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Faculty of Medicine

Clinical and Experimental Sciences

Exploring Intra-work Break Taking in Doctors Before and During the Covid-19 Pandemic

by

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Abstract

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Burnout in doctors is a longstanding, prevalent public health issue. The Covid-19 pandemic posed an additional threat to doctors' wellbeing, particularly for those who began careers at the pandemic onset. Intrawork rest breaks could be a helpful means of improving doctors' wellbeing. This project explored break taking in UK doctors before and during the pandemic.

Systematic review of literature on the effectiveness of breaks for doctors' wellbeing and/or job performance found a widespread lack of evidence, in quantity and quality, and identified a need for further exploratory research. A longitudinal mixed methods design sought to fill this evidence gap. Quantitative surveys preceded explanatory follow-up semi-structured interviews in two phases (pre-pandemic and post-pandemic outbreak).

In a pre-pandemic survey of doctors of all grades ($N=250$), repeated twice during the pandemic with newly-qualified foundation doctors (July/August 2020 $N=78$; November 2020 $N=58$), most participants perceived breaks as important to wellbeing but were unable to take breaks daily or weekly. Workload and staffing levels were most commonly cited barriers, and lack of break facilities the least cited barrier. Interventions most likely to facilitate breaks were those that reduced workload and/or granted permission. Interventions most often implemented by NHS trusts (e.g. facility improvements, reminders) were ranked least likely to make a difference.

In pre-pandemic follow-up interviews ($N=21$) participants described a range of structural, procedural, and individual factors that interact to affect break practices, and interventions that could attenuate these effects. Interviews with doctors of all training grades at the pandemic onset ($N=12$) and foundation year doctors one year later ($N=9$) explored factors affecting break practice and work experiences under pandemic conditions, and potential areas for intervention. Compared with pre-pandemic narratives, individuals described having more passive roles, which focused on coping with, rather than changing, the considerable disruption to structures and procedures under pandemic conditions. Integration of findings across studies and chronological phases resulted in a proposed conceptual model of break taking in doctors.

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Research Thesis: Declaration of Authorship

Print name: Aimee Nicole O'Neill

Title of thesis: Exploring Intra-work Break Taking in Doctors Before and During the Covid-19 pandemic

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. Parts of this work have been published as:-

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Signature: Date:

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Definitions and Abbreviations

Definitions

- Consultant Senior doctor that has completed full medical training in a specialty. Includes 'attending' physicians/surgeons (US terminology)
- Foundation programme Two-year work-based postgraduate training programme following completion of undergraduate medical training. It is paid employment and takes place within hospital trusts. Foundation year 1 (FY1) trainees have provisional registration with the GMC until foundation year 2 (FY2) when they receive full registration with a licence to practise. The foundation grade of doctor replaced the previous grades known as 'pre-registration house officer' (PRHO) and 'senior house officer' (SHO).
- Interim foundation doctor .. The name given to the 2019/2020 cohort of medical graduates who undertook an optional short-term placement in NHS trusts in the months between their accelerated graduation (April 2020) and the planned FY1 placement (August 2020).
- Junior doctor or trainee Qualified doctors who have completed a medical degree and are in clinical training (not yet consultants). Work under the supervision of a senior doctor and can have up to 8 years of experience as a doctor.
- Locum doctor Fully qualified doctor who temporarily covers a position (e.g. sick leave or temporary support for large workloads). Doctors of any grade (aside from foundation year 1 doctors) can work as locum doctors
- Medical student Students who undertake 5 years of undergraduate training to become a doctor
- SAS doctor Staff, associate specialist and specialty doctors. A diverse category of doctors in non-training roles – they are neither trainee nor consultant. Roles in this category range from doctors with 4 years of experience (like trainees) to senior doctors practising independently (like consultants). This includes specialist doctors (minimum 12 years medical work experience since qualification, at least 6 years in relevant specialty), specialty doctors (minimum 4 years postgraduate training, at least 2 years in relevant specialty), and associate specialists (minimum 10 years medical work experience since qualification, at least 4 years in relevant

Definitions and Abbreviations

specialty). The classification system has changed over the years and, since 2008, the 'specialty doctor' grade encompasses doctors previously known as trust grade, staff grade, clinical medical officer, hospital practitioner, and clinical assistant. The associate specialist role was also closed to new applications in 2008. New SAS doctors will be specialty or specialist doctors only.

Senior House Officer Grade of doctor in previous grading system. Replaced by foundation programme terminology. Sometimes used unofficially to refer to doctors in FY2 or ST1/CT1 roles who work similar rota shifts.

Specialty or Core trainee Following foundation programme training, doctors enter core and/or specialty registrar training, depending on whether the specialty offers 'uncoupled' or 'run through' specialty programmes. Uncoupled specialty training: 2-3 years of core training is completed (CT1, CT2, CT3) followed by a further application process to higher specialty training (ST3, ST4, ST5 etc.). Run through specialty training: There is no further application process and doctors enter the programme at specialty training year 1 (ST1).

Abbreviations

AAU – Acute assessment unit

AMU – Acute medical unit

COVID-19 – Coronavirus disease 2019

BMA – British Medical Association

DNA – Did not attend

EM – Emergency medicine

ED – Emergency department

ENT- Ear, nose and throat

FiY – Interim foundation doctor

FY1 – Foundation year 1 doctor

FY2 – Foundation year 2 doctor

GMC – General Medical Council

GP – General practitioner or general practice

OBGYN – Obstetrics and gynaecology.

NHS – National Health Service

N.S – Not significant or non-significant

NSAIDS – Non-steroidal anti-inflammatory medication

PPE – Personal protective equipment

PTSD – Post-traumatic stress disorder

SARS – Severe acute respiratory syndrome

SAS – Staff, associate specialist and specialty doctors

SHO – Senior house officer (Foundation year 2 trainee)

WHO – World Health Organisation

WTR – Working Time Regulations

UK – United Kingdom

US/USA – United States of America

Chapter 1 Background

1.1 Defining burnout and wellbeing

'Burnout' is an occupational syndrome associated with prolonged exposure to emotional and interpersonal stressors in the workplace (Maslach, Schaufeli, & Leiter, 2001). Burnout was first included in the tenth edition of the International Classification of Diseases (ICD-10; World Health Organization, 2004), which stipulates that the term should only be used to describe workplace and occupational phenomena, and not areas of life that are outside of this scope. The three defining features of burnout include 1) emotional and/or physical exhaustion; 2) cynicism or detachment from the job; and 3) a sense of inefficacy or low personal accomplishment. Brill (1984) distinguished burnout from ordinary stress by defining it as a dysphoric and dysfunctional state where recovery is only possible through external intervention or environmental restructure.

Conversely, 'wellbeing', a comparatively ambiguous construct that lacks a single definition or core qualities, is often equated with the World Health Organisation's (1946) definition of 'health' – a state of complete mental, social and physical wellness. Viewed through this conceptual lens, the experience of burnout stands opposed to the notion of being 'well' or possessing a state of wellbeing and balance. Consequently, policies and interventions often aim to improve wellbeing as a means of reversing or preventing burnout.

1.2 Burnout in doctors prior to the Covid-19 outbreak

In October 2018 the British Medical Association (BMA) conducted a survey of burnout in 4,300 doctors and medical students (BMA, 2018b), and found that 80% of participants were at a high, or very high, risk of burnout based on their scores on the Oldenburg Burnout Inventory (OLBI). The OLBI measures two dimensions of burnout: Exhaustion and disengagement from work. The high scores on the survey were linked to high scores on the exhaustion domain. Junior doctors scored highest for likelihood of burnout (91%), followed by general practitioners (GPs) (88%). Being female and working longer hours (>51 hours) were also associated with increased burnout, which was also echoed elsewhere in the literature (Amofo, Hanbali, Patel, & Singh, 2015). A systematic review of research on doctors working in the United Kingdom (UK; Imo, 2017) indicated high levels of psychiatric morbidity (17-52%), and burnout – evidenced by high levels of depersonalisation (17-45%) and emotional exhaustion (31-54%), as well as low levels of a sense of personal accomplishment (6-40%).

Burnout rates were similar across medical and surgical specialities in the UK (Kinman & Teoh, 2018) but first-year foundation year doctors, consultants, and GPs had the highest levels of burnout (Imo, 2017 ; Halliday, Walker, Vig, Hines, & Brecknell, 2017). Furthermore, GPs working in the UK (known elsewhere as primary care physicians) demonstrated higher levels of workplace stress than their colleagues in other countries (see Figure 1; Osborn et al., 2015).

In a survey of UK junior doctors, the Royal College of Physicians (2016) found that nearly 80% of respondents felt their levels of job stress had sometimes, or often, been excessive, and 50% of respondents felt that low staff morale had a serious or very serious impact on patient safety. Research has noted that some aspects of junior doctors’ roles could make them more vulnerable to distress and burnout, such as role uncertainty, frequent rotations, contract concerns, placements where they lack support from seniors, assessments and training requirements, and an overall lack of job control relative to seniors (Spiers et al., 2022; Kinman & Teoh, 2018).

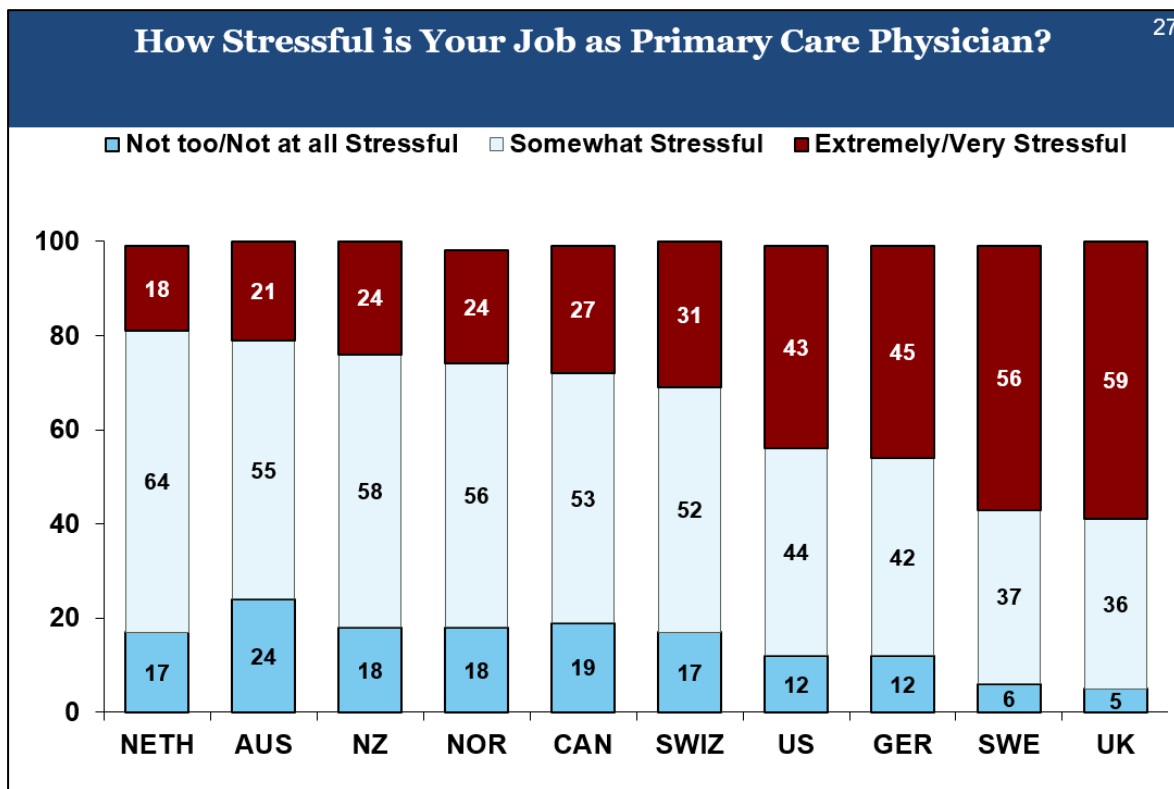


Figure 1 Levels of job-related stress as rated by primary care physicians from ten countries. Reprinted with permission from *Primary Care Physicians in Ten countries Report Challenges Caring for Patients with Complex Health Needs*, by Osborn et al., 2015, retrieved from www.commonwealthfund.org. Copyright 2015 by The Commonwealth Fund.

