COPE) consortium comprises researchers from the Universities of Essex, Queen Mary and Leicester as well as practitioners and activists from the NHS and People's Health Movement (UK).

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Author contributions

AK, AV, and KB conceptualised the study and designed the survey with inputs from DO and other members of the I-COPE consortium. DO and AK administered the survey. AK, MO, OA, AN, KB analysed data. All members commented on the draft and approved the final submission.

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