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Highlights

- This is the first global report of wellbeing in oncology professionals since the COVID-19 pandemic
- In this survey of 1520 oncology professionals, 67% reported a change in professional duties since COVID-19
- 25% had risk of distress (poor wellbeing), 35% felt burnout, and 66% not able to perform their job compared to pre-COVID-19
- Wellbeing and job performance since COVID-19 (JP-CV) were correlated with country of practice COVID-19 crude mortality rate
- The main predictors of wellbeing, burnout and JP-CV were resilience and changes to work hours
- JP-CV has improved but risk of distress and burnout has increased over time

ABSTRACT

Background

The impact of the COVID-19 pandemic on wellbeing has the potential for serious negative consequences on work, home life and patient care. The ESMO Resilience Task Force collaboration set out to investigate wellbeing in oncology over time since COVID-19.

Methods

Two online anonymous surveys were conducted (Survey I: April/May 2020; Survey II: July/August 2020). Statistical analyses were carried out to examine group differences, associations and predictors of key outcomes: (1) wellbeing/distress (expanded Wellbeing Index (eWBI – 9 items)); (2) burnout (1 item from eWBI); (3) job performance since COVID-19 (JP-CV – 2 items).

Results

Responses from survey I (1520 participants from 101 countries) indicate that COVID-19 is impacting oncology professionals with 25% of participants indicated being at risk of distress (poor wellbeing, eWBI ≥4), 38% reported feeling burnout, and 66% were not able to perform their job compared to pre-COVID-19. Higher JP-CV was associated with better wellbeing and not feeling burnout ($p<0.01$). Differences were seen in wellbeing and JP-CV between countries ($p<0.001$) and were related to country COVID-19 crude mortality rate ($p<0.05$). Consistent predictors of wellbeing, burnout and JP-CV were psychological resilience and changes to work hours. In survey II, among 272 participants who completed both surveys, whilst JP-CV improved (34% vs 51%, $p<0.001$), eWBI scores ≥4 and burnout rates were significantly higher compared to survey I (22% vs 31%, $p=0.01$; and 35% vs 49%, $p=0.001$

respectively) suggesting wellbeing and burnout have worsened over a three-month period during the COVID-19 pandemic.

Conclusion

In the first and largest global survey series, COVID-19 is impacting wellbeing and job performance of oncology professionals. JP-CV has improved but risk of distress and burnout has increased over time. Urgent measures to address wellbeing and improve resilience are essential.

KEYWORDS

Wellbeing

Burnout

Job performance

Oncology professionals

Resilience

COVID-19

INTRODUCTION

The wellbeing of oncology healthcare professionals is fundamental in ensuring that the best care is provided for cancer patients.(1) The component of physician wellbeing most comprehensively studied is burnout.(1) The prevalence of burnout in oncologists is already known to be significant,(1, 2) and with the current unprecedented impact of COVID-19 on healthcare systems globally, the wellbeing of oncologists is likely to be affected. However, the true long-term nature and extent of this is unknown.

In the early phase of COVID-19, oncology physicians in the United States and Singapore reported high levels of anxiety.(3, 4) In fact, the distress caused by COVID-19 is also experienced by physicians and surgeons across various specialties globally.(5-10) Increased burnout have been reported in frontline healthcare professionals surveyed globally through social media.(11) In the study from Wuhan, oncology physicians and nurses dispatched to work as frontline healthcare workers in a dedicated COVID-19 ward paradoxically had lower rates of burnout compared with colleagues who continued to work in their usual surroundings.(12) The authors hypothesised that direct involvement in combating COVID-19 may have provided frontline healthcare workers with a greater sense of control and hence reduced burnout.(12) These findings highlight the complexity and diversity of the impact of COVID-19 on wellbeing across different global regions and specialties.

The European Society for Medical Oncology (ESMO) established the ESMO Resilience Taskforce in December 2019 with a mandate to support wellbeing of oncology professionals after a high prevalence of burnout in young (≤40 years old) oncologists was previously identified.(2) Occupational factors integral to cancer care placing oncology professionals at

risk of burnout include delivering bad news, discussing and supervising complex treatment decisions with risk of toxicities and often without substantial prolongation of survival, pressures to keep at the forefront of scientific advances, and deliver research at a time where resources are challenged.(2) Substance abuse,(11) depression, suicide,(13, 14) medical errors,(12) professional misconduct,(15) and leaving oncology and early retirement(14, 16) have all been linked with burnout or poor wellbeing. These potential consequences could have a serious negative impact on patient care.(2)

In response to the COVID-19 pandemic, the ESMO Resilience Task Force launched a series of global surveys to evaluate the impact of challenges posed by COVID-19 on daily practice, wellbeing, current levels of support, and coping strategies of oncologists and other oncology professionals globally in order to develop support strategies. The longitudinal nature of these surveys is designed to identify relevant issues as the pandemic evolves as well as the longer-term impact on oncology professionals across countries.

Here, we report the findings of our first survey (Survey I) in this global series launched in April/May 2020, and also the initial results of a subgroup of participants who completed Survey II conducted in July/August 2020.

