Impact of Covid-19 on lung cancer and mesothelioma specialist nurses: A survey of experiences and perceptions

Sarah Hargreaves [a,*], Karen Clayton [b], Lorraine Creech [c], Liz Darlison [d], Stephanie Ejegi-Memeh [a], Jackie Fenemore [e], Clare Gardiner [a], Bethany Taylor [a], Angela Tod [a]

[a] Mesothelioma UK Research Centre, University of Sheffield, UK
[b] East Cheshire NHS Trust (UK), & LCNUK (Lung Cancer Nursing UK), UK
[c] Mesothelioma, UK
[d] University Hospitals of Leicester (UK), & Mesothelioma UK, UK
[e] The Christie Hospital (Manchester, UK), and LCNUK (lung Cancer Nursing UK), UK

ARTICLE INFO

ABSTRACT

Purpose: The covid-19 global pandemic has impacted on nurses who have rapidly adapted to new ways of working, and experienced negative impacts due to over-stretched services. Two surveys captured the experiences of lung cancer and mesothelioma specialist nurses in the United Kingdom (UK) in 2020, but the impact of later stages of the pandemic was unknown. This study aimed to explore the impact of covid-19 on lung Cancer and mesothelioma nurses since January 2021, the second wave of the pandemic.

Methods: An online cross-sectional survey with both open and closed questions explored the impact of covid-19 on ways of working and workload, quality of care, and health and wellbeing. The survey was open to UK based lung cancer and mesothelioma advanced or specialist nurses.

Results: 85 nurses responded to the survey. The majority were Clinical Nurse Specialists, based in England. Respondents reported changes in ways of working due to redeployment, staff shortages, and home working. Widespread adoption of virtual working practices led to concerns of negative impacts. Perceived excessive workload impacted on care with two-thirds of the sample (57, 67%) reporting they had been unable to provide the same quality of care to patients. Impacts on nurses' health and wellbeing were reported with two-thirds of the sample (56, 66%) reporting a deterioration in emotional wellbeing and mental health. Coping mechanisms employed included online team support to share experiences and increased uptake of exercise; however, impacts on lifestyle and access to coping mechanisms varied.

Conclusion: Nurses have stepped up to the challenges of the pandemic with teamwork and innovation, but pressure arising from the pandemic and high workloads led to negative impacts on wellbeing. The authors have provided recommendations to improve patient care and support the wellbeing of nurses, which will be key to a resilient workforce living with covid-19. Whilst this study focussed on lung cancer and mesothelioma specialists, the findings have wider implications for other cancer specialties.

1. Introduction

In March 2020 a global coronavirus (Covid-19) pandemic was declared by the World Health Organisation (World Health Organization, 2020b) placing healthcare systems under great pressure. Whilst UK health services aimed to maintain cancer treatments during the pandemic (Stevens, 2020) there was widespread disruption. It is estimated that 40,000 fewer patients than expected started cancer treatment in the UK in 2020 (Roberts, 2021), and 50,000 fewer people were

diagnosed with cancer (MacMillan Cancer Support, 2020). By 2021 this backlog led to increased urgent cancer referrals; growing waiting lists for diagnostic tests; delays in cancer treatments (Davies, 2021; Nicola J. Roberts et al., 2021; Round et al., 2021); and limited access to clinical trials (Iacobucci, 2021; Nicola J. Roberts et al., 2021). New planning guidance was initiated in March 2021 to enable cancer services to recover from the impact of Covid-19 (NHS England, 2021).

Patients living with undiagnosed lung cancers experienced disproportionate impacts due to factors including the similarity of presenting

symptoms with those of covid-19, and patients missed out on timely diagnosis (UKLCC, 2020; Greenwood and Swanton, 2021). Delayed presentation and reduced access to treatments led to increased mortality from lung cancer (UKLCC, 2020; Evison et al., 2021). Initiatives to address this included restoring targeted lung health checks, and a public health campaign to raise awareness of symptoms and prompt help seeking (UKLCC, 2020; Evison et al., 2021; NHS England, 2021).

A growing body of literature captures the impact of the pandemic on nurses working across a range of specialities. Nurses have been at the forefront of healthcare: caring for patients, organising or adapting to new workplace practices (Evans, 2021). This required rapid adoption of new ways of working to protect patients within the care settings, and new virtual ways of working/innovations (Mayor, 2020; Paterson et al., 2020; Evans, 2021). Nurses were adaptable, undertaking multiple roles to support patients and families (Baldwin and George, 2021). Negative mental health effects arose from fears about Covid-19 (Muller et al., 2020; De Kock et al., 2021), workplace stress (Paterson et al., 2020), and witnessing negative impacts on patients (Paterson et al., 2020; Cruickshank, 2021; Evans, 2021). Nurses experienced moral distress due to difficult clinical and ethical decisions (Rosa and Rushton, 2020).