1.3 Burnout during the Covid-19 pandemic

The coronavirus disease (Covid-19) outbreak was declared a pandemic on 11 March 2020 by the World Health Organisation. It represented a threat to almost all sectors and individuals globally, with a disproportionate effect on healthcare professionals confronting the virus on the 'frontline'. Data from previous pandemics provided an idea of the potential acute and long-term effects on healthcare professionals' health and wellbeing. During the severe acute respiratory syndrome (SARS) outbreak in 2003, healthcare workers in Hong Kong were shown to have high levels of stress, whether frontline working or not, though frontline workers had higher levels of fatigue, poor sleep, and worries about health and social contact (McAlonan et al., 2007). One year after the outbreak, frontline workers showed evidence of chronic stress, with higher levels of anxiety, depression, general stress, and post-traumatic stress. Research in Beijing also showed that healthcare professionals' level of exposure to the SARS outbreak correlated with increased susceptibility to alcohol dependence three years after the outbreak (Wu et al., 2008). Two years after the SARS outbreak in Canada, researchers compared long-term adverse outcomes of healthcare workers in settings treating SARS patients with healthcare workers in other settings (Maunder et al., 2006). In frontline settings, burnout, psychological distress, and post-traumatic stress was 50% more prevalent, while sickness absence, reduced work hours, and smoking, drinking and other unhealthy behaviours doubled. The authors cautioned that future infectious disease outbreaks could have similar repercussions persisting one to two or more years after the disease's resolution.

It is clear that healthcare workers' wellbeing had been negatively affected in previous pandemics. The Covid-19 pandemic evidence, at the time of writing, suggested a similar, if not greater, negative impact from Covid-19. Due to the immense global impact of Covid-19, it is considered a mass traumatic event (Horesh & Brown, 2020). The potential short, medium and/or long-term consequences to healthcare professionals included insomnia, depression, anxiety, burnout, psychological/emotional trauma, acute traumatic stress, post-traumatic stress, secondary traumatic stress, and 'moral injury' – distress caused by behaviours that violate an individual's ethical or moral beliefs (Raudenská et al., 2020; Blanco-Donoso, Moreno-Jiménez, Gálvez-Herrer, Moreno-Jiménez, & Garrosa, 2020).

In 2021, a year after the Covid-19 outbreak, the General Medical Council's (GMC) annual National Training Survey with over 63,000 trainee and trainer doctors in the UK found that all negative wellbeing outcomes were at their worst since the measure was introduced in 2018 (GMC, 2021b). A third (33%) of trainees experienced high or very high degree of burnout due to work, 44% felt their work was emotionally exhausting to a high or very high degree, and 59% always or often felt worn out at the end of the day. A quarter (25%) of secondary care trainers and 22% of GP trainers felt

burnt out to a high or very high degree, while 44% and 55%, respectively, found their work emotionally exhausting. Additionally 71% of GP trainers and 49% of secondary care trainers felt worn out at the end of the working day. The results of seven work-related burnout questions were used to calculate an overall risk of burnout score, categorised as low, medium, or high risk of burnout. Trainees at high risk of burnout increased from the consistent rate of 10% in each pre-pandemic year to 15% in 2021, while trainers similarly increased from the consistent pre-pandemic rate of 9% to 11%.

1.3.1 Covid-19 waves

Unlike other infectious disease outbreaks in recent history, the Covid-19 pandemic was not simply marked by one temporary surge in workload for doctors which then quickly resolved; instead, infection rates fluctuated and 'peaked' over the course of the outbreak. With each surge in Covid-19 case rates, hospital admissions would increase as would Covid-19 related patient deaths. When case rates increased, healthcare professionals were more likely to be in contact with infected individuals and therefore, to prevent the spread of illness, many had to undertake periods of self-isolation, causing severe staffing difficulties in the National Health Service (NHS; Iacobucci, 2022). Legal restrictions on movement (ability to leave one's home, travel, attend workplaces or schools), gathering (ability to meet with people outside one's household), and business (whether businesses could operate, opening hours, and which items could be sold) varied between strict enforcement and relaxation over time, in accordance with infection levels.

In the UK the first 'wave' or 'surge' (high volume) of infections led to the first national lockdown in March 2020 and restrictions began easing in May 2020. This was followed by a period of local lockdowns which were imposed according to level of infection in a given area. A resurgence in infection rates began again in September 2020 leading to a second 4-week national lockdown in October 2020, then a third, final national lockdown at the beginning of January 2021. Between February and April 2022, UK governments phased out all remaining legal restrictions as infection rates remained high but death rates remained low.

The BMA's Covid-19 tracker survey (BMA, 2021a) was administered monthly or every second month to UK doctors between April 2020 and April 2021 and provided an idea of doctors' mental health over the course of the first year of the pandemic. One of the questions asked whether doctors were currently experiencing depression, anxiety, stress, burnout, emotional distress or other mental health conditions relating to work, and whether this was worse than before the start of the pandemic. Comparing the results over time (see Figure 2) indicates an initial reduction in the number

of doctors experiencing mental health difficulties over the summer 2020 period, but there was a subsequent steady increase over the 2020/2021 winter during the second wave.

It is clear, therefore, that the Covid-19 pandemic was not simply a single or consistent threat to healthcare professionals' wellbeing, but the level of impact could fluctuate according to national and local infection rates.

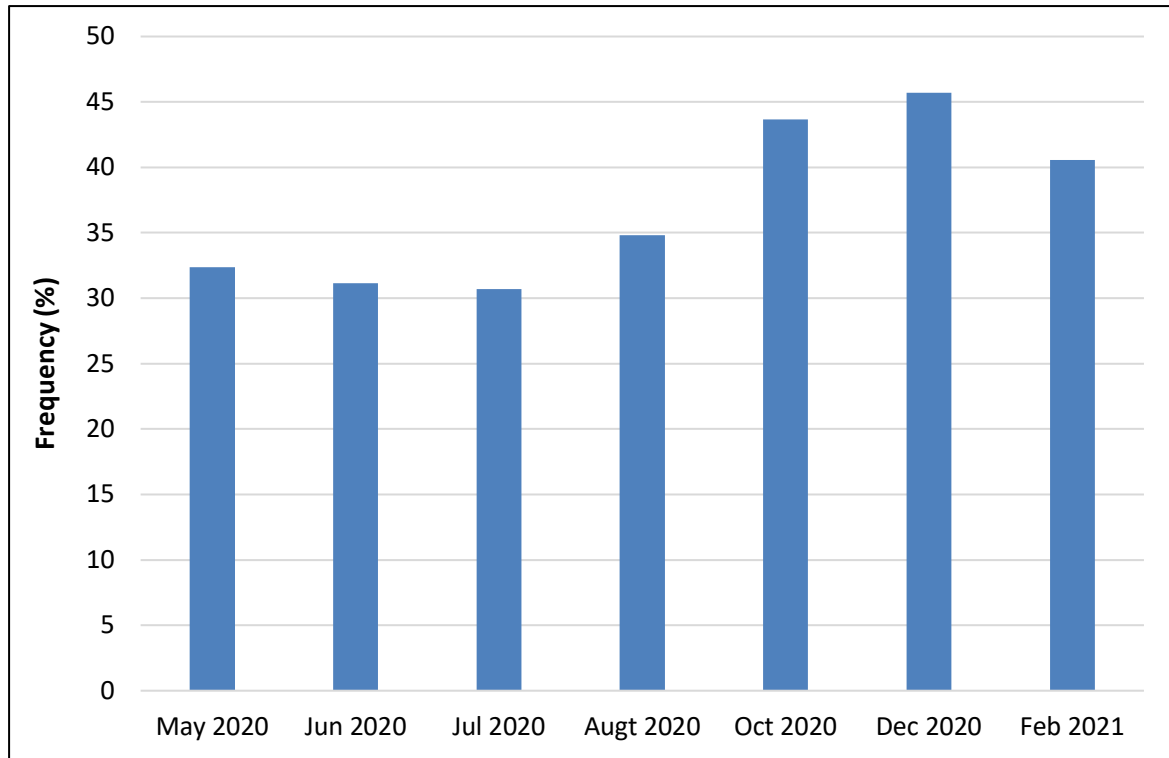


Figure 2 Results from the BMA's Covid-19 tracker surveys. Number of respondents reporting that their experience of depression, anxiety, stress, burnout, emotional distress or other mental health condition was worse than prior to the pandemic outbreak

1.3.2 Medical graduates

At the onset of the pandemic, extraordinary measures were taken to enable the NHS to meet an increased clinical demand in the period of staff shortages due to illness or caring responsibilities. This included the recall of retired staff to practice, and the repurposing of buildings to create ad-hoc hospitals and increase capacity (NHS England, 2020). Another source of help identified were final-year medical students. These students ordinarily graduate in June and commence foundation year one (FY1) placements after provisional registration with the GMC in August. However, in March 2020 the 2019-2020 cohort's graduation was expedited so that they could be given the option to join the workforce immediately to help reduce pressure on the NHS. Eligible graduates then commenced the inaugural, and as yet only, 'interim foundation year' (interim FY or 'FiY') – the term given to the bridging months between early graduation and the planned FY1 placement in August. The GMC

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(2021a) reported that 4,662 FiY posts were created between April and July 2020. The cohort began their FiY placements during the first 'peak' wave of infections and the second wave began approximately two months into their planned foundation year (FY1) placements.