METHODS

Survey design

The ESMO Resilience Task Force, in collaboration with ESMO Young Oncologists Committee, ESMO Women for Oncology Committee, ESMO Leaders Generation Programme Alumni members, and the OncoAlert Network, designed a series of online global surveys

launched at different time-points during the course of the COVID-19 pandemic. The project was approved by the ESMO Executive Board. The surveys, hosted on the Qualtrics platform, were available on the ESMO website, ESMO membership emails, and were promoted through social media. Participation was voluntary and anonymous. Participants who consented to longitudinal evaluation of their responses at different time-points were assigned a trackable unique identifier code. Survey I was available online from 16 April to 3 May 2020, and Survey II was launched three months following Survey I (16 July to 5 August).

Survey measures

Sociodemographic, background variables, and three key outcomes of interest (wellbeing, burnout and job performance since COVID-19 (JP-CV)) were collected in the surveys (Table S1). In addition, psychological resilience, coping strategies, COVID-19-related job changes, perceptions of value and support, working environment, and changes to lifestyle were measured.

Resilience to changes at work was measured using a single item bipolar measure using a 9-point scale (low to high resilience).(17) Wellbeing was measured using the validated expanded Wellbeing Index (eWBI) screening tool consisting of 9 items.(15, 16, 18) Score of ≥4 has been shown to be associated with distress, fatigue, burnout and low quality of life in clinician populations.(15) A single item from eWBI,(16) 'have you felt burned out from your work?' ('yes' or 'no'), was used in this report as a surrogate question and preliminary screen of the current level of burnout amongst participants. JP-CV was measured by the mean score of two 5-point Likert scale (strongly disagree to strongly agree; scores 1 to 5) questions: 'compared to pre-COVID-19 outbreak, I am still able to do my job to the same standard' and

'I currently feel able to deliver the same standard of care to my patients as before the COVID-19 outbreak'. JP-CV score of ≥3.5 was considered favourable JP-CV.

Estimated crude mortality rate was calculated as a marker of the relative severity of COVID-19 outbreak in each country. This was calculated based on total number of COVID-19-related deaths per million population in each respective country using publicly available data provided by the World Health Organization (WHO)(19) and worldometer(20) (Figure 1).

Statistical analysis

Descriptive data were presented as median (interquartile range, IQR) or mean±standard deviation (SD), and proportions were expressed as a percentage. Chi-square analysis was used to compare categorical variables and paired or unpaired t-test were used to analyse continuous variables. p-values were two-tailed. Bivariate correlations were used to examine association between crude mortality rate and outcome measures. Linear regression analyses were used to assess predictors of wellbeing and JP-CV, and binary logistic regression analyses were used to identify factors associated with burnout. Hierarchical regression analyses were used to control for mortality rate where appropriate. Otherwise univariate regression was conducted followed by multiple regression to identify predictive factors on the outcomes of interest. All statistical analyses were performed using SPSS V.25.0/26.0 and data represented using GraphPad Prism V8.0.

RESULTS

Demographic and baseline characteristics of participants

A total of 1520 participants from 101 countries, of which 1020 (67%) were from Europe, completed survey I in April/May 2020 (Table 1 and Table S2). Overall, there were 777 (51%) female participants, 833 (55%) participants over the age of 40 years, and a majority (n=1070, 71%) were of white ethnicity. A total of 245 participants (16%) disclosed an increased personal risk due to underlying comorbidities or condition (Table S2). The most common primary place of work was general hospital (n=723, 48%) followed by cancer centre exclusively treating cancer patients (n=619, 41%). Almost all participants were clinicians, with medical oncologists most represented (n=1059, 70%). Trainees contributed to 22% (n=333) of responses, with majority having been in training for two or more years (n=262, 79%). More than half of non-trainees (n=688/1187, 58%) had more than 10 years of oncology experience. Majority of participants (n=1365, 90%) were ESMO members.

Changes in professional duties and job performance since COVID-19

More than two-thirds (n=1024, 67%) of participants reported a change in their professional duties since the COVID-19 outbreak (Table 2). Almost half of respondents (n=744, 49%) were performing remote consultations, and a third (n=499, 33%) reported more hours working from home. Of note, 14% (n=206) were involved in COVID-19 inpatient work and 16% (n=237) in COVID-19-related research. There were a significant number of participants who reported reduced clinical trial activity (n=573, 38%) and other research activity in general (n=443, 29%). Few (n=87, 6%) were fully redeployed during the COVID-19 pandemic.

In general, 49% (n=739) of participants reported that they were unable to do their job to the same standard compared to pre-COVID-19 and 53% (n=804) did not feel able to deliver the same standard of patient care (Figure 2C). Taken altogether, 66% (n=997) reported a mean JP-CV score of less than 3.5. Of note, 78% (n=1190) reported that their concerns for personal safety at work has increased due to COVID-19 (Figure S1). At the time of the survey, 19% (n=283) did not feel confident in being able to access COVID-19 testing if required, and 28% (n=418) did not have adequate access to personal protective equipment (PPE) at their workplace (Figure S1). Importantly, 62% (n=945) did have pleasant physical working conditions, 56% (n=857) had adequate control over most aspects of their job, and more than two-thirds (69%, n=1041) received adequate communication to do their job (Figure S1).

Wellbeing and burnout

On the whole, there were 386 participants (25%) with a self-reported cumulative eWBI score of ≥4 (Figure 2A). The proportion of participants at risk of distress, with eWBI score of ≥4, were significantly higher among female (29% vs 22%, p=0.0017) and young oncology professionals (aged ≤40 years) (33% vs 19%, p<0.001). A total of 572 participants (38%) specifically answered 'yes' to the burnout question, and this was also higher among female (42% vs 34%, p=0.001) and young oncology professionals (43% vs 32%, p<0.001).