Lung cancer and mesothelioma nurses' experiences of the pandemic were explored in two surveys in 2020. The first, undertaken by Lung Cancer Nursing UK (LCNUK, 2020) reported staff redeployments and absences due to Covid-19 resulting in stress, increased workloads, and concerns about maintaining service safety and/or performance. Most consultations were undertaken virtually, and fears were raised about negative patient impacts. Fewer new patients were seen than before the pandemic, and higher proportions via emergency routes. The second (Taylor et al., 2021) surveyed 20 Mesothelioma UK Clinical Nurse Specialists (CNSs). Key issues were the negative impact on patients'

prognosis and barriers in monitoring disease progression. Whilst virtual appointments were perceived as beneficial, some CNSs found the lack of face-to-face contact challenging and upsetting. CNSs witnessed the emotional impact of the pandemic on patients' wellbeing, but the impact on nurses' wellbeing was not explored.

In 2021 LCNUK, in collaboration with the Mesothelioma UK Research Centre (MURC) and the charity Mesothelioma UK (MUK) undertook a new survey to follow-up on their earlier studies.

The aim of the study was to explore the impact of covid-19 on lung Cancer and mesothelioma specialist nurses since January 2021.

2. Methods

A survey was devised in collaboration with a project team with academic and nursing representatives from MURC, LCNUK, and MUK. It consisted of 28 quantitative and 11 open qualitative questions with attention focussed on exploring issues not investigated by the earlier surveys. Three domains explored the impact of Covid-19 on: (1) ways of working and workload, (2) quality of care, and (3) health and wellbeing (box 1). These domains were selected on the basis of published evidence to explore both issues highlighted by the earlier LCNUK and mesothelioma (Taylor et al., 2021) surveys and key issues known to the project team to be impacting on nurses and not covered by the previous surveys, such as, health and wellbeing. This ensured that the content of the survey was meaningful and thorough. The project team are leading experts in the field and utilised this expertise and past experience of developing covid surveys to ensure that the survey was valid. This was in addition to the feedback from two CNSs who piloted the survey and minor changes were made based on their feedback.

"A validated tool was included: the measure of moral distress

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Box 1
Survey Question Domains

Respondent characteristics.

· Age-band
· Gender
· Ethnic group
· UK geographical location
· Length of time in the role

Ways of working and workload.

· Care delivery
· Virtual working

Quality of care.

· Care in comparison to before the pandemic
· Care left undone
· Disruption to services
· Impact on patients
· Support and supervision of work

Health and wellbeing.

· Worry about exposing family to Covid-19
· Emotional wellbeing and mental health
· Physical health and fitness
· Lifestyle
· Moral distress Survey
· Considering or leaving a clinical position due to moral distress

amongst health professionals (MMD-HP, Epstein et al., 2019) this was chosen because of appropriateness and comprehensiveness. For the purposes of this study moral distress is defined as professionals being unable to conduct what they believe to be ethically appropriate actions because of constraints or barriers, with little power to change it (Epstein et al., 2019).

The survey asked about care left undone or missed patient care. This was defined as "… any aspect of patient care that is omitted (either in part or completely) or significantly delayed" (Kalisch and Williams 2009, p291).

The online survey was developed using GoogleForms. It was launched on 27/09/21 and closed on 3/12/21. The inclusion criteria required respondents to be aged 18 years and above and working in the UK in an advanced or specialist nursing role in lung cancer or mesothelioma. LCNUK and MUK e-mailed the survey link and accompanying information sheet to nurses who were either members of LCNUK or funded by MUK. The survey was publicised via social media with the aim of broadening participation. A target sample size of 70 respondents was set, based on pragmatic consideration of previous survey responses and number of nurses in relevant roles. Email and social media remainders prompted participation.

2.1. Ethical considerations

Ethical approval was gained from a University Research Ethics Committee. Informed consent was presumed if someone completed the survey, with respondents asked to read the information sheet prior to participation.

Participants were directed to support services at the end of the survey if completing the questions caused distress.

2.2. Analysis

The data were checked to ensure that the inclusion criteria were met, and one record was deleted.

The quantitative data was analysed using descriptive statistics. Moral distress scores were calculated, and inferential statistics (Mann-Whitney and Kruskal-Wallis) used to explore differences in levels of reported moral distress within respondents, e.g., comparing levels of moral distress in nurses reporting that they had to leave care left undone, with nurses who did not. This analysis was undertaken to explore different experiences which might impact on moral distress. SPSS software and excel were used to undertake the analysis.

Open questions were analysed using the six-step approach to qualitative thematic analysis outlined by Braun and Clarke (2006). Initial coding was undertaken by SH and checked by CG and AG, and theme development was undertaken collaboratively. The final themes were discussed with the wider project team. Nvivo software was used to manage qualitative data analysis.

The "Strengthening the Reporting of Observational Studies in Epidemiology" (STROBE) checklist was used as the reporting guideline.