Prior to the Covid-19 outbreak, there were almost 90,000 full-time staff vacancies across the NHS (NHS Digital, 2020b). Amid a pandemic, the 2019-2020 cohort of final-year medical students joined the workforce when levels of clinical demand and uncertainty were exceptionally high and further staff shortages were probable, exacerbating existing pressures on the NHS. Prior to the pandemic, FY1 doctors were shown to be at particularly high risk for ill-being. The GMC (2018) found that burnout peaked at foundation level and gradually reduced as training progressed through to core and specialist training. Mental health is also the most common fitness to practice matter declared by graduates at provisional registration (West & Coia, 2019) – which is required before beginning FY1 placements – and has remained so for several years. In 2020 mental health accounted for 50% of the declarations about health and over 8% of all provisional registration applications (GMC, 2022). It is highly likely that these figures underestimate the true prevalence of psychiatric morbidity in recent graduates, with previous research showing that 31% of FY1 doctors at 336 hospitals throughout the UK met the criteria for psychological morbidity (Paice, Rutter, Wetherell, Winder, & McManus, 2002). With high levels of burnout and psychiatric morbidity among FY1 doctors prior to the Covid-19 outbreak, and the potential for this to be exacerbated by joining the workforce at the start of a global pandemic, there was a need for focused research that considered the effect of pandemic pressures on this uniquely-affected group of junior doctors.

A UK-wide multi-centre cohort study was undertaken to understand the effect of Covid-19 on year 1-5 medical students ($n=592$) and FiY doctors ($n=47$) who graduated early and began working during the first peak of the pandemic (Bandyopadhyay et al., 2021). During the early stages of the pandemic in May 2020, and three months later in August 2020, the researchers found a significant negative effect of Covid-19 on mood in medical students and FiY doctors. All areas of life – including physical wellbeing, financial matters, studies, social life, vacations, research involvement, and future prospects – were significantly more negatively affected than positively affected by the pandemic. In May 2020 (two months after the first national lockdown), just over a third of the FiY sub-group (36%) reported that they had received some form of support from their foundation school and 13% of these participants stated that the support had not been helpful. Nearly half of the FiY sub-group (43%) expressed a desire for more support from their foundation school.

The study by Bandyopadhyay et al. (2021) provides an idea of FiY doctors' mood and experiences over the 2020 summer period (May to August). However, Covid-19 infections waned significantly over this time. The second wave of infections occurred after the study concluded, during the cohort's

first placements in the FY1 role, together with those medical graduates who did not undertake the voluntary FiY placement. There is a need to explore the experiences of FiY-FY1 doctors beyond the 2020 summer. Such research will be important to understanding and supporting this generation of junior doctors both in the short-, medium- and long-term.

1.4 Consequences of burnout

Burnout is linked to a myriad of negative effects on health and work performance. Burnout in doctors has been shown to correlate significantly with medical errors (Shanafelt et al., 2010; West, Tan, Habermann, Sloan, & Shanafelt, 2009), suboptimal self-reported patient care (Shanafelt, Bradley, Wipf, & Back, 2002), low job satisfaction (Imo, 2017), interference with home life (Walsh, 2013), and increased irritability and hazardous drinking (Taylor et al., 2007). Healthcare staff burnout also has also been shown to have a detrimental effect on patient post-discharge recovery outcomes (Halbesleben & Rathert, 2008), levels of patient satisfaction and infection rates (Boorman, 2009), and other measures of patient safety due to staff errors e.g. healthcare provision quality or errors in patient records, number and likelihood of self-perceived errors, and accident propensity (Hall, Johnson, Watt, Tsipa, & O'Connor, 2016).

Further concerns about the consequences of burnout relate to the retention of doctors. Following the Covid-19 outbreak, the BMA's Medical Staffing in England report (BMA, 2021b) suggested that there was a shortage of approximately 49,000 full-time equivalent doctors, and that at the current rate of growth in the profession as well as the general population, there would be an estimated shortage of between 26,889 and 83,779 full-time equivalent doctors by 2043.

A mixed method study to understand why junior doctors left their training programmes in the UK to train overseas between 2003 and 2018 found that there was a high level of burnout (53.8%) in the leavers and that this was reversed once they were practicing overseas for 89.2% of the group (Wilson, Abrams, & Simpkin Begin, 2021).

Following the pandemic outbreak, when asked about career plans in the BMA's April 2021 Covid-19 tracker survey (BMA, 2021a), approximately half (49.5%) of 4,258 doctors were more likely to work fewer hours, approximately a third were more likely to take early retirement, a quarter were more likely to take a career break, and a fifth were more likely to leave the NHS for another career. The most common reasons given, by a considerable margin, were workload (44.9%) - which included the ability to take breaks and leave – and personal wellbeing (43.3%).

More than a decade ago, the NHS Health and Wellbeing Review Interim Report (Boorman, 2009) demonstrated clear financial incentives to the National Health Service (NHS) for investing in staff

wellbeing initiatives and interventions. The review proposed that reducing preventable sickness absence by one third, as other organisations (Royal Mail, BT) have successfully done in the past, could result in annual direct cost savings of approximately £555 million. More recently, research has estimated that poor mental health costs an average of £2,017 annually per employee in health services in the public sector and mental health interventions provide an average return on investment of £5.30 per £1 spent (Deloitte, 2022).

Given the cost of doctors' burnout to staff, patients, and the organisation, there is a clear need for research into the causes of, and solutions for, the high levels of burnout consistently found in doctors working in the UK, under pandemic and typical working conditions.

1.5 Addressing burnout and associated consequences in doctors

To improve the mental wellbeing of NHS staff and learners, recommendations have been made to organisations and policymakers regarding organisational culture, systems, facilities, interventions and support (Health Education England, 2019). Imo's systematic review of burnout in UK doctors (2017) recommended that interventions for doctors should target both individual and organisational levels, including improved support networks, reductions in workload, and changes to contracts.

In 2019 the GMC conducted a UK-wide review into the core requirements for a doctor's mental health and wellbeing in the workplace (West & Coia, 2019). They defined three core needs: *belonging/relatedness* (a need for an inclusive and compassionate work environment), *competence* (a need to provide meaningful outcomes and feeling equipped to do the job) and *autonomy* (an environment where staff feel they have control over their work, and a voice and influence in decisions that affect them). The report advised that attempts to improve wellbeing in doctors will need to ensure that all three needs are consistently met. Six recommendations for immediate action were made to realise the three core needs for doctors. For a sense of *belonging* this included facilitating effective team-work (1) and a compassionate culture (2); for a sense of *competence*, by reviewing excessive workload (3); and for a sense of *autonomy*, through providing more opportunities for meaningful decision-making (4), ensuring work schedule and rotas are realistic (5), and enabling work conditions which allow for adequate rest and recovery (6).

Following Covid-19 and the exacerbation of doctors' stressors, the BMA produced ten recommendations for a long-term strategy to protect the mental health and wellbeing of the medical workforce (BMA, 2022). The first of these was to prioritise the mental and physical health of doctors through safe working environments and supportive cultures, and ensure doctors are able to take regular breaks and access rest facilities. Other recommendations included the provision of wellbeing support, monitoring health and wellbeing to ensure interventions are effective, ensuring wellbeing

support is inclusive and accessible, timely support from occupational health services, providing appropriate treatment for staff with mental health conditions, encouraging peer support and mentoring, making sickness absence processes smoother, allowing leave and flexible working, and proactively preventing suicide among staff and providing bereavement support.

1.6 The role of detachment and recovery

Recommendations for addressing burnout or the retention crisis in doctors often include references to breaks, improvements to rest facilities, and the ways doctors detach and recover from work. Psychological detachment refers to an ability to disconnect from a work situation (Etzion, Eden, & Lapidot, 1998). Recovery is the process during which, following a stress response to a job demand or stressor, an individual returns to their pre-stressor baseline functioning (Sonnentag, Venz, & Casper, 2017; Meijman & Mulder, 1998).

Theories such as the effort-recovery model (Meijman & Mulder, 1998) seek to explain why detachment and recovery are important to wellbeing. This model posits that demands at work result in short-term physiological, behavioural and psychological reactions (known as *load reactions* or *load effects*). When work demands cease, a period of recovery should reverse these short-term effects and facilitate a return to baseline psychophysiological functioning. If recovery opportunities are sufficient and full recuperation from work stress is achieved, the individual starts the following work day with a 'clean slate'; by contrast, if recovery opportunities are insufficient and full recuperation is not achieved, the individual begins the following day in a suboptimal state (Geurts, Beckers, & Tucker, 2014). This suboptimal state necessitates higher effort to maintain performance throughout the day, which places further demands on the compensatory recovery process required following the day's work activities. This creates an accumulation of negative load effects, which ultimately leads to conditions such as fatigue and burnout (Sluiter, Van der Beek, & Frings-Dresen, 1999).

Prolonged exposure to job demands both physically (e.g. working long hours) and/or cognitively (e.g. rumination) sustains psychophysiological activation, and impairs the recovery process; and ongoing exposure to these conditions can result in chronic health conditions (Geurts & Sonnentag, 2006). Conversely, recuperation through psychological detachment from work has a positive effect on wellbeing, mood, levels of fatigue (Sonnentag & Bayer, 2005), job performance, and mental and physical health (Wendsche & Lohmann-Haislah, 2017). Additionally, adequate recovery has been associated with reduced emotional exhaustion (a burnout domain), improved job satisfaction, and organisational citizenship behaviours – voluntary positive contributions to the workplace beyond contracted duties (Hunter & Wu, 2016). Detachment and recovery processes therefore have the

potential to promote wellbeing and protect against burnout and 'ill-being' and are important to consider in doctors.

One study showed that many recently-qualified doctors (57%) were unable to psychologically detach from their work during recovery periods, and for a vast majority (67%) recovery scores indicated a need for a period of detachment and recovery in the near future (Cranley, Cunningham, & Panda, 2016). High workload and fatigue (particularly at times of high time pressure) have been shown to negatively affect recovery and psychological detachment (Sonnetag & Bayer, 2005) and, as these conditions are typical for doctors, it is perhaps not surprising that doctors' work recovery needs are not often met.

Detachment and recovery processes, or the form that these take, can include those strategies used to recover both during and outside of work. Given employers' relative lack of control over employees' actions outside of the workplace, attempts to address burnout should consider the recovery opportunities available within the workplace – namely, intrawork breaks.

1.7 Break taking

1.7.1 Definition

The terminology used for different break-taking behaviours is variable and interchangeable. For this thesis the following definitions are used:

Intrawork breaks are sometimes referred to as *rest breaks*, *restorative breaks* or *natural breaks*. For the purposes of this thesis, *breaks* refer to a cessation of work tasks for a short period during a given shift, allowing the individual to temporarily remove themselves from their workspace (physically and/or mentally). The act of taking a break during the course of work activities will be referred to as *break taking* or *taking a break*, and the continuation of work through this period will be referred to as *break skipping* or *missing a break*. This is differentiated from career breaks, often lasting several months or years, which are taken for various reasons – e.g. to have children, work abroad, travel, or gain experience in a new career. Also sometimes referred to as a 'break' (or a period of *continuous rest*) is the period of time between two shifts (i.e. the time between one shift finishing and the following shift starting) – generally a period of approximately 8-11 hours (BMA, 2016), but this is outside the scope of this thesis.