Outcome measures were analysed to determine the associations between them using standard Pearson (r) and point biserial (r_{pb}) correlations. Higher job performance since COVID (JP-CV) was significantly associated with better wellbeing ($r(1519)$=-0·211, p<0.01) and not feeling burnout ($r_{pb}(1519)$=-0.148, p=0.01). Feeling burnout was significantly associated with poorer wellbeing ($r_{pb}(1519)$=0.672, p=0.01).

Wellbeing support and coping strategies

At the time of Survey I, wellbeing support services were accessible to 777 (51%) participants. Of these, 447 (58%) participants used a combination of approaches; most popular were online or smartphone apps, psychological support from work, and telephone support (Table S3). In addition, a variety of coping strategies were also used by participants including thinking of positives (n=740, 49%), a change in physical activity (n=726, 48%), talking to colleagues to get information (n=716, 47%), and using humour or laughing (n=623, 41%) (Table S3).

The majority of participants felt well-supported by their friends and/or family (n=1389, 91%), and colleagues (n=1254, 83%) (Table S3). More than half felt well-supported by the management at their workplace (n=864, 57%) and by global or national societies (n=864, 57%) (Table S3). Only 39% (n=585) reported feeling well-supported by their government. During this time, 75% (n=1142) felt valued by the public and 60% (n=908) felt valued by their work organisation.

Predictors of wellbeing, burnout and job performance since COVID-19

Correlational analyses were conducted on participants who stated their country of practice (n=1519) to explore if there was an association between the estimated COVID-19 crude mortality rate and key study measures in Survey I. There was a statistically significant relationship between crude mortality rate and wellbeing ($r(1519)=0.061$, $p<0.05$) and JP-CV ($r(1519)=-0.115$, $p<0.01$); as the crude mortality rate increases, there is poorer wellbeing and JP-CV. This was controlled for in the following regression analyses. Feeling burnout varied between countries but was not associated with COVID-19 crude mortality rate ($p>0.05$).

Regression analyses showed lower levels of distress was significantly ($p<0.05$) associated with age above 40 years, male gender, having pleasant working conditions, feeling valued by their organisation, a change in physical activity, having higher levels of psychological resilience, no increase in working hours, no reduction in their clinical trial activity, having no concern about the impact of COVID-19 on their training and career, no experience of self-isolation due to COVID-19 symptoms, not feeling worried about personal wellbeing, no changes in diet, not 'talking to colleagues for emotional support', and choosing not to 'avoid thinking about things' (Figure 3A).

Higher JP-CV scores were significantly ($p<0.05$) predicted by white ethnicity, by specialists in surgical oncology or haematology, having adequate job control, higher level of psychological resilience, having no reduction in their clinical trial activity, not working more hours from home, not worried COVID-19 will have a negative impact on cancer research in their institution, and not using 'distraction' as a coping strategy (Figure 3B).

Burnout was significantly ($p<0.05$) associated with having more out-of-hours work, increased number of working hours, concern about the impact of COVID-19 on training or career, feeling worried about wellbeing, and access to psychiatrist or psychologist, those from white ethnicity, those who reported working in unpleasant working conditions, feel unsupported by their government, and had lower levels of psychological resilience (Figure 3C).

Subgroup analysis of participants who completed both surveys I and II

In survey II (July/August 2020), there were 272 participants from survey I who agreed to longitudinal follow-up of their responses to both surveys. Compared to survey I, there was a

significant increase in the proportion of participants at risk of distress (eWBI score of ≥4) (31% vs 22%, p=0.0115) (Figure 4A) and self-reporting burnout (49% vs 35%, p=0.0013) (Figure 4B). The proportion of participants reporting favourable job performance since COVID-19 (JP-CV) (mean score ≥3.5) increased from 38% to 54% (p=0.0005) (Figure 4C).

DISCUSSION

The importance of wellbeing and burnout, and their impact on delivering healthcare has increasingly been recognised over the years. The COVID-19 pandemic poses additional, extreme challenges on healthcare systems worldwide and health care professionals have to maintain patient care whilst facing personal risks. However, reports on the immediate and long-term effects of such a crisis on healthcare professionals are limited. In a survey of Italian doctors (hospital, primary care and freelance) during the first lockdown period (March 2020), wellbeing (using WHO-5 Well-Being Index) was rated poor by 59%.(21) The authors noted the need for follow-up surveys to monitor wellbeing and distress.(21) The ESMO Resilience Task Force survey collaboration provides the largest and most comprehensive report on the current wellbeing of oncology professionals in response to the COVID-19 pandemic across the world.

Survey I revealed that oncologists working in different countries varied in terms of their perceived wellbeing and job performance since COVID-19 (JP-CV), and there appeared to be worse self-reported wellbeing and JP-CV in countries with a higher COVID-19 crude mortality rate. A similar finding was reported amongst Spanish healthcare workers, where there were higher distress levels in areas with the highest incidence of COVID-19.(22) Encapsulating the dynamic changes of COVID-19 globally for comparison is challenging particularly because of

discordant methodology for cases and deaths between countries. We felt the estimated COVID-19 crude mortality rate was a measure that could represent the situation most reproducibly and accurately at the time. However, most countries have experienced regional variation of mortality rate.