3. Findings

There were 85 responses to the survey and participant demographics are presented in Table 1. Most respondents were female (n = 80, 94%), white/white British (n = 82, 96%), working in England (n = 78, 92%), in roles held for between one and ten years (n = 50, 59%). A range of job roles were represented, most commonly CNSs (n = 74, 87%).

3.1. Ways of working

1.a) Changes in ways of working and work roles

The survey explored changes in ways of working since January 2021 (Fig. 1). 63 (74%) of respondents reported changes, and of these 44

Table 1
Respondent characteristics (n = 85).

| Category	Group	Number Percentage	
Gender	Female	n = 80	94%
	Male	n = 4	5%
	Non-binary	n = 1	1%
Age	20–29 years	n = 1	1%
	30–39 years	n = 16	19%
	40–49 years	n = 28	33%
	50–59 years	n = 33	39%
	60+ years	n = 7	8%
Ethnic group	White/White British	n = 82	97%
	Asian/Asian British	n = 2	2%
	Mixed/Multiple ethnic groups	n = 1	1%
Job role	Lung Cancer CNS	n = 47	55%
	Lung Cancer and Mesothelioma CNS	n = 18	21%
	Mesothelioma CNS	n = 8	9%
	Nurse in an advanced practice role (lung cancer or mesothelioma)	n = 8	9%
	Nurse Consultant	n = 2	2%
	Lung Cancer Matron	n = 1	1%
	Respiratory/Lung Cancer CNS	n = 1	1%
Work location	**England**		
	London	n = 6	7%
	South East	n = 10	12%
	South West	n = 7	8%
	West Midlands	n = 5	6%
	East Midlands	n = 11	13%
	East	n = 7	8%
	North West	n = 16	19%
	North East	n = 12	14%
	Yorkshire	n = 4	5%
	Northern Ireland	n = 0	0%
	Scotland	n = 5	6%
	Wales	n = 2	2%
Length of time in the role	less than one year	n = 6	7%
	1–5 years	n = 25	29%
	6–10 years	n = 25	29%
	11–15 years	n = 11	13%
	16–20 years	n = 9	11%
	more than 20 years	n = 9	11%
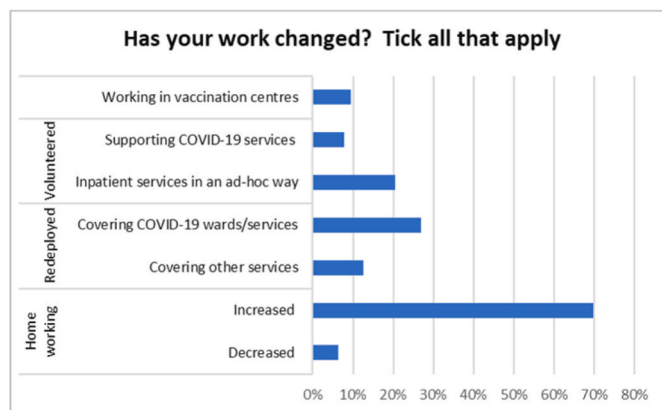
Fig. 1. Since January 2021, has your work changed in the following ways?.

(70%) reporting an increase in working from home; 25 (40%) being redeployed to cover COVID-19 wards or services, or other services; and 18 (29%) volunteering to work in inpatient services in an ad-hoc way or supporting COVID-19 services.

The qualitative data highlighted the impacts of stretched services. Nurses reported working longer hours to compensate for staff absences with negative impacts for patients due to thin and disjointed services, and also for nurses due to workload and the knowledge that quality of care was impacted:

> "Because my colleagues were redeployed and so I was lone working equivalent of 3 full-time posts … by being the only CNS I could not give the time I wanted for each patient. I could not be in 3 clinics at the same time" (respondent 4)

1.b.) **Virtual working**

The move to virtual working was a significant change, with 83 (98%) of respondents reporting new ways of virtual working not used prior to the pandemic (Table 3). Respondents indicated whether they perceived a positive or negative impact on quality of care in comparison to face-to-face provision and/or prior to the pandemic. The work activities with the highest percentage of positive impacts reported were Telephone or Video Health Needs Assessment (60%), and Video consultation (54%). Activities with the highest percentage of negative impacts were virtual support groups for families (43%), and telephone clinics (40%). Overall there was a higher percentage of positive responses to virtual working practices (60%) as opposed to negative (39%).

1.c.) **Impact of virtual working**

The shift to virtual clinical practice required a rapid adoption. The qualitative data highlighted concerns with some nurses reporting that patients lacked internet access, and were reliant on telephone communication. Whilst respondents perceived that there were benefits in terms of convenience and in some cases patient preference, a strong concern was expressed about deficits arising from the loss of face-to-face interactions.