The Working Time Regulations (the UK version of the European Working Time Directive), is applicable to all doctors and requires a minimum continuous 20-minute rest break after every 6 hours worked. Although doctors can opt out of the limits on working hours, it is not possible to opt out of the

legislation's rest requirements. The 2016 Junior Doctor contract (BMA, 2016) requires a minimum of one paid 30-minute break for any shift lasting more than 5 hours, two 30-minute breaks for any shift lasting more than 9 hours and, as of October 2020, three half-hour breaks on shifts of 12 hours or more.

1.7.2 Consequences of missing breaks

Break taking is not simply a contractual requirement but is also likely to be important to the health and safety of patients and clinicians alike. A large proportion of NHS doctors and nurses are dehydrated during on-call shifts (~30% staff at the beginning of a shift; ~50% staff at the end of a shift) attributed to a lack of break facilities and a culture of missing breaks (El-Sharkawy et al., 2016). Another study showed that doctors in an intensive care unit were twice as likely to be oliguric (low urine output) than their patients, and the authors highlighted a lack of water fountain facilities and opportunities to drink from them (Solomon et al., 2010).

Research from industrial contexts has shown that during periods of continuous work, risk of injury increases when missing a break and rises substantially as time elapses from the last break (Tucker, Folkard, & Macdonald, 2003). The research on shift workers in an engineering company showed that employees were at double the risk of injury at 90-minutes post-break as compared with immediately after. Likewise, when commercial truck drivers on a 10-hour trip took one or two rest breaks of 30 minutes they significantly reduced their fatigue-related accident risk (Chen & Xie, 2014).

Inferring from industry research, working without rest can result in fatigue – a well-researched phenomenon. Fatigue is associated with compromised executive functioning (i.e. impaired planning abilities and increased perseveration – continued pursuit of faulty/erroneous strategies; Van der Linden, Frese, & Meijman, 2003); attentional impairments (Faber, Maurits, & Lorist, 2012); and increased risk-taking (Capanna, Hou, Garner, Yuen, & Hill, 2017). Indeed Allan et al. (2019) found that decision-making in nurses working in a call centre was affected by the length of time since their last break, with each subsequent decision since their break resulting in less effortful, more conservative decisions that were less resource-efficient. This was termed “decision fatigue”. In addition to undermining employees' personal health and safety and efficiency, fatigue was also associated with increased self-perceived medical errors (West et al., 2009). Therefore, fatigue resulting from break skipping may also have a detrimental effect on patient safety.

Having explored the consequences of *missing* breaks, it is important to consider the potential impact of *taking* breaks. In a review of research in industrial settings, Tucker (2003) found that regular break taking maintains employee performance, manages and reduces fatigue, increases alertness (through activities such as eating), and reduces the probability of accident risk due to prolonged exposure to

work tasks. To explain the potential reasons for this effect, Tucker proposed that rest breaks reduce levels of stress by facilitating social interactions between employees and increasing job satisfaction; which subsequently act as stress ‘buffers’ and decrease blood pressure and cortisol levels – common biological markers of stress.

Research with nurses or healthcare professionals as a broad category has also shown some positive effects of breaks on mental health outcomes. A study of nurses in emergency departments in the Netherlands found that within-worktime recovery (breaks) moderated the effect of frequent exposure to emotionally-demanding work on post-traumatic stress disorder (PTSD) symptoms (de Wijn & van der Doef, 2020). The study concluded that greater worktime recovery is associated with less PTSD symptoms. Additionally, a study of 257 clinical and non-clinical staff – 16% of whom were doctors – in an NHS trust during the Covid-19 pandemic found that burnout was significantly affected by three variables, one of which was the ability to rest and recover during breaks (Gemine et al., 2021).

Further research with nurses in Germany found that regular breaks reduced the association between understaffing and subsequent staff turnover rates (Wendsche, Hacker, & Wegge, 2017). This suggests that breaks could have a positive effect on the retention of healthcare professionals.

Research directly examining the relationship of break-taking on doctors’ wellbeing appears scarce in scoping searches. However, research in other occupational groups and NHS staff more broadly indicates potential benefits of breaks to employees’ physical health (e.g. dehydration), decision making, levels of stress and burnout, as well as turnover rates and patient safety. It is therefore pertinent to consider whether break taking could have an effect (positive or negative) on doctors’ wellbeing and/or job performance. Systematic reviews are well placed to begin answering this question as they integrate information from existing literature on a given topic, summarise findings from a wide range of sources, reveal gaps in the literature, and can identify potentially beneficial interventions (Bero & Jadad, 1997). However, at the inception of this programme of work, there was no such review nor quality appraisal of relevant literature to assess the impact of breaks on doctors.

Research Aim:

Undertake a comprehensive review of existing literature on the effectiveness of intrawork breaks for doctors

1.7.3 Break taking in doctors before the pandemic

Prior to the pandemic, 56% of junior doctors described working at least one shift without eating and 75% worked at least one shift without drinking water (Royal College of Physicians, 2016). The

disappearance of rest areas was highlighted as a probable cause, which led to the BMJ launching the “Give Us a Break” campaign to bring attention to the loss of rest facilities for staff (Chatfield & Rimmer, 2019). All NHS trusts in the UK have, in principal, signed up to the BMA Fatigue and Facilities Charter (BMA, 2018a) – a good practice guide to improving facilities and rest opportunities to reduce clinician fatigue and ultimately improve patient safety. The Charter encourages employers to create action plans to: roster breaks (per contract entitlement), ensure breaks are taken, make employees aware of the importance of breaks to maintain performance, and potentially run regular campaigns to encourage break taking. Further lobbying during the 2018 Junior Doctors contract review secured an investment of £10 million from the Department of Health and Social Care to improve rest facilities across NHS trusts (Tonkin, 2019). £6.3 million was used to improve rest facilities across 210 hospital trusts, equating to approximately £30,000 per trust. A further £3.7 million was set aside for 122 trusts who were identified as requiring additional help to improve their facilities (Tonkin, 2020). It is not yet clear whether this has had, or will have, an effect on doctors’ break-taking frequency.

The 2016 Junior Doctor strikes led to the renegotiated Junior Doctors’ 2016 Contract (BMA, 2016), which is applicable to all doctors below consultant level. The 2016 contract introduced exception reporting, allowing junior doctors to report instances when they have worked beyond contracted hours, worked without breaks, and any other concerns about violations of the contract. The Guardian of Safe Working (appointed to ensure compliance with guidelines on safe working hours) is permitted to levy fines against NHS trusts where doctors in training have missed more than 25% of their rest breaks over a 4-week period. To gain an indication of potential cost to trusts, this condition was applied to a team of 35 anaesthetists of varying grades over a busy four-week period (Watts & Prior, 2017): five doctors missed breaks on more than 25% of their shifts and, as levies amount to twice the hourly rate for each break missed, this equated to £907.82 for this particular team. Indeed the *Health Service Journal* (Collins, 2019) found that, between August 2016 and July 2018, over 63,000 exception reports had been received from approximately 36,000 junior doctors, and one NHS trust had received fines totalling over £25,000. This means that there is not only a moral imperative but also a financial necessity for NHS trusts to consider the barriers and facilitators to doctors taking their breaks.

A survey conducted by Health Education England (HEE, 2019) for the NHS Staff and Learners’ Mental Wellbeing Report suggested that 60% of clinical staff had not taken a lunch break at least weekly in the past 6 weeks. While this pertains to healthcare professionals as a broad category, long and unsociable working hours without adequate rest breaks have been described in opinion pieces and personal accounts as the norm for most doctors (Gallagher, 2019; Wijesuriya & Farquhar, 2018). Added to this is a common perception among healthcare professionals that patients should not observe them taking breaks (Royal College of Nursing, 2018).

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While large-scale evidence on doctors' break-taking appears to be limited, the study by Watts and Prior (2017) on a single team of anaesthetists found that early-year specialty trainees were unable to take approximately 23% of their breaks, while the team's senior trainee was unable to take breaks 36% of the time due to inadequate cover. This potentially points to seniority and/or staffing levels as factors that affect break-taking behaviours in doctors, which might suggest that approaches to improving break taking will differ among different grades of doctors. However, a lack of prominent research of this nature indicates a need for investigation into the frequency of break taking and the factors that affect break-taking practices.

Research Aim:

Explore break-taking practices in doctors under pre-pandemic conditions

Research Aim:

Gain a comprehensive understanding of the factors affecting doctors' break-taking practices

1.7.4 Break taking under pandemic conditions

While it is important to explore break taking under typical working conditions, it is yet more pertinent to explore the break-taking landscape under more challenging circumstances. The Covid-19 pandemic was highly disruptive to clinical work environments and many changes were implemented to allow the NHS to deal with high levels of demand. Some examples of these changes are described in section 1.3.2 above. A further example included an agreement between the BMA and NHS that, during the period of extraordinary pressure, the working hours and rest limitations specified by the 2016 contracts would be relaxed temporarily and replaced by the Working Time Regulations 1998 (BMA, 2020). The agreement not only affected work hours but also break and rest entitlement during this time of great pressure.

With high work demands and unavoidable disruption to the workplace, the pandemic was particularly threatening to doctors' wellbeing (see 1.3). Understanding doctors' needs and experiences within the workplace following the Covid-19 outbreak, particularly in relation to rest and recovery, is important to identify effective support that is (or was) available as well as any shortfall. This allows management teams and policy-makers to recognise and implement, where possible, appropriate support for staff presently coping with the consequences of the pandemic, and in planning for future pandemics or similarly impactful major events.

Due to the inherent differences in roles, duties and responsibilities, doctors' workplace experiences and support needs are likely to vary among different grades and levels of seniority, particularly under

pandemic conditions (Pascoe et al., 2021). Focused research among doctors of a given grade could therefore provide a more detailed exploration of the breadth of factors that affect the group's workplace and break-taking experiences. Pre-pandemic research suggested that certain aspects of junior doctors' roles could make them particularly susceptible to distress and burnout (see 1.2; Spiers et al., 2022; Kinman & Teoh, 2018). Among junior grades, the 2020 cohort of medical graduates not only faced the pre-existing workplace stressors that result in high levels of psychological morbidity in FY1 doctors under typical working conditions (Imo, 2017), but also new stressors posed by starting their careers during the global pandemic.

With early evidence supporting the postulation that Covid-19 could have a detrimental effect on doctors, and junior doctors being particularly at risk, it is pertinent to explore the impact of the pandemic on their work environments, wellbeing, and the potential protective effect of recovery and break-taking practices, with a focus on the 2020 medical graduate cohort as they navigated the novel FiY and FY1 landscapes. Additionally, as the pandemic moved through waves of infection with fluctuating effects on doctors' wellbeing, it is important to examine if there was a varying effect of pandemic pressures at various time points.