In this survey series, the expanded wellbeing index (eWBI) was selected to measure wellbeing. The self-reported eWBI, developed initially at Mayo Clinic,(15, 16, 18) measures six dimensions of distress and wellbeing. It is a validated screening tool used to measure wellbeing over time in large cohorts of US clinicians and non-clinicians.(15, 16, 18) To our knowledge, this is the first large survey to report on the utilisation of the eWBI in a global setting.

There are multiple methods of assessing burnout in literature.(1) The Maslach Burnout Inventory (MBI) is the most extensively used.(23) Whilst historically considered the gold standard, it is recognised that other instruments that are brief and have the ability to screen for multiple dimensions of distress, may be more practical for healthcare professionals to complete in busy working environments. In this survey series, we have used participant answers to the specific burnout question from the eWBI as a readout for prevalence of feeling burnout at a time point. Our intention was to establish how participants consider themselves feeling burnout which can be easily assessed over time. The rates of self-reported 'feeling burnout' described in this survey series, is in keeping with burnout rates reported in earlier studies that used different, validated methods to assess burnout in oncologists (34-70%).(2, 24-26)

We found consistently that, among others, working hours and participants' psychological resilience were significant factors associated to overall better wellbeing, level of burnout and JP-CV. Other notable findings were that the risk of distress and burnout appeared to be significantly higher in female compared to male colleagues. Similarly, wellbeing and burnout rates were worse among young oncology professionals (≤40 years). There were also other critical findings related to clinical practice noted. A large majority (78%) of participants were concerned for their personal safety at work. More than a quarter of participants did not have adequate access to personal protective equipment (PPE), and 19% did not feel confident in being able to access COVID-19 testing if required. Over two-thirds of oncology professionals noted a change in professional duties with more hours working from home and increased use of remote consultations being common reasons. These findings reflect the fact that COVID-19 has forced the rapid adoption and optimisation of telemedicine as an alternative mode maintaining the delivery of patient care whilst reducing footfall.(27)

Our survey series has shed light on various wellbeing support and coping strategies used by survey participants in response to the circumstantial changes imposed by COVID-19. However, only slightly more than half of the participants reported having access to wellbeing support services. This raises some concern about the equitable provision and/or awareness of support to the oncology profession. A supportive institutional programme was noted as a significant factor affecting both anxiety and depressive symptom levels during COVID-19 in a survey of researchers in the field of radiation oncology (28). In addition, the authors reported the feeling of a little or a lot of guilt being more abundant when self-perceived productivity declined.

Although the ESMO Resilience Taskforce first survey had over 1500 participants representing more than 100 countries globally, it has the inherent limitations by virtue of primarily being a membership survey with 90% of participants being ESMO members. It is not possible to establish the proportion of oncology professionals who participated in the survey globally. The number of participants varied across countries with the majority from Europe (highest participation from: United Kingdom (n=174), Italy (n=124), Spain (n=102), Germany (n=84) and India (n=82)). Most participants were doctors with 70% medical oncologists. Importantly, 22% of survey I participants were trainees which is in keeping with the current proportion of trainee doctors within the ESMO membership (23%). There were representative proportions for age (45% ≤40 years) and gender (51% male, 49% female). Important considerations for the survey design was balancing the time to complete the survey, complexity of questions in an international setting where English may not be the first language of participants, and key information of interest for oncology professionals and organisations. This meant that brief, concise, tools assessing key outcomes of interest were selected in order to minimise the burden of completing these surveys during these unprecedented COVID-19 times.

Our findings are based on self-reported experiences of oncology healthcare professionals who were aware of the surveys and decided to participate. Therefore, there is a potential for bias. Nevertheless, this survey provides a snapshot of the acute reaction of oncology professionals to COVID-19 across different countries. We believe that the observations made here will be dynamic as the pandemic evolves, and further strengthened by the ongoing longitudinal analyses, which will be reported and obtained in subsequent surveys.

The key strength of this survey series is the ability to analyse important outcomes of interest over time. In this report, we presented wellbeing at two time points three months apart and observed that in this longitudinal cohort of participants, poor wellbeing and feeling burnout has increased. However, job performance improved and may be a reflection of the increase in knowledge, education and experience managing cancer patients in the COVID-19 era. Although the improved self-perceived JP-CV noted is reassuring for patient care, this will be continually assessed as part of subsequent surveys, together with the long-term impact on wellbeing and burnout, in order to evaluate if job performance is maintained.

Supporting wellbeing and minimising the risk of burnout are priorities in order to ensure patient management pathways and cancer care are not additionally compromised as a result of COVID-19. The results of the ESMO Resilience Taskforce surveys will contribute to raising awareness and developing support solutions for individuals, hospital organisations and societies. Measures such as taking action on factors associated with more favourable outcomes in this survey including tackling issues in relation to working hours, addressing concerns with regards to the impact of COVID-19 on training or career and clinical trials, and improving staff resilience to change are essential.

Contributors

S.B., K.H.J.L., K.M., K.K., K.P., C.O., M.O.C., J.B.A.G.H., and C.H. conceived and designed the study. K.H.J.L., E.T., and C.H. analysed the data. All co-authors were involved in data interpretation. K.H.J.L, E.T., and C.H. produced the manuscript figures and tables. S.B., K.H.J.L., E.T., and C.H. wrote the first draft of the paper. All co-authors contributed to reviewing and editing drafts of the paper. S.B., K.H.J.L., and C.H. were involved in the final reviewing and editing of the paper and approving the manuscript.