Face-to-face communication was perceived as "superior" in terms of the quality of interactions enabling the building of rapport/relationships, conversational flow and discussion, and insights from visual cues. Virtual patient assessment was perceived as particularly challenging, with concerns about the quality of assessment. Respondents highlighted barriers in assessing symptoms, and holistic needs:

> "… I feel the reduction in F2F contacts does impact the ability to build therapeutic relationships, pick up on non-verbal cues and has reduced access to support services" (respondent 15)

Respondents sought to compensate for the deficits by new practices such as increasing the number of calls to check on patient welfare, and taking more time and care to explore issues. The potential for increased workload was highlighted with reports of repeated conversations.

> ".. the most difficult [thing] has been not seeing patients face to face, it is more difficult to assess patients symptoms in some cases and also relatives not being able to be present during consultations therefore meaning extra workload as these seem to then require repeated conversations and more support on the telephone" (respondent 31)

In some circumstances virtual communication was considered inappropriate, such as, when breaking bad news or discussing a diagnosis. There was also a need to consider individual patient preference regarding virtual care.

Virtual working impacted upon job satisfaction. Nurses missed face-to-face interaction with patients and perceived that they had lost an important aspect of nursing in the provision of empathetic support.

> "… I have really missed seeing patients face to face as I don't think you can display empathy adequately over the phone as they cannot see your face and body language" (respondent 41)

1.d) **Innovation**

The pandemic provided an opportunity to review current practices and for nurse-led innovation to reduce negative impacts of COVID-19 on patients. There were examples of new nurse-led clinics, greater collaborative working, and new ways of working to increase efficiency and reduce patient burden. One example of this was the implementation of a new community nursing service for lung cancer and mesothelioma patients. The following quotation illustrates this innovative approach:

> "… the pandemic has been a double-edged sword … we have been forced to review the ways in which we work and this is always positive- we have re-introduced some services that we had not been offering … and these have been audited showing a positive effect for patients" (respondent 72)

3.2. Patient Care

2a) **Changing care needs**

A high proportion of respondents reported that their patients had received a delayed diagnosis (86%) and were subject to disruptions in primary care services (90%) (Table 2). Qualitative data gave insights into the impact on patient care, with patients attending at a later stage of disease progression, requiring more complex care, and with greater support needs for both patients and their families:

> "We have an increased number of complex, ill patients who are requiring an increased amount of support. Patients are being admitted in crisis as GPs are not seeing patients" (respondent 30)

2b) **Workload**

Respondents reported increased workload to meet the changing care needs. Examples included providing more emotional and psychological support (71, 85%), and supporting family carers (68, 81%) (Table 4). Qualitative data highlighted increased workloads due to staff absences and attending to unaddressed patient needs due to barriers in accessing

Table 2
Quality of care (1–5); and impact of Covid-19 on nurses' health and wellbeing (6–14).

Variable	Response Number (%)			Moral Distress P values (differences between responses)
	Yes	No		
1. Do you feel you have been able to provide the same quality of care to your patients since January 2021?	n = 28 (33%)	n = 57 (67%)		$P = .803$
2. Due to lack of time and resources as a result of the COVID-19 pandemic, have you had to leave "care undone"?	n = 35 (43%)	n = 47 (57%)		The Mann-Whitney *U* Test revealed significant differences in the moral distress scores between 'Yes' (md = 82, n = 30) and 'No' (md = 46, n = 41), U = 431, Z = −2.142, P = 032[a], r = .3
3. Have there been any positive changes to the quality of care provided by you or your clinical team as a result of the changes during the COVID-19 pandemic?	n = 53 (64%)	n = 30 (36%)		$P = .606$
4. Would you say that your patients have experienced delayed diagnosis	n = 73 (86%)	n = 12 (14%)		$P = .339$
5. Are you aware of disruption to primary care services for your patients?	n = 75 (90%)	n = 8 (10%)		$P = .121$
6. Have you been worried about exposing your family to COVID-19?	n = 70 (83%)	n = 14 (17%)		$P = .550$
7. Are you considering leaving a clinical position now due to moral distress	n = 14 (17%)	n = 69 (83%)		$P = .054$
[1] I considered leaving but did not leave [2] I left a position	***No***	***Yes [1]***	***Yes [2]***	
8. Have you ever left or considered leaving a clinical position due to moral distress?	n = 39 (48%)	n = 28 (34%)	n = 15 (18%)	*A Kruskal-Wallis test revealed a significant difference in moral distress between the 3 responses (no, n = 31, Yes [1], n = 25, Yes [2], n = 15), x² (2, n = 71) = 11.9, P = .003[a]. The Median*

Table 2 (*continued*)