Research Aim:

Explore the effect of the Covid-19 pandemic on the workplace experiences and break-taking practices of junior doctors over the course of the first year of the pandemic

1.8 Summary

Given the relative importance placed on taking breaks by policy makers, and then operationalised by recent investments and contractual guidelines, it is important for research to empirically explore intrawork break taking in UK doctors. The literature available at the time of writing and reviewed in this chapter indicates a high likelihood of missing breaks (Gallagher, 2019), a lack of rest facilities (Tonkin, 2019), and potential detriment to staff and patient safety when breaks are missed (West et al., 2009). Conversely, adequate detachment and recovery promotes wellbeing, has the potential to reduce turnover, and research from industry suggests that intrawork break taking has the potential to maintain employee performance and alertness and reduce levels of risk, fatigue and stress (Tucker, 2003). Poor break-taking practices could therefore be a factor in doctors' burnout, though existing literature directly examining this relationship appears scarce.

Where research exploring break taking in doctors exists, it is often in contexts far removed from doctors' working environments or it tends to involve a broader group of healthcare professionals as the population of interest (e.g. Health Education England, 2019). Such research with healthcare providers as a whole does not take into consideration that doctors, nurses and allied health

professionals will have significantly different caseloads, working hours, rotas, attitudes to break taking, workplace cultures, and varying levels of physically-, emotionally- and psychologically-demanding tasks. Additionally, Watts and Prior's (2017) study on anaesthetists' break taking presents an interesting finding with regard to break skipping increasing alongside seniority. However, studies of this nature are rare and existing research does not appear to take into account that there are likely differences in workplace experiences between different specialties and grades of doctor. The evidence base on break taking is therefore likely to benefit from a focus on doctors of all grades as a population of interest to gather data on group-level views and experiences, as well as focused work among the various permutations of doctor grades and specialties.

This indicates a need for investigation of the potential effectiveness of breaks to doctors' wellbeing, an exploration of doctors' pre-pandemic break-taking practices and perceptions of breaks, and a thorough understanding of the mechanisms that promote or hinder break taking. Additionally, the Covid-19 outbreak represented a substantial threat to doctors' work environments and wellbeing, suggesting a need for further research on break taking under pandemic conditions. With high levels of burnout under normal conditions and disproportionate levels of disruption to their (accelerated) careers due to the pandemic, research is needed to explore the effect of pandemic conditions on FiY and other junior doctors' workplace experiences and break-taking practices.

1.9 Research questions

Given the gaps in understanding at the time of this project's inception, the following research aims and resulting research questions were posed:

Aim 1: Undertake a comprehensive review of existing literature on the effectiveness of breaks for doctors

1. What is the evidence for the effectiveness of breaks to doctors' wellbeing and/or job performance?

Aim 2: Explore pre-pandemic break-taking practices in doctors of all grades

2. How often do doctors take breaks at work?
3. Do doctors perceive breaks as important to their wellbeing?

Aim 3: Gain a comprehensive understanding of the factors affecting doctors' pre-pandemic break-taking practices

4. What factors affect doctors' break-taking practices?
5. How do junior and SAS doctors describe the factors affecting their break taking?

6. How do junior and SAS doctors define and perceive breaks?
7. How can break-taking practices or usefulness be improved?

Aim 4: Explore the effect of the Covid-19 pandemic on the workplace experiences and break-taking practices of junior and SAS doctors over the course of the first year of the pandemic

8. Does foundation doctor break-taking frequency change under pandemic conditions?
9. Do foundation doctors' perceived importance of breaks change under pandemic conditions?
10. Does foundation doctor break-taking frequency and/or importance change at different times during the pandemic?
11. Do factors affecting junior and SAS doctors' break-taking practice change under pandemic conditions?
12. How do the factors affecting junior and SAS doctors' break taking under pre-pandemic conditions change under pandemic conditions?
13. How do junior and SAS doctors describe break taking and workplace experiences under pandemic conditions?
14. How can junior and SAS doctors' break-taking practices or usefulness be improved under pandemic conditions?

1.10 Structure of thesis

The aims and research questions of this thesis are addressed through the following structure:

Chapter 1 has outlined the background literature and provided the rationale for this project's aims and research questions.

Chapter 2 describes the research approach, methodology and methods chosen to investigate the project's research questions.

Chapter 3 presents the results of the systematic review of literature on the effectiveness of break-taking for wellbeing and work performance in doctors.

Chapter 4 describes the results of a pre-pandemic survey with doctors of all grades on their experiences and perceptions of break-taking practices.

Chapter 5 describes the results of follow-up interviews with pre-pandemic junior and SAS doctors on the factors affecting break taking in the workplace, and the interventions that could be implemented to improve break-taking practices.

Chapter 1

Chapter 6 presents the results of longitudinal surveys undertaken prior to and during the Covid-19 pandemic to understand first-year foundation level doctor's break-taking practices and perceptions under 'typical' and pandemic conditions.

Chapter 7 describes the results of follow-up interviews undertaken with junior doctors of all training grades and SAS doctors at the beginning of the Covid-19 outbreak, and with first-year foundation level doctors one year later, to understand the changes or similarities in doctors' workplace experiences and break-taking practices under pandemic conditions.

Chapter 8 summarises the project's findings, describes a conceptual model to understand the breadth of factors that affect doctors' break practices, experiences, and perceptions, provides directions for future research, and describes the implications of the project's findings for policy and decision making.

Chapter 2 Methodology

2.1 Research approach: Mixed methods

The broad range of aims and questions posed by the narrative literature review in Chapter 1 necessitates a variety of investigative methods. The 'what' or 'does' questions lend themselves to quantitative methods whereas the 'how' or 'why' questions are inherently qualitative in nature. A mixed methods approach was therefore adopted to explore the overall research aims.

Neither quantitative nor qualitative research but a third option "that often will provide the most informative, complete, balanced, and useful research results" (Johnson, Onwuegbuzie, & Turner, 2007, p.129), *mixed methods research* draws on the strengths of both and compensates for their weaknesses. Where quantitative research is criticised for researchers' distance from participants and lack of understanding of context, qualitative methods remedy this; where qualitative research is criticised for bias in interpretations and a lack of generalisability, quantitative methods provide a solution (Creswell & Clark, 2017). Some therefore consider mixed methods research a superior option to using either (mono-method) approach alone (e.g. Kelle, 2006; Johnson et al., 2007).

While a mixed methods approach can be thought of predominantly in terms of its combination of quantitative and qualitative methods in practice, it has also become known as a 'worldview' of its own (Ghiara, 2020), placing importance on the mixed method researcher's philosophical and paradigmatic orientation.

2.2 Philosophical paradigms

Historically, a choice of research 'movement' (i.e. qualitative or quantitative) would often point to a researcher's paradigmatic orientation, that is, "the consensual set of beliefs and practices that guide a field" (Morgan, 2007, p.49). While mixed methods research has become known as the third paradigm or 'methodological movement' (Johnson et al., 2007), it does not inherently impose a particular paradigm. Conversely, through its combination of two once-opposing approaches, it grants more paradigmatic choice to researchers. For this reason, it is important for mixed methods researchers to outline their paradigmatic assumptions.

Paradigms are made up of four components: 1) *ontology*: what constitutes reality and what can be known about it, 2) *epistemology*: forms of knowledge and how it is created and communicated, 3) *methodology*: the overarching strategy and motivation for a researcher's choice of methods, and 4) *methods*: the particular techniques used to collect and analyse data (Rehman & Alharthi, 2016).

Paradigms are predominantly based on assumptions of ontology and epistemology, which are then conveyed in their methodology and methods (Scotland, 2012).

2.3 Ontology and epistemology

As a basic summation, quantitative research is often dominated by the positivist paradigm, which proposes that there is one observable, identifiable truth, while qualitative research lends itself to constructivist or interpretivist paradigms, which hold that there is no single observable truth but rather reality is constructed by individuals and groups. Though mixed methods research can be viewed through a range of paradigmatic lenses (e.g. Shannon-Baker, 2016), many prominent mixed methods researchers advocate for pragmatism as the natural and logical ‘middle position’ paradigm for research seeking to combine these two divergent worldviews (e.g. Morgan, 2007; Johnson & Onwuegbuzie, 2004).

As a research paradigm, pragmatism posits that neither positivism nor constructivism alone are sufficient to understand reality, instead adopting an outcome-oriented approach that favours the most appropriate philosophy or methodology for a given research question – “a needs-based or contingency approach to research method and concept selection” (Johnson & Onwuegbuzie, 2004, p.17). Epistemologically, importance is therefore placed on what the researcher deems the best approach to answering a research question. With a focus on usefulness and practicality, the underlying aim of pragmatist research is to identify practical, meaningful solutions to problems, making it an important paradigm within, for example, social justice research (Kaushik & Walsh, 2019).

Pragmatism considers knowledge as both constructed by individuals and based within a ‘real world’. Consequently, pragmatists’ ontological view of reality is that it is layered and fluctuating: It is sometimes subjective, sometimes objective and sometimes a mixture of both (Feilzer, 2010). It holds that our experiences are limited by the constraints of reality, but our understanding of reality is limited by our interpretation of those experiences (Morgan, 2014).

Pragmatism considers the importance of not only individual experience, but also cultural and historical context (Morgan, 2014). It is suggested that as pragmatism places importance on the interaction between individuals and environments, it is particularly apt for studying occupational phenomena, which require a holistic view and plurality of methods and sources (Shank, 2012).

As break-taking is itself a complex occupational construct (likely an interaction of individual experiences and contexts in which individuals work), pragmatism’s flexibility in examining both subjective and objective realities allows for a thorough examination of the factors that influence

doctors' break-taking practices. Additionally, as an underlying aim of this research is to explore meaningful solutions to improve doctors' wellbeing, pragmatism is an appropriate paradigmatic approach, both philosophically and methodologically.

2.4 Methodology: Mixed method design

Due to the multitude of opportunities offered by mixing both quantitative and qualitative designs, mixed method typology and classifications can be exceptionally complex and lengthy (e.g. Teddlie & Tashakkori, 2006; Greene, Caracelli, & Graham, 1989). Leech and Onwuegbuzie (2009) offer a simplified classification system that adequately captures the options available to mixed methods researchers. The system is based on three dimensions: 1) *level of mixing* – the degree to which quantitative and qualitative methods are combined in a) the research objectives, b) type of data to be collected, c) data analysis, and d) interpretation (classified as 'fully mixed' if methods are mixed in one or more of these phases, or 'partially mixed' if only mixed at interpretation); 2) *time orientation* – whether the methods are combined simultaneously throughout the research process or in succession (classified as 'concurrently' or 'sequentially' respectively); and 3) *emphasis of approaches* – the degree to which either quantitative or qualitative methods are given greater priority in answering research questions (classified as 'equal' or 'dominant'). The different combinations on these dimensions result in a total of eight different typologies. This classification system was applied to the current research aims to decipher the most appropriate methodology.

The research aims and questions of this project are diverse and, apart from the systematic literature search, are intricately linked to one another. Quantitative and qualitative methods are therefore, for the most part, 'fully mixed' at the objectives, data collection, analysis, and interpretation phases of the research. As the concept of break-taking is assumed to be complex and likely a combination of both subjective and objective phenomena, both quantitative and qualitative research are given equal priority and dominance in the data collection. Additionally, a sequential design is most appropriate as the quantitative '*what*' questions organically precede the explanatory '*how*' or '*why*' questions to be asked, and because, on a practical level, the quantitative phase is used for sampling participants for the qualitative phase. This results in a fully mixed sequential equal status mixed method design.