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TABLE CAPTIONS

Table 1 Participant demographics (n=1520).

Table 2 Change in professional duties since the COVID-19 outbreak (n=1520).

FIGURE CAPTIONS

Figure 1 Estimated crude mortality rate due to COVID-19 in countries where participants are working in (n=1520 from 101 countries) during the survey period (16 April to 3 May 2020).

Figure 2 (A) Self-reported wellbeing, (B) resilience, and (C) job performance since COVID-19 (JP-CV) during the COVID-19 crisis (n=1520).

Figure 3 Hierarchical multiple regression and multiple logistic regression analyses of predictive variables associated with (A) self-reported wellbeing (n=1518) and (B) job performance since COVID-19 (JP-CV) (n=1494), and (C) burnout (n=1494), respectively. Note: [a]dichotomous variable (0= no, 1= yes; 0= ≤40 years, 1= >40 years; or 0 = white; 1 = non-white); [b]Likert scale (1= strongly disagree – 5= strongly agree); [c]Likert scale (1= not at all – 5= extremely); [d]bipolar scale (1 = reflects low resilience – 9 = reflects high resilience).

Figure 4 Paired longitudinal comparison between survey I (April/May 2020) and survey II (July/August 2020) of key measures: (A) self-reported wellbeing, (B) burnout,

and (C) job performance since COVID-19 (JP-CV), during the COVID-19 crisis among those who completed both surveys (n=272). (*p<0.05, **p<0.01, ***p<0.001).

SUPPLEMENTARY DATA

Table S1 Outcome measures of interest.

Table S2 Personal and lifestyle issues of relevance to the COVID-19 pandemic (n=1520).

Table S3 Wellbeing support and coping strategies amongst participants during the COVID-19 crisis (n=1520).

Figure S1 Working environment during the COVID-19 crisis (n=1520).

Table 1

		Number, n (%)
Age (years)	≤40	687 (45%)
	>40	833 (55%)
Gender	Female	777 (51%)
	Male	742 (49%)
	Non-binary	1 (0.1%)
Ethnicity	White	1070 (70%)
	Asian	277 (18%)
	Arab	52 (3%)
	Mixed	45 (3%)
	Black	20 (1%)
	Other	35 (2%)
	Prefer not to say	21 (1%)
Region of work	**Europe***	**1020 (67%)**
	Southwestern Europe	271 (18%)
	Central Europe	248 (16%)
	Northern Europe and British Isles	247 (16%)
	Western Europe	109 (7%)
	Southeastern Europe	103 (7%)
	Eastern Europe	42 (3%)
	Asia	**261 (17%)**
	North America	**79 (5%)**
	South America	**69 (5%)**
	Africa	**57 (4%)**
	Oceania	**33 (2%)**
	Prefer not to say	1 (0.1%)
Primary place of work	General hospital	723 (48%)
	Cancer centre	619 (41%)
	Private outpatient clinic	65 (4%)
	Pharmaceutical/technology company	36 (2%)
	Healthcare organisation	18 (1%)
	Other	59 (4%)
Specialty†	Medical oncology	1059 (70%)
	Clinical oncology	271 (18%)
	Haemato-oncology	123 (8%)
	Radiation oncology	88 (6%)
	Palliative care	86 (6%)
	Laboratory-based researcher/scientist	53 (4%)
	Surgical oncology	43 (3%)
	Nursing	18 (1%)
	Other	120 (8%)
Trainee	Yes	333 (22%)
	No	1187 (78%)
Duration of training completed (years), n=333	<2	71 (21%)
	2-5	185 (56%)
	>5	77 (23%)
Post-training oncology experience (years), n=1187	<5	249 (21%)
	5-10	240 (20%)
	>10	688 (58%)
	Not applicable	10 (1%)
ESMO member	Yes	1365 (90%)
	No	155 (10%)

*Southwestern Europe – Italy, Portugal, Spain; Central Europe – Austria, Czech Republic, Germany, Hungary, Poland, Romania, Slovakia, Slovenia, Switzerland; Northern Europe and the British Isles – Denmark, Finland, Norway, Republic of Ireland, Sweden, United Kingdom; Western Europe – Belgium, France, Luxembourg, The Netherlands; Southeastern Europe – Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Greece, Israel, Kosovo, Montenegro, North Macedonia, Serbia, Turkey; and Eastern Europe – Belarus, Estonia, Georgia, Latvia, Lithuania, Moldova, Russian Federation, Ukraine).

†Note that some participants have selected 2 or more specialties within their job role, and proportion of representation is summarised as such.