Variable	Response Number (%)			Moral Distress P values (differences between responses)
	Yes	No		
				values: No = 23, Yes [1] = 70, Yes [2] = 42
	Improved	**Worse**	**Same**	
9. Do you feel your emotional wellbeing has changed since the COVID-19 pandemic began?	n = 4 (5%)	n = 56 (66%)	n = 25 (29%)	$P = .678$
10. Do you feel your physical health and fitness has changed since the COVID-19 pandemic began?	n = 17 (20%)	n = 28 (33%)	n = 40 (47%)	$P = .665$
During the pandemic, how has your lifestyle changed	Increased	Decreased	Unchanged	
11. Alcohol intake	n = 21 (25%)	n = 8 (9%)	n = 56 (66%)	$P = .847$
12. Smoking	n = 1 (1%)	n = 1 (1%)	n = 83 (98%)	
13. Healthy eating	n = 18 (21%)	n = 31 (37%)	n = 36 (42%)	$P = .118$
14. Exercise	n = 30 (35%)	n = 31 (37%)	n = 24 (28%)	$P = .619$

[a] Statistically significant differences.

primary care services. GP access issues led to increased phone calls, and patients attending clinics with health issues normally dealt with in primary care: .

> "Doing more 'GP' work with general advice on symptoms not always related to cancer because [my] patients either can't get through or don't have enough credit on their phones to wait in a queue" (respondent 29)

2c) **Quality of Care**

Respondents described the hard work required, and subsequent exhaustion, to keep services afloat. For some there was anxiety because they had not been able to provide the same level of care as prior to the pandemic. They described their work during the pandemic as "fire-fighting" as opposed to proactive care. However there was pride in keeping services going:

> "As lead I have fought throughout the pandemic to keep my service and team afloat (all have had periods of either self-isolation or household isolation) but we have kept our service plus that of the GP's … going …" (respondent 29)

Two-thirds of the sample (57, 67%) reported they had been unable to provide the same quality of care to patients as prior to the pandemic (Table 2). The impact on 'care left undone' was less pronounced, with 41% (n = 35) of the total sample reporting that they had omitted or delayed aspects of required patient care.

Table 3

Experiences of virtual working – ways of working used since January 2021 (not used before the pandemic). T ick all that apply.

Virtual Ways of Working	Negative	Positive	Since January 2021	Responses to the question number (n) Percentage of total sample (%)
Virtual Team meetings	n = 18 (23%)	n = 40 (52%)	n = 19 (25%)	n = 77 (91%)
Virtual Education	n = 15 (20%)	n = 39 (53%)	n = 20 (27%)	n = 74 (87%)
Telephone clinics	n = 29 (40%)	n = 28 (39%)	n = 15 (21%)	n = 72 (85%)
Telephone consultations	n = 26 (39%)	n = 26 (39%)	n = 15 (22%)	n = 67 (79%)
Virtual MDT meetings	n = 19 (31%)	n = 30 (48%)	n = 13 (21%)	n = 62 (73%)
Increased email communication with patients/carer	n = 13 (25%)	n = 21 (41%)	n = 17 (33%)	n = 51 (60%)
Telephone/Video HNA	n = 9 (19%)	n = 29 (60%)	n = 10 (21%)	n = 48 (56%)
Virtual Support Groups for patients	n = 18 (43%)	n = 13 (31%)	n = 11 (26%)	n = 42 (49%)
Video consultations	n = 9 (24%)	n = 20 (54%)	n = 8 (22%)	n = 37 (44%)
Video clinics	n = 6 (23%)	n = 13 (50%)	n = 7 (27%)	n = 26 (31%)
Giving more patients/ carers my mobile telephone number	n = 7 (32%)	n = 10 (45%)	n = 5 (23%)	n = 22 (26%)
Using a WhatsApp group to communicate with patients/carers support group	n = 4 (29%)	n = 4 (29%)	n = 6 (43%)	n = 14 (16%)
No experience of virtual working and the associated technology	n = 4 (50%)	n = 2 (25%)	n = 2 (25%)	n = 8 (9%)
Total	n = 177 (30%)	n = 275 (46%)	n = 148 (25%)	

3.3. Nurses' wellbeing

The survey explored the impact of the COVID-19 on nurses' health and wellbeing since March 2020 (Table 2). Two-thirds of the sample reported a deterioration in emotional wellbeing and mental health (56, 66%). Impact on physical health and fitness was less pronounced, with one-third of the sample reporting a deterioration (28, 33%).

Qualitative data highlighted increased levels of stress. The pressure of working long hours and being the face of services receiving high volumes of late-stage presenting patients with a poor prognosis was both physically and emotionally demanding:

"Very anxious and emotional about things around me, seem to manage at work but when at home feel mentally and physically drained and overwhelmed with supporting each other and the patients" (respondent 33)

Staff redeployed into front-line services faced pressures from working outside their usual scope of practice, worry for colleagues left behind, and some described a lasting emotional legacy:

"I was redeployed at the beginning of the pandemic and was offered no support with the things I experienced on a covid ward. It caused disruption in our team, as I was the only person redeployed and that also affected my mental health" (respondent 66)

For respondents that had not been redeployed there was stress from increased workload, and for some worry and uncertainty about the prospect of being redeployed themselves.