While a fully mixed sequential equal status mixed method design is the overall and predominant design for this research, some methods (e.g. systematic review) take place outside of this framework and were conducted separately and/or concurrently where this did not affect or impede the value of the fully mixed sequential research. However, results of all methods are integrated at the interpretation stage of the research (Chapter 8).

2.4.1 Chronological phases

As there were two chronological phases to the research, namely the pre-pandemic outbreak and post-pandemic outbreak phases, the sequential equal status mixed method design was incorporated twice under the different conditions (see Figure 3a). These conditions were referred to as pre-pandemic ('typical') conditions and post-pandemic outbreak conditions respectively.

Figure 3a



Figure 3b

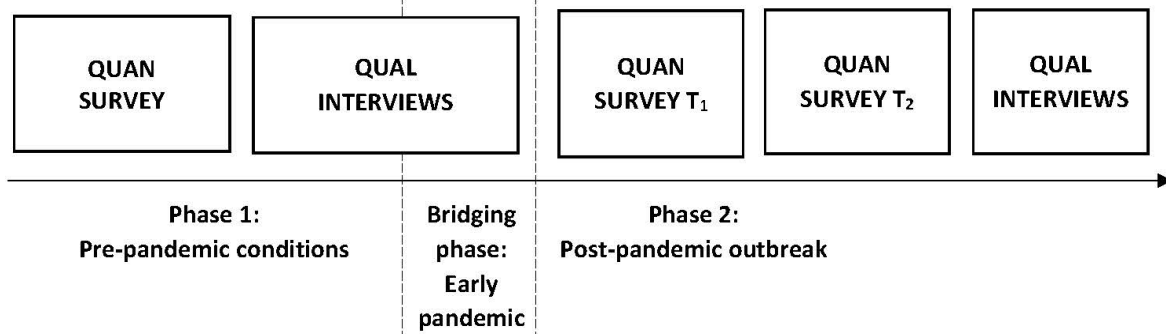


Figure 3 Mixed methods design. As per Leech and Onwuegbuzie's (2009) notation, capitalisation denotes equal or dominant status, arrows denote sequential timing and "+" denotes concurrent timing of methods.

Additionally, given that the research aims for phase 2 include the exploration of the pandemic impact across time, an embedded longitudinal design is required. Van Ness, Fried, and Gill (2011) propose two options for longitudinal mixed methods research: 1) a *prospective* design, where qualitative data are collected at the beginning of the longitudinal quantitative data collection, and 2) a *retrospective* design, where qualitative data are collected at the end of the longitudinal quantitative data collection. Prospective designs are appropriate for exploring participants' expectations of the data to be collected, whereas retrospective designs are appropriate for exploring participants' recollected experiences of the measurement of interest. As the primary purpose of the follow-up qualitative data is to explore participants' experiences rather than their expectations, a retrospective design best suited the second longitudinal mixed method phase. However, it should be noted that as a proportion of the interviews from the first phase coincided with the beginning of the pandemic, discussions turned to expectations of the pandemic and its potential future-oriented effect on participants' wellbeing (see section 2.5.3.1). Consequently, although the phase 2 design is

predominantly retrospective in nature, some elements of prospective design are included in the triangulated data collection and interpretation. Figure 3b illustrates the timeline of data collection events as they relate to the mixed methodology design.

2.5 Phase 1 Methods

Below are the rationale and justifications for methods selected to investigate each proposed research question in the mixed method design. Further detailed analysis, procedures, recruitment and sample descriptions for each method are provided in the chapters that follow. Figure 4 provides a contextual timeline of data collection alongside broader national and global events.

2.5.1 Systematic review

Question 1: What is the evidence for the effectiveness of breaks to doctors' wellbeing and/or job performance?

The first question posed by the background literature outlined in Chapter 1 relates to the existing evidence on doctors' break taking. As initial scoping searches did not yield many results, an in-depth, thorough, and systematic search through multiple sources was required to 1) provide a comprehensive overview of what is currently known about the effectiveness of breaks for doctors' wellbeing and/or performance, and 2) critically appraise the results. A *scoping review* provides an overview of evidence in a given area, however, it does not seek answers to specific questions (e.g. on effectiveness) nor does it critically appraise literature (Munn et al., 2018). In contrast, a *systematic review* uses explicit, reproducible searches to synthesize and appraise existing literature on a research question (Gopalakrishnan & Ganeshkumar, 2013) and is an appropriate method to address both objectives.

If a systematic search yields sufficient data of the same type that can be meaningfully combined, a meta-analysis can be done to produce a quantitative, statistical estimate of the net effect of the phenomenon being investigated across the studies (Crombie & Davies, 2009). With sufficient similarity and overlap, meta-analysis would be undertaken on the data. However, given the breadth of the review, it was likely that the data yielded by this search would not be sufficiently similar for a quantitative meta-analysis. Given the exploratory aims of this project, it was more important to provide an exhaustive overview and appraisal of existing research on the topic than to artificially narrow it for quantitative synthesis. Consequently, a systematic review with a qualitative synthesis and appraisal of the data was a suitable approach to answering the research question.

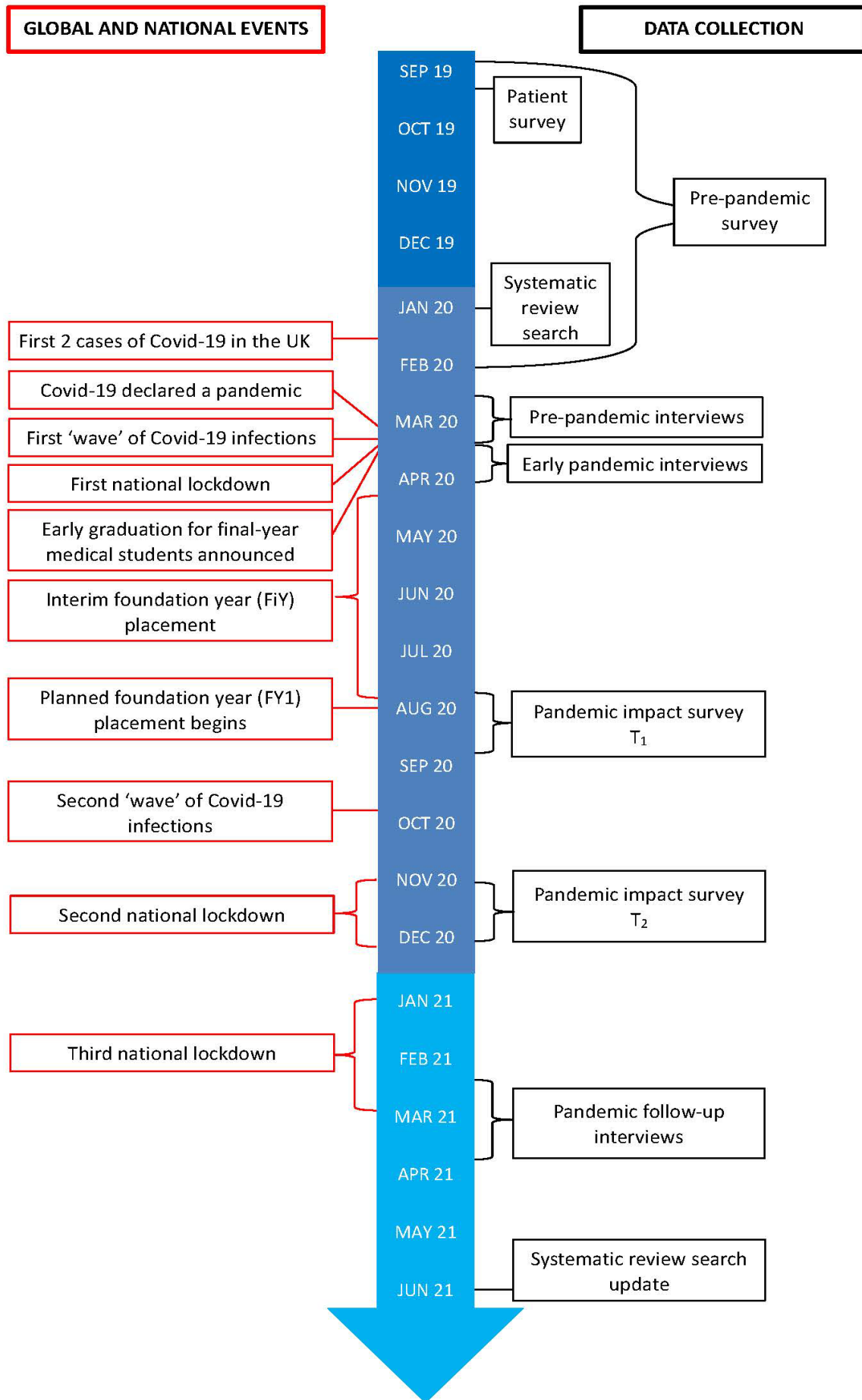


Figure 4 Timeline of data collection events alongside global and national events

As a phase of research that occurred outside of the sequential mixed method design, the systematic review was conducted concurrently among other methods in phase 1 and 2. Chapter 3 provides further details on the review method, data extraction and analysis.

2.5.1.1 Data synthesis

Data from included papers were qualitatively synthesised. As the aim of the search was to assess whether break taking affects job performance and/or wellbeing, the synthesis described eligible papers according to whether breaks: 1) improve, 2) reduce, or 3) have no effect on doctors' job performance and/or wellbeing. Though not required for inclusion, data on break-taking prevalence, facilitators and/or barriers to breaks were also of interest to the aims of this project and were therefore described where applicable.

2.5.2 Quantitative methods: Survey

Question 2: How often do doctors take breaks at work?

Question 3: Do doctors perceive breaks as important to their wellbeing?

Question 4: What factors affect doctors' break-taking practices?

As the frequency of break taking in doctors, and the factors that affect it, was not apparent in existing literature, it was important to use an exploratory approach to gain an overview of the group-level answers to these two questions. Survey research provides the opportunity to directly consult participants and gain an idea of group-level trends, attitudes, behaviours, experiences and intentions in a relatively short period of time (Driscoll, 2011; Wilson & MacLean, 2011). The distribution of a survey to a large group of doctors of varying grades (including consultants and junior doctors of all training grades) and specialties therefore allowed for the exploration of a diverse range of experiences and opinions about break-taking frequency and the factors that affect it. Chapter 4 provides details on recruitment, sample characteristics, and data collection.

As break frequency and factor selection are inherently quantitative research questions, a predominantly quantitative approach was taken and emphasised in analysis and interpretation. Opportunities for qualitative input were supplementary options in the survey structure which were coded for themes and quantified. Surveys therefore formed the first quantitative phase in the sequential mixed method design(s) (see Figure 3).

To investigate the research questions, four questions were posed by the survey regarding: 1) prevalence or frequency of break taking, 2) barriers to break taking, 3) possible facilitators for breaks, and 4) the self-perceived importance of breaks to doctors' wellbeing.