Table 2

		Number, n (%)
Change in professional duties	Yes	1024 (67%)
	No	496 (33%)
Nature of change in professional duties	**Scope of clinical work**	
	More remote (video/telephone) consultations	744 (49%)
	Increased direct patient care	103 (7%)
	Less inpatient work	388 (26%)
	More inpatient work	148 (10%)
	COVID-19 inpatient work	206 (14%)
	Cover other oncology non-COVID-19 patients	187 (12%)
	Cover non-oncology specialties	168 (11%)
	Working hours and shift patterns	
	More hours working from home	499 (33%)
	Reduced number of hours of work	373 (25%)
	Increased number of hours of work	254 (17%)
	More out of hours work in hospital	242 (16%)
	More weekend shifts	175 (12%)
	More overnight shifts	122 (8%)
	Clinical trial and research	
	Reduced clinical trial activity	573 (38%)
	Reduced research (non-clinical trials) activity	443 (29%)
	COVID-19 related research	237 (16%)
Redeployed	Yes	87 (6%)
	Partially	275 (18%)
	No	1158 (76%)
Redeployment relevant to prior training, n=362	Yes	154 (43%)
	No	208 (57%)
Adequate training for redeployment, n=208	Yes	114 (55%)
	No	94 (45%)

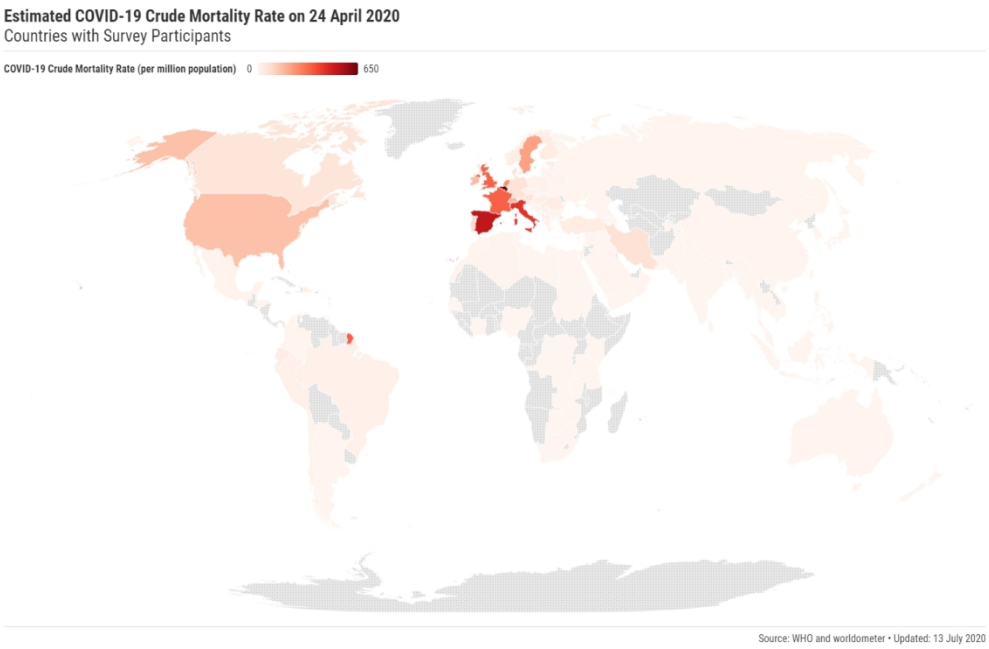


Figure 1 | Estimated crude mortality rate due to COVID-19 in countries where participants are working in (n=1520 from 101 countries) during the survey period (16 April to 3 May 2020).

535x364mm (300 x 300 DPI)