A high proportion of the sample reported worry about exposing family members to Covid-19 (70, 83%). Nurses expressed fears of contracting Covid-19 and exposing family, patients, and colleagues to risk:

"Feeling out of control more often. Waiting for the inevitable which is me or my family getting covid and not knowing if we will be ok" (respondent 8)

3.3.1. Moral distress

Moral distress scores in the sample ranged from 0 to 432 (the minimum and maximum achievable scores, with higher scores indicating greater moral distress), with a median of 42 (Table 2). Analysis was undertaken to explore associations between moral distress and all the appropriate survey variables. Nurses reporting care left undone had significantly higher moral distress scores (median = 82), compared to those that did not (median = 46) (p = .032). Respondents who had never considered leaving (or had left) a clinical position had significantly lower moral distress scores (median = 23) than nurses who had considered leaving, but did not leave (median = 70) (p = .001).

When asked if they were considering leaving now (at the time of filling out the survey) due to moral distress, most respondents reported that they were not (n = 69, 83%).

3.3.2. Coping mechanisms

Respondents reported a range of positive and negative coping strategies. In the qualitative responses some described comfort eating to cope with stress, whereas others sought to boost their mental health through exercise. The quantitative data reported changes in lifestyle during the pandemic (Table 2). Two-thirds of the sample reported no change in alcohol intake (n = 56, 66%), while a quarter reported increased intake (n = 21, 25%). Impacts on healthy eating and exercise were more variable, with over one-third of the sample reporting decreased levels (n = 31, 37%). One-fifth of the sample reported an increase in healthy eating (n = 18, 21%), and approximately one-third

Table 4

Impact on workload and care delivery. Compared to before the pandemic, workload changes since January 2021.

Care Activity	Doing more Number (n) Percentage of sample undertaking this role (%)	Doing Less Number (n) Percentage of sample undertaking this role (%)	Stayed the same Number (n) Percentage of sample undertaking this role (%)	Not my role Number (n)
Cross cover (other tumours/ teams)	n = 16 (36%)	n = 5 (11%)	n = 23 (52%)	n = 41
Helping patients access treatments and trials	n = 42 (51%)	n = 4 (5%)	n = 37 (45%)	n = 2
Palliative care	n = 51 (61%)	n = 2 (2%)	n = 30 (36%)	n = 2
Symptom management	n = 57 (68%)		n = 27 (32%)	n = 1
Navigating appointments/ investigations	n = 61 (74%)	n = 3 (4%)	n = 18 (22%)	n = 3
Advocating for patients	n = 64 (76%)	n = 1 (1%)	n = 19 (23%)	n = 1
Supporting family/carers	n = 68 (81%)	n = 1 (1%)	n = 15 (18%)	n = 1
Emotional & psychological support	n = 71 (85%)		n = 13 (15%)	n = 1

reported increased levels of exercise (n = 30, 35%).

Opportunities for respite and coping mechanisms were limited. Some respondents reported not attending the gym due to work pressures, protecting patients, or feeling too exhausted. Others lacked the motivation to socialise, or were unable to because of COVID-19 guidelines:

"My usual coping mechanisms were completely removed. I enjoy meeting friends and family, visiting new places and having time away from home. I felt trapped and my mental health deteriorated" (respondent 75)

However working from home created more opportunities for some nurses to build activity into their routine:

"… more routine - less travel and working from home and so have been able to build exercise into my day …" (respondent 39)

Team support was a key coping mechanism with some respondents reporting that this had been instrumental in getting them through the pandemic, with technology used to connect and share experiences:

" The support for each other in chat (WhatsApp) and other virtual facilities and the understanding of what colleagues have been experiencing has been so important. Helping to address and support each others fears and experiences" (respondent 6)

However this method did not work for all, and some nurses felt unsupported with impacts on retention of staff.

"We have started a WhatsApp group and a weekly Teams meeting but day to day support and small positive interactions has reduced- one of our junior team members has left at least in part due to this problem" (respondent 72)

4. Discussion

The survey provided insights into the experiences of lung cancer and mesothelioma nurses during the second wave of Covid-19, and of the legacy of working through the pandemic. This is the first paper to explore experiences of this stage of the pandemic from this nursing perspective. Nurses are at the centre of building a resilient workforce required to restore services and deal with the backlog of undiagnosed cancer. The themes of the survey around virtual working, innovation, patient care, and nurse wellbeing are key to improving patient care and supporting the workforce (World Health Organization, 2020a).