2.5.2.1 Data analysis

Data on break-taking frequency, factors affecting break taking (barriers and facilitators), and perceptions of break importance are presented as relative frequencies. Supplementary (qualitative) textual comments were coded for recurring themes and also quantified as relative frequencies. As the aim of this first phase of research was not to compare data but rather to explore a single cross-sectional snapshot of break practice and perceptions, inferential statistics were not conducted on the data.

2.5.2.2 Supplemental data: Public survey

Question 4: What factors affect doctors' break-taking practices?

Doctors' break-taking behaviour occur in a complex organisational system and culture. Doctors not only face the expectations of seniors and colleagues, but also those of patients and their relatives or visitors. To further assist the comprehensive exploration of factors affecting doctors' break-taking practice and provide a more thorough understanding of the opportunity cost (for the individual and the system) in taking breaks, a small-scale ($N=14$) in-person survey was piloted with members of the public on their perceptions of doctors taking breaks. The purpose of this exercise was to gather preliminary data on public views regarding the importance (or otherwise) of doctors taking breaks at work, as well as the acceptability of observing doctors taking a break to explore whether this might affect doctors' break-taking practice to inform a larger study. As a small information-gathering exercise within the broader body of work for this thesis, the results are a supplement to the main survey data and are not described in the main body of this thesis. The methods and results are described in Appendix A and the implications for future research are discussed in the final discussion (Chapter 8).

2.5.3 Qualitative methods: Follow-up interviews

While the survey data provided an overview of the frequency of break taking, and an initial exploration of *what* potential barriers and facilitators might affect this, a more nuanced follow-up discussion was necessary to explore the concept of *how* these factors, or others not captured by the survey, affect break taking. Additionally, further exploration of doctors' perceptions of breaks, how breaks are defined, and the interventions that could improve break practices necessitated richer qualitative discussion. The methods used for this type of discussion are generally focus groups or interviews. Given doctors' highly varied work schedules, recruitment to focus groups would potentially prove difficult. Additionally, the level of disclosure among near-peers and direct (or

indirect) superiors in focus groups was thought to be potentially problematic. As a result, to assure participants' confidentiality and encourage open discussion, interviews were selected.

Interview typologies typically define three method choices: 1) structured interviews; 2) unstructured or in-depth interviews; and 3) semi-structured interviews (Britten, 1995). *Structured interviews* are similar to surveys as a list of questions are prepared and posed to participants in the same way in each interview, and allow only fixed responses. This method is made redundant by the use of the preceding survey. In *unstructured (in-depth) interviews* the interviewer takes a passive role, generally only asking one broad question to begin the conversation and only probing or clarifying concepts without directing the conversation in any particular direction. These interviews are typically lengthy. *Semi-structured interviews* are a middle-ground method where questions are prepared in advance of the interview but the interviewer can be flexible in their approach, not having to ask all the questions but rather allowing the interviewer-interviewee interaction to naturally guide the direction of the interview (Wilson & MacLean, 2011). These interviews allow for prepared topics to be addressed to a vague extent while pursuing unforeseen, unprepared leads or directions (Adams, 2015). Semi-structured interviews can vary in length though are typically shorter than unstructured in-depth interviews.

The research questions for this project specify broad topics to address through the interviews, but also advocate for leads in other directions. As a result, a semi-structured approach was best suited to the research aims. Indeed, some researchers (e.g. Adams, 2015) describe semi-structured interviews as the most appropriate method for mixed method inquiry that aims to follow up survey data. In addition to the method's suitability for the research aims, as an inherently flexible method regarding timing and location of interviews, semi-structured interviews were also suitable on a practical level for the structure of doctors' working days.

While the preceding survey intended to understand broad group-level views and perceptions of break taking among all doctor grades (junior doctors and consultants), the follow-up interviews aimed to provide greater depth and nuance in a subset of survey participants' experiences. Consequently, the qualitative data focused on junior and SAS doctors, including a variety of junior training grades and specialties.

2.5.3.1 Interview phases

Question 5: How do junior and SAS doctors describe the factors affecting their break taking?

Question 6: How do junior and SAS doctors define and perceive breaks?

Question 7: How can break-taking practices or usefulness be improved?

The first phase of semi-structured interviews occurred in different chronological phases in relation to the Covid-19 outbreak, which coincided with interview data collection: 1) Interviews prior to the Covid-19 pandemic under 'typical' conditions, also referred to as 'pre-pandemic' interviews; and 2) interviews which occurred in the very early stages of the pandemic outbreak in a 'bridging phase' between 'typical' and post-pandemic outbreak conditions (see Figure 3b).

The aim of pre-pandemic interviews was to follow up on the preceding survey data with doctors of all grades (including consultants and junior doctors) and examine a subset of junior doctor participants' perceptions of breaks, how various factors affect them, and the potential interventions that could be implemented to improve break-taking practice under normal working conditions. While ongoing, this first phase of qualitative interviews coincided with the outbreak of Covid-19 and, as a result, approximately half of the interviews were conducted prior to the outbreak (under 'typical' conditions) and half were conducted in the very early stages of the pandemic. The final 'pre-pandemic' interview took place approximately 1 week before the first 'early pandemic' interview (described in relation to the first UK national lockdown and the presence of Covid-19 content in interviewee narratives).

The aim for early pandemic interviews remained the same: To follow-up the results of the survey in a subset of junior doctors. However, the working landscape facing doctors was already changing to adapt to the pandemic and discussions from this point naturally encompassed both the 'old' and 'new' conditions facing doctors – i.e. 'typical' pre-pandemic working conditions and pandemic conditions. The inherent flexibility of semi-structured interviews allowed for, and encouraged, this very relevant deviation from the original lines of questioning. Because the pandemic was only just beginning, the topic guide was largely adhered to, in addition to (and apart from) discussions about the early effects of the outbreak. For this reason the data from these early pandemic interviews in the 'bridging phase' were separated and used to answer research questions about 'typical' pre-pandemic working conditions, and pandemic impact questions.

2.5.3.2 Interview data analysis

There are a multitude of analysis options for interview data. This can include *grounded theory*, where the aim is to identify categories, model relationships, and generate theory; *content analysis*, where the frequency and quantification of words or phrases are the focus; *narrative analysis*, where participants' stories and how they construct them are the object of investigation; or *discourse analysis*, where language and linguistic concerns are the focus (Hammond & Wellington, 2013; Thorne, 2000). An additional, popular qualitative analytical technique or category is *thematic analysis*. Once considered a sub-category or analytical tool within broader analytical categories such as grounded theory, thematic analysis has become increasingly accepted as an analytical category of

its own (Braun & Clarke, 2006). Thematic analysis is used to identify patterns and categories as a means of organising and describing a given data set (Braun & Clarke, 2006). As the research objectives for the qualitative data in this project are to identify factors and recurring ideas in the data, rather than understanding story construction or quantifying speech, thematic analysis is the most appropriate option for the analysis of follow-up interview data.

Broadly speaking, there are two approaches to generating themes in thematic analysis: 1) the inductive approach; and 2) the deductive approach. *Inductive thematic analysis* uses a bottom-up approach to appraise raw data for emergent codes, themes and relationships and is best suited to investigations of broad, underlying structures of experiences (Thomas, 2006). *Deductive thematic analysis* uses a top-down approach to appraise data against an already existing structure or framework of themes and is best suited to answer a particular question or aspect of the data (Hammond & Wellington, 2013; Braun & Clarke, 2006). Given the project's pragmatist orientation, neither an inductive approach nor a deductive approach is strictly imposed, but rather whichever best serves the research aim. Additionally, pragmatism allows for the movement between both inductive and deductive approaches where appropriate, in a third approach called *abduction* (Kaushik & Walsh, 2019; Morgan, 2007). The initial follow-up interviews were exploratory in nature, aiming to explore the raw data for broad themes ('factors') that negatively or positively affect break-taking practice under typical conditions. Therefore, an inductive line-by-line approach best served the aims of data analysis at this stage.

In the early pandemic 'bridging phase' interviews, data was coded as 'pandemic' or 'non-pandemic'. Data relating to typical, pre-pandemic working conditions was separated for inductive thematic analysis alongside the other pre-pandemic phase 1 interviews. The data relating to the early effects of the pandemic was separated for analysis alongside the phase 2 interview data.

2.6 Phase 2 Methods

2.6.1 Participant recruitment during the Covid-19 pandemic

During the second phase of data collection (April 2020 to February 2021) there were multiple national and local lockdowns across the UK in response to surges in Covid-19 infections. Restrictions not only affected access to clinical spaces but also to clinical staff as participants. To continue this body of research (remote or otherwise) with doctors already working in the NHS, ethical approval was required from the Health Research Authority (HRA) and the University of Southampton ethics committee. The research would also require approvals and letters of access from individual NHS Trusts where participants would be recruited. While these approvals were granted for the first phase

of data collection, the HRA warned of lengthy delays in approvals due to their prioritisation of research directly relating to Covid-19 (e.g. diagnosis, treatments). To comply with funding and PhD timelines, a solution was found that 1) minimised potential loss of time by requiring only University ethics approval, 2) continued the narrative of this work – allowing for an understanding of the pandemic’s effect on break taking in a group of doctors, and 3) explored a unique, time-sensitive, and important research opportunity.

Exploratory survey and interview data were collected from a cohort of final-year medical students at the University of Southampton, whose graduation was accelerated in March/April 2020 to allow them to join the NHS and alleviate pandemic-related pressures, becoming the first (and thus far only) interim foundation year (FiY) doctors. This cohort was recruited as students, immediately prior to their graduation, and followed up as they began their FiY placements and planned FY1 placements. Their experiences, alongside those of the junior doctors of all training grades who were interviewed at the onset of the pandemic in the early pandemic phase (see 2.4.1 and 2.5.3.1), constituted a second phase of exploratory data collection, allowing for a thorough exploration of the topic of intrawork break taking in UK junior doctors before and during the Covid-19 pandemic.

2.6.2 Quantitative methods: Pandemic impact survey

Question 8: Does foundation doctor break-taking frequency change under pandemic conditions?

Question 9: Do foundation doctors’ perceived importance of breaks change under pandemic conditions?

Question 10: Does foundation doctor break-taking frequency and importance change at different times during the pandemic?

Question 11: Do factors affecting junior and SAS doctors’ break-taking practice change under pandemic conditions?

To explore the factors that might affect break-taking practice and doctors’ perceptions of breaks under pandemic conditions, the same quantitative survey used in phase 1 was administered to a cohort of newly qualified FiY (latterly FY1) doctors located across the UK following the outbreak of the Covid-19 pandemic. This allowed for comparisons of break-taking frequency, value, and identification of the factors affecting break-taking practice under the new working conditions. This survey formed the first quantitative phase of the second sequential mixed method design in this project (see Figure 3a).

To investigate whether responses regarding break-taking frequency or importance changed over the course of the pandemic, the survey was administered at two different time points (T_1 and T_2). Break-taking practice was examined three months and six months after the doctors began working to examine not only whether break-taking practice changed due to pandemic conditions (compared with 'typical' pre-pandemic conditions), but also whether it changed at different points in time during the pandemic (see Figure 3b).