Figure 2

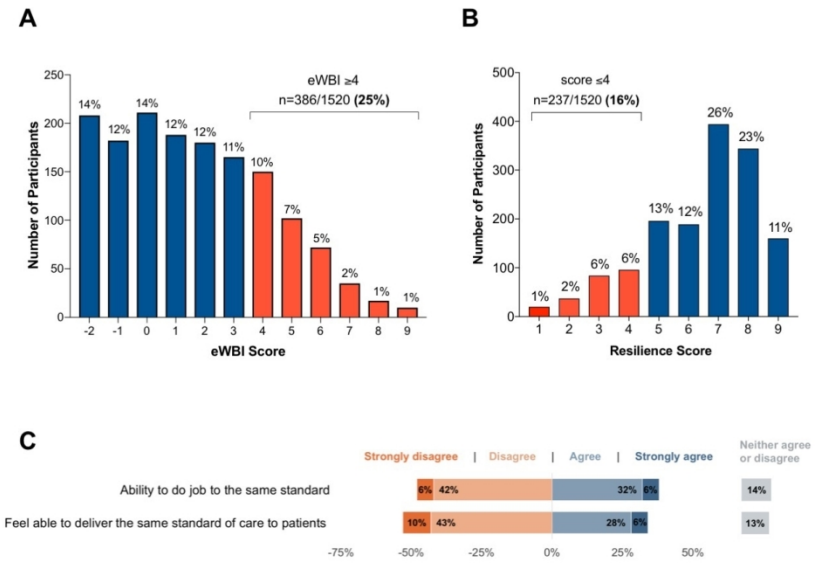
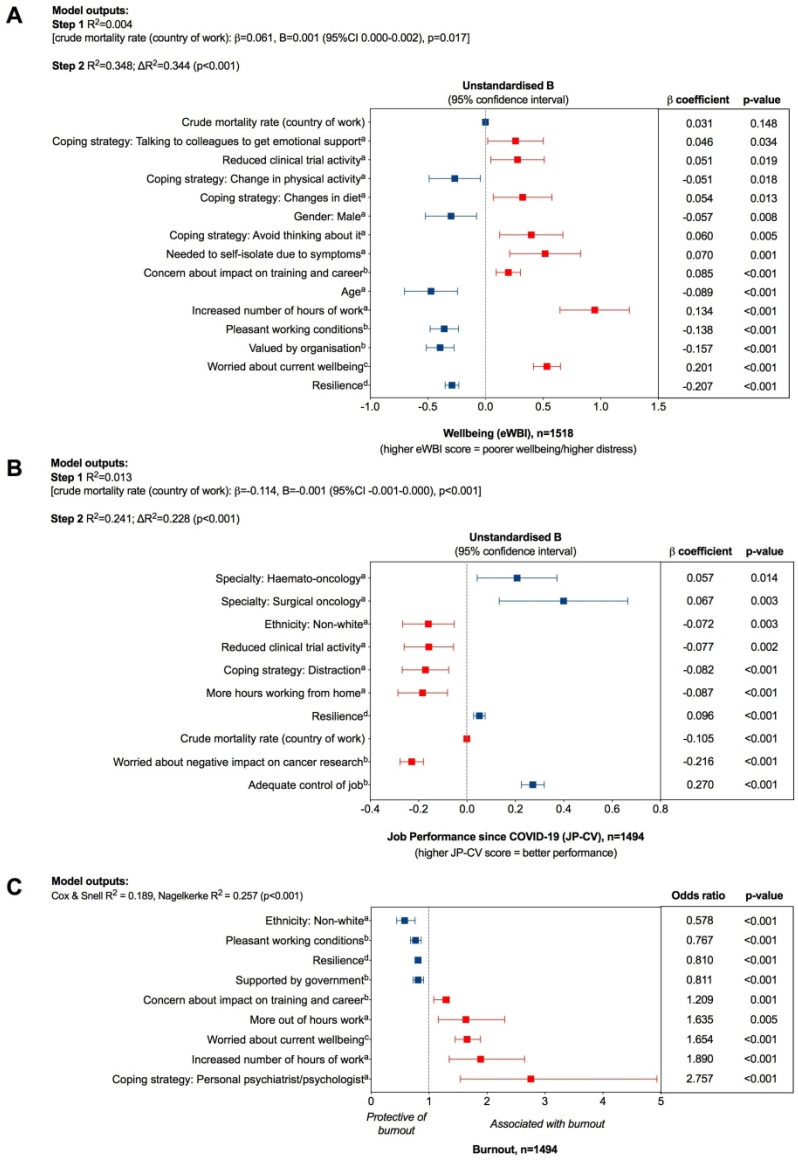


Figure 2 | (A) Self-reported wellbeing, (B) resilience, and (C) job performance since COVID-19 (JP-CV) during the COVID-19 crisis (n=1520).

107x154mm (300 x 300 DPI)

Figure 3



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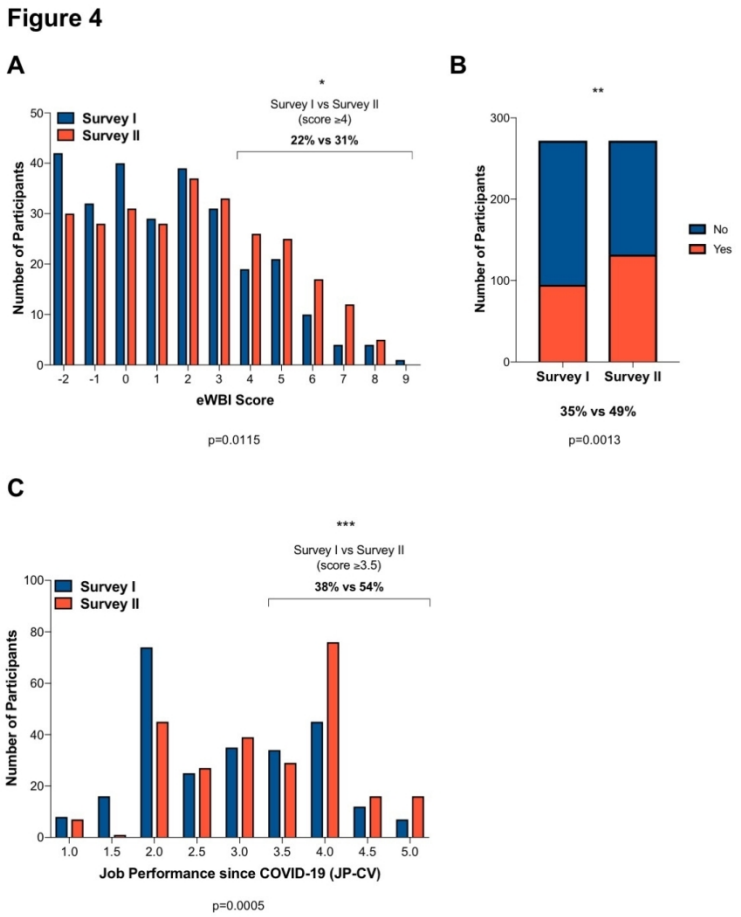

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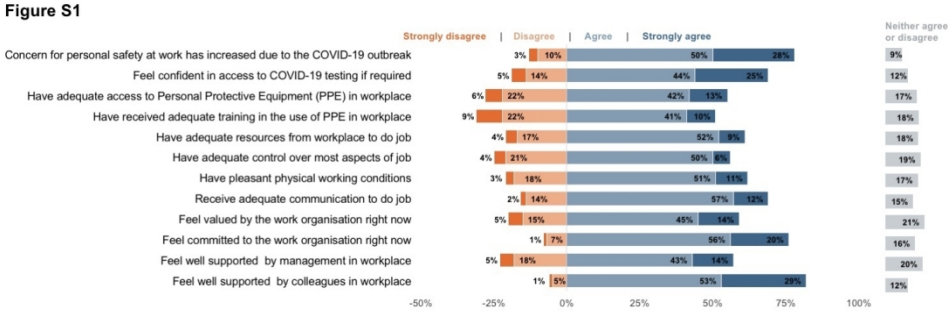
107x154mm (300 x 300 DPI)

Figure S1



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Supplementary Table S1
Outcome measures of interest.