The move to virtual working has been a key change in practice resulting from Covid-19 (NHS England, 2020). Whilst its use may not continue to the same extent in the future, virtual practices are now embedded as part of standard healthcare. In common with other studies the survey identified benefits for patients and nurses, with the greater flexibility and convenience of accessing care and providing services from home (LCNUK, 2020; Dalby et al., 2021). However, there were concerns which provide important learning points around when virtual consultations are appropriate for patients. Respondents perceived face-to-face interactions to be more productive for patient assessments exploring holistic needs. In common with other studies the survey identified occasions when virtual consultations are not appropriate, such as, when breaking bad news (Taylor et al., 2019; Round et al., 2021), or where patients prefer face-to-face interactions (LCNUK, 2020; Watson et al., 2021). This echoes the LCNUK survey (2020) finding that breaking bad news via telephone/virtually is emotionally difficult for patients and nurses. Further to this, Taylor et al.'s study (2021) highlighted occasions when patients prefer face-to-face interactions, such as, conversations about disease progression, and end of life.

Nurses in this study did not wish to lose a fundamental part of their nursing practice in building therapeutic relationships in face-to-face interactions. This resonates with concerns raised about the impact of Covid-19 on compassionate nursing, with nurses distanced from patients (Brown, 2020) facing cancer and covid-19 (Cruickshank, 2021).

However the survey showed how nurses adapted their virtual care practices to step-up compassionate support through the provision of additional calls to patients, and by taking time to explore issues. This is evidence that nurses were adapting practices either instinctively or to follow recommendations, such as, the call to increase check-in calls by Taylor et al. (2021).

The need to acknowledge the limitations of technology is key to a balanced approach to future hybrid working (Reeves et al., 2021). This is appropriate for addressing the needs of lung cancer and mesothelioma patients who are most frequently diagnosed in old age (Cancer Research UK, 2022). Respondents reported that patients were often limited to telephone communication, and thus do not benefit from video communications allowing nurses to observe patients, and for families to participate (Rygg et al., 2021). It is important to ensure that patients without internet access are not disadvantaged (Centre for Ageing Better, 2021).

This study adds evidence in understanding the impact of covid-19 on nursing during the second wave. Care became focussed around providing support for patients with complex needs and their families. Nurses took on new roles to cover redeployment and staff absences and were at the forefront of innovations to reduce negative impacts on patient care, such as, new nurse-led clinics. This versatility is seen in other studies (Baldwin and George, 2021). Increased workload was a key theme of the survey with nurses perceiving workload to be excessive. Respondents reported not being able to provide the same quality of care as prior to the pandemic, and of leaving care left undone. This combination of reduced staffing levels, and changes in the patient population in terms of greater numbers and complexity of care needs are factors in reported poorer patient care seen in other studies (e.g. Nymark et al., 2022). Care left undone may be an indicator of inadequate staffing levels (Griffiths et al., 2018) and of an under-resourced NHS stretched to the limits by the pandemic (House of Commons Health and Social Care Committee, 2021). Nurses were on the frontline of care and bore the brunt of this pressure. It is imperative that strategies are put in place to reduce pressures and improve the safety of both patients and nurses (Crusz et al., 2021), especially as this issue of concern was highlighted both earlier (LCNUK, 2020) and prior to the pandemic (Leary et al., 2014).

Respondents within our sample experienced some moral distress with a median score of 42. Whilst comparative data is limited, a preprint of a study exploring moral distress within intensive care units found nurses had a median score of 117 (Boulton et al., 2021). This is considerably higher than the score from this study, perhaps reflecting both a different context and the enabling influence of an experienced workforce and different working practices.

Within our sample moral distress was higher in respondents reporting care left undone and in people considering leaving a clinical position (but not doing so). This finding echoes Colville et al.'s (2019) (2019) assertion of the importance of considering the moral impact of work issues when looking at staff wellbeing. Care undone is a determinant of job satisfaction which has implications for retention of staff (Senek et al., 2020). Most respondents within our study reported that they were not considering leaving their posts due to moral distress (83%). Although not a direct comparison, the Royal College of Nursing Employment survey (2021) found that only 30% of respondents were not considering leaving their jobs. This is telling and speaks of a mesothelioma and lung cancer nurse workforce loyal to patients and colleagues during a global emergency. However, this cannot be relied on in the long-term and has implications for job retention.

Covid-19 had a substantial impact on nurses' wellbeing within our sample as they described living with the legacy of nursing through the pandemic, on-going pressures, and the exhaustion of caring for large numbers of very ill patients. In common with other studies, the survey found a deterioration in emotional wellbeing and mental health, combined with a fear of transmitting Covid-19 to family and colleagues (Paterson et al., 2020; De Kock et al., 2021; Nicola J. Roberts et al.,

2021). This finding underlines the importance of strategies to support a nursing workforce living with occupational stress. There is a limited evidence base on interventions to support healthcare workers' resilience and mental health during a pandemic (Pollock et al., 2020). What evidence there is suggests that strategies consider organisational, social, personal, and psychological factors. This study gave insights into beneficial sources of support, such as a supportive team who actively communicate, share and reflect on experiences. Our study found that the building blocks of resilience from both work and home settings, with accounts of nurses actively pursuing health through lifestyle options. Hybrid working enabled nurses to build exercise into routines, and this may partly explain the smaller negative impact on physical health in comparison to mental wellbeing.