2.6.2.1 Data analysis

As one of the aims of the pandemic data were to compare break-taking practice over time, and the survey data are measured at nominal or ordinal level, non-parametric tests were used to test differences over time. Mann-Whitney U tests (also known as Mann-Whitney-Wilcoxon or Wilcoxon rank-sum tests) were used to investigate whether break-taking frequency differed in pre-pandemic (phase 1) versus post-pandemic outbreak (phase 2) conditions. The Fisher-Freeman-Halton exact test investigated differences between pre-pandemic and post-pandemic outbreak perceptions of break importance. Stuart-Maxwell tests (also known as Marginal Homogeneity tests) were used to investigate any differences over the course of the pandemic (phase 2) measurements (T_1 vs. T_2). To explore whether the factors affecting break taking differed between pre-pandemic and pandemic conditions, the relative frequencies and ranking of barriers and facilitators to break taking were descriptively compared between the three survey time points (i.e. pre-pandemic and post-pandemic outbreak T_1 and T_2). Section 6.1.1 in Chapter 6 provides greater detail on the inferential statistics and rationale behind their selection.

2.6.3 Qualitative methods: Pandemic impact follow-up interviews

Question 12: How do the factors affecting junior and SAS doctors' break-taking practice under pre-pandemic conditions change under pandemic conditions?

Question 13: How do junior and SAS doctors describe break taking and workplace experiences under pandemic conditions?

Question 14: How can junior and SAS doctors' break-taking practices or usefulness be improved under pandemic conditions?

As with the initial follow-up interviews, the 'pandemic impact' phase of interviews followed up the pandemic impact survey for a deeper understanding of the pandemic's effect on the cohort approximately one year after the pandemic outbreak, while Covid-19 was still a prevalent global and occupational threat. At the time of the interviews, the cohort had completed the FiY placements and the first six months of their FY1 year. As described above (see 2.5.3.1), the data from the interviews

with the FiY (FY1) cohort were combined with the early pandemic interviews with doctors of various junior grades to form the collective pandemic interview data as described from two different temporal perspectives.

As in phase 1 interviews, the phase 2 interviews sought to understand how various factors interacted to affect doctors' break-taking practices under pandemic conditions. This allowed for comparisons with the findings under typical, pre-pandemic conditions. As the semi-structured interview format allowed for participant narratives to deviate from the break-taking topic guide if necessary, participants were able to describe and reflect on workplace experiences that were not only directly related to break taking but also their workplace experiences and wellbeing more broadly. The data therefore describes their break practices as well as the wider landscape and context in which intrawork breaks took place.

2.6.3.1 Data analysis

To explore qualitative differences between the factors affecting break-taking practices and work environments under pandemic conditions compared with pre-pandemic 'typical' conditions, phase 2 interview data were compared against phase 1 interview results to decipher similarities and deviations. Whereas the data in phase 1 was inductively analysed and the coding was based on participants' experiences alone, the data in phase 2 were analysed through the lens of pre-determined phase 1 categories. Therefore, the approach in phase 2 was predominantly deductive.

2.7 Integration of phase 1 and phase 2 data

Due to the equal status of quantitative and qualitative methods in this body of work, as well as the sequential design, integration of the mixed methods data occurred 1) *within* each chronological phase between the quantitative and qualitative components (e.g. survey results informed questions asked in follow-up interviews in both phases); 2) *between* each phase (e.g. quantitative phase 1 and phase 2 findings are directly compared in Chapter 6, and the coding structure of phase 1 qualitative data is used for the deductive analysis in phase 2); and 3) *across* phase 1 and phase 2 as a whole in the final chapter (Chapter 8). The final chapter integrates the findings of phase 1 and phase 2 at the interpretation phase of the research.

By summarising and interpreting the results of phase 1 and 2 together, the final chapter is able to describe the progress made in advancing the conceptual understanding of doctors' break-taking practices throughout this thesis. Although grounded theory is required to build in-depth *theories*, which explain why particular concepts are important and/or why they relate to each other in certain ways, Morgan (2018) proposes that it is possible to use the themes and categories that result from

thematic analysis to form low-level theories, known as *models*. Models describe the relationships between a set of concepts or themes and merely observe that there *is* a relationship, but do not necessarily have the ability to understand *why*. Where the triangulation of qualitative and/or quantitative data from phase 1 and 2 allowed, a conceptual model was a possible outcome of this exploratory research.

2.8 Reflexivity

While paradigmatic and ontological views have an important influence on data collection and analysis, qualitative data collection can also be affected by the interaction between researcher and participant, often involving a co-operative generation of knowledge (Dowling, 2006). Although the semi-structured interview method allows for participants to guide the conversation, the interviewer maintains relative control over the overall topic of the interview. It is therefore important to acknowledge that the researcher's professional background, social position, and previous experiences can affect the data generated by interviews (Berger, 2015).

All interviews were conducted and analysed by one female researcher, a South African immigrant to the UK, who described herself as an 'outsider' to the medical profession. Given the overriding purpose of the research, the researcher's motivation lay in finding solutions and interventions to improve doctors' wellbeing, accounting for the system-level barriers identified in the narrative literature review (Chapter 1). To limit the impact of these biases and perceptions, the researcher emphasised her 'outsider' status and suppressed her personal opinions and viewpoints in her dialogue and questions, while maintaining a conversational tone and rapport. If participants enquired, these discussions were held after the interview had concluded. At the start of interviews, the researcher framed the interview explaining that she was 'not a medic', that her academic background was in Psychology and Cognitive Neuroscience, that the interviews were a new and immersive experience for her, and that they formed part of broader research on doctors' wellbeing. However, the framing, as well as the researcher's follow-up questions about phenomena that is otherwise taken for granted in the profession, could have skewed the answers given by participants. Participants might have limited their answers or expanded on subjects that they felt the researcher would understand or be interested in. To further limit the impact of the researcher's biases and perceptions, data collection and analysis was overseen by the researcher's supervisor, Professor Julia Sinclair, who has extensive qualitative research experience and offered external input and differing perspectives. It is important to recognize this as the context for the qualitative data presented in the chapters that follow and the lens through which it was analysed.

Chapter 3 Systematic Review

As outlined in Chapter 1, initial scoping searches suggested that, when healthcare professionals miss their breaks, there is potential risk to staff and patient safety. A review of research in industrial settings (Tucker, 2003) suggested that break taking has the ability to mitigate fatigue and accident risk, maintain performance and improve alertness. However, it remains unclear whether intrawork breaks improve doctors' wellbeing and performance at work as, at the time of writing, no review had been conducted on break-taking literature in this population, despite the importance of the information to healthcare settings and policy makers.

The objective of a systematic review is to identify any relevant research papers on a given topic and appraise the quality of each study's design and execution (Crombie & Davies, 2009). The review should provide an impartial summary of existing evidence. This chapter aims to impartially summarise and appraise the literature on intrawork break taking in doctors and decipher whether the evidence indicates any clear benefits of breaks to their wellbeing and/or performance at work. This data will also help to explore any gaps in the evidence, particularly in UK doctors.

A summary of this work has been published in *BMJ Open* as: [O'Neill, A., Baldwin, D., Cortese, S., & Sinclair, J. \(2022\). Impact of intrawork rest breaks on doctors' performance and well-being: systematic review. *BMJ Open*, 12\(12\), e062469.](#)

3.1 Aims

To comprehensively review existing literature, appraise the quality thereof, and assess whether it demonstrates benefits of breaks to doctors' overall wellbeing and/or the performance of their duties in the workplace, a systematic review was conducted of any relevant existing empirical literature. The primary outcome of the systematic review was any measured effect(s) of break taking on doctors' wellbeing and/or job performance.

To provide further evidence for this project's research questions, secondary outcomes were explored in the included literature, though they were not a pre-requisite for inclusion in the review. Secondary outcomes included: 1) The range of definitions and measurements of break taking, 2) prevalence of break-taking, and 3) barriers or facilitators to break taking.

3.2 Method

This systematic review was designed and is reported here in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021). The PRISMA Statement ensures transparency, accuracy and completeness in the reporting of systematic reviews (Sarkis-Onofre, Catalá-López, Aromataris, & Lockwood, 2021). Guidelines from the Cochrane handbook, the gold standard for rigorous systematic review methods, were also implemented, where relevant and practicable, to the design and conduct of this review.

The protocol for this review was prospectively registered with the International Prospective Register of Systematic Reviews (PROSPERO; O'Neill et al., 2020).

3.2.1 Inclusion criteria

The review included any empirical literature investigating the impact of intrawork breaks on doctors' wellbeing and/or job performance. The terms 'breaks', 'wellbeing' and 'performance' are expanded upon below to clarify the review's inclusion criteria.

As outlined previously (section 1.7.1) the word 'break' is a broad term which lacks a single definition. It is used interchangeably and can refer to: a) a pause in a given work day (e.g. a lunch break), b) the time between two subsequent work days or shifts, and/or c) a temporary break in one's career. Therefore, in order to limit the search to relevant literature only, a clear operational definition and set of criteria was required to set the parameters for inclusion and exclusion in the review. The definition needed to specify the type of break under investigation (i.e. within or between shifts), a typical location, and a temporal limit. The definition and criteria needed to be broad enough to capture all relevant literature whilst inherently excluding as many non-relevant sources as possible to make the search feasible in the allotted time.

'Breaks' were defined as: A cessation of work tasks for a period of up to 1 hour during a given shift, allowing the individual to temporarily remove themselves from the workspace, physically and/or mentally. The 1-hour time limit was based on other industries where lunch break durations are typically a maximum of 60 minutes. In the context of sleep-related break interventions, this time limit also helped to differentiate naps during breaks from overnight sleep during on-call shifts. 'Breaks' could include opportunistic or scheduled rest breaks during shifts, or break interventions, which could include: mandatory breaks, break activities (e.g. yoga, meditation, exercise), or increased break frequency, duration, or varied timing of breaks. Where study designs necessitated a comparator this could include usual practice, missed breaks, less frequent breaks, shorter break durations, or other break activities.

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Like the term 'break', the primary outcome measures for this review, 'wellbeing' and 'job performance', are broad constructs that lack a single operational definition. Systematic reviews often narrow their search to focus on particular aspects of broad outcome measures to ensure similarity across studies and allow for cross-comparison. However, as this review represented the first to investigate this topic in doctors, the aim was to be as comprehensive and exhaustive as possible, capturing the breath of research in the field. Consequently, the search attempted to capture as many working definitions of the constructs as possible.

In this review, wellbeing outcomes included any measures of, or related to, mental health, physical health and quality of life (e.g. anxiety, musculoskeletal injury, fatigue). Work performance outcomes included any measures of, or related to, clinicians' ability to carry out their duties at work, such as errors, adverse events, appraisals, patient feedback, quality of care, revalidation, ability to meet targets and so forth. As the definitions were broad, outcomes relating to wellbeing and work performance could overlap (e.g. sickness absence, perceived stress). However, it was not the intention of