	Items	Response options
Wellbeing (eWBI)*	Since the COVID-19 outbreak:	
	1. Have you felt burned out from your work?	Binary response; no [0], yes [1]
	2. Have you worried that your work is hardening you emotionally?	Binary response; no [0], yes [1]
	3. Have you often been bothered by feeling down, depressed or hopeless?	Binary response; no [0], yes [1]
	4. Have you fallen asleep while sitting inactive in a public space?	Binary response; no [0], yes [1]
	5. Have you felt that all things you had to do were piling up so high that you could not overcome them?	Binary response; no [0], yes [1]
	6. Have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)?	Binary response; no [0], yes [1]
	7. Has your physical health interfered with your ability to do your daily work at home and/or away from home?	Binary response; no [0], yes [1]
	"The work I do is meaningful to me"	7-point Likert scale; very strongly disagree [1] to very strongly agree [7]
	"My work schedule leaves me enough time for my personal/family life"	5-point Likert scale; strongly disagree [1] to strongly agree [5]
Job Performance since COVID-19 (JP-CV)† Mean score composite created of the two items	'Compared to pre-COVID-19 outbreak, I am still able to do my job to the same standard'	5-point Likert scale; strongly disagree [1] to strongly agree [5]
	'I currently feel able to deliver the same standard of care to my patients as before the COVID-19 outbreak'	5-point Likert scale; strongly disagree [1] to strongly agree [5]
Burnout	Have you felt burned out from your work?	Binary response; no [0], yes [1]

*Kuder-Richardson 20 for the WBI-7 was 0.766.
†Chronbach's Alpha for the JP-CV was 0.736.

Supplementary Table S2
Personal health and lifestyle issues of relevance to the COVID-19 pandemic (n=1520).

		Number, n (%)
Increased personal risk due to comorbidities or condition	Yes	245 (16%)
	No	1235 (81%)
	Prefer not to say	40 (3%)
Comorbidities or condition	Respiratory	78 (5%)
	Cardiac	77 (5%)
	Diabetes mellitus	30 (2%)
	Immunosuppressed	26 (2%)
	Renal, Hepatic or Neurological	11 (1%)
	Pregnant	9 (1%)
	Other	67 (4%)
Smoke cigarettes	Yes	78 (5%)
	No	1439 (95%)
	Prefer not to say	3 (0.2%)
Drinks alcohol	Yes	768 (51%)
	No	750 (49%)
	Prefer not to say	2 (0.1%)
Needed to self-isolate due to COVID-19 symptoms	Yes	
	<2 weeks	117 (8%)
	2-4 weeks	66 (4%)
	>4 weeks	41 (3%)
	No	1296 (85%)
Needed to self-isolate due to contact with known COVID-19 positive individuals	Yes	
	<2 weeks	121 (8%)
	2-4 weeks	66 (4%)
	>4 weeks	20 (1%)
	No	1313 (86%)
Tested for COVID-19	Yes	359 (24%)
	No	1161 (76%)

Supplementary Table S3

Wellbeing support and coping strategies used by participants during the COVID-19 crisis (n=1520).

		Number, n (%)
Access to wellbeing support services	Yes	777 (51%)
Wellbeing support services used	Online or smartphone apps	236 (16%)
	Psychological support from work	161 (11%)
	Telephone support	140 (9%)
	Spiritual or religious support	123 (8%)
	Personal psychiatrist/psychologist	60 (4%)
	Psychological support from national organisations	29 (2%)
	Charities supporting mental health	18 (1%)
	Other	48 (3%)
	None	330 (22%)
Feeling well-supported during COVID-19	By friends and/or family	1389 (91%)
	By colleagues at workplace	1254 (83%)
	By management of workplace	864 (57%)
	By global or national societies	864 (57%)
	By government	585 (39%)
Feeling valued	By the public	1142 (75%)
	By work organisation	908 (60%)
Coping strategies used	Thinking of positives	740 (49%)
	Change in physical activity (e.g. exercise)	726 (48%)
	Talking to colleagues to get information	716 (47%)
	Using humour, laughing	623 (41%)
	Distracting myself	505 (33%)
	Talking to colleagues to get emotional support	484 (32%)
	Strategising and planning steps to take	440 (29%)
	Changes in diet (e.g. types of food, amount)	409 (27%)
	Avoiding thinking about or not thinking about it	306 (20%)
	Using meditation, mindfulness or other relaxation techniques	282 (19%)
	Using religious or spiritual practice(s)	277 (18%)
	Changes in substance intake (e.g. smoking, alcohol, others)	165 (11%)
	Other	75 (5%)
	None	125 (8%)