Nurses in our study reported experiencing distressing levels of stress and anxiety but there was little evidence of organisational input to address this. Evidence suggests organisational strategies can reduce stress/anxiety and include signposting to sources of support (N. J. Roberts et al., 2021), or interventions promoting mindful self-care (Garcia et al., 2022). The psychological impact of the pandemic will require both short and long-term support (Maben and Bridges, 2020). There are barriers to accessing support arising from the nursing ethos of prioritising patient care above nurses' own needs (Baldwin and George, 2021), and support needs may go unvoiced. This would suggest a need for initiative-taking mental health support from organisations, to recognise and normalise the need for support. This need for a programme of support to recover and build resilience is recognised by the literature (e.g. Jackson, 2022).

4.1. Limitations

The survey used a convenience sample and therefore is not necessarily representative of UK wide nurses. Whilst the survey was open to UK nurses we did not receive any respondents from Northern Ireland and future studies should explore ways to broaden participation. The small sample size limited the statistical analysis and made it difficult to undertake sub-comparisons.

Due to the compressed timescale, enforced by the urgency of covid, we were unable to fully assess reliability and validity.

4.2. Recommendations

This study has provided recommendations to support nurses and patients in the next phase of the pandemic (Box 2). The recommendations have broader relevance to nurses working with other cancer specialities and patients. Further research is needed to monitor nurses' wellbeing overtime and to explore factors which foster resilience and how best to support nurses dealing with ongoing challenges.

5. Conclusion

Nurses are at the forefront of cancer care and it is important that they receive recognition for their tremendous work in caring for patients

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Box 2
Recommendations

Strategies for the integration of virtual working into patient care should learn from and take account of patient preference and of nurses' experiences:

● **Face-to-face interactions are crucial to building therapeutic relationships and job satisfaction and should be a key element of patient care**
● **Certain interactions/activities should ideally be undertaken face-to-face due to their sensitivity, such as conversations to break bad news; or where it is more productive, such as patient assessments.**
  ○ Virtual working should be undertaken with insight into the limitations of available technology and the digital divide
● **Virtual patient care should take account of the needs of patients and carers.**
  ○ Where possible and appropriate patient preferences should guide chosen modes of communication
  ○ Nurses should adopt practices to address the greater support needs of patients and their families, such as, the provision of additional support calls to check-in on wellbeing (Taylor et al., 2021)

Lung Cancer services are under increasing pressure due to the legacy of the pandemic and the shift in working practices within primary care. Strategies should take account of positive and negative impacts of changes.

● A strategic overview of lung cancer patient pathways and review of new working practices is required to ensure that health organisations are working effectively for patient benefit
● Nurses have demonstrated leadership and the ability to innovate to deal with the challenges of the pandemic and this should be recognised and fostered.

Nurses are living with negative mental health impacts arising from the pandemic and occupational stress and organisational and peer support **is essential to** support **and build resilience. This can be** supported **through initiatives that reflect local circumstances and needs,** such as:

● Proactive peer-to-peer support through checking-in on colleagues, open communication, and sharing and reflection of experiences
● Use of hybrid working to enable staff to build in exercise into the working week
● Proactive organisational support that is compassionate and recognises/normalises the emotional impact on staff

Organisations should review staffing levels to ensure both patient and staff safety and avoid adverse impacts.

● Nurses who are concerned about excessive workloads should use appropriate channels to raise concerns, and nurses should be made aware of what these appropriate channels are (Royal College of Nursing 2022).
● Where possible staff should not be redeployed to prevent further negative impacts for both patients and staff.

during the pandemic. Nurses have stepped up to the challenges with teamwork and innovation, and in common with other research we found evidence of camaraderie and pride in caring for patients against the odds (Baldwin and George, 2021). However there have also been costs of this in terms of negative impacts on mental health and wellbeing. The authors have provided recommendations to improve patient care and support the wellbeing of nurses, which will be key to a resilient workforce living with covid-19. Whilst this study focussed on lung cancer and mesothelioma specialists, the findings have wider implications for other cancer specialties.

Funding sources

Author contribution table

SH: Conceptualization, Methodology, Funding acquisition, CG: Data curation, Project administration, AT: Data curation, Project administration, SE-M: Formal analysis, Data curation, Writing – original draft, Visualization, Supervision, Funding acquisition, JF: Formal analysis, Writing – original draft, Visualization, Supervision, Project administration, KC: Formal analysis, Data curation, Writing – original draft, Visualization, Supervision, Project administration, LD: Formal analysis, Data curation, Writing – original draft, Visualization, Supervision, Project administration, LC: Formal analysis, Data curation, Writing – original draft, Visualization, Supervision, Project administration.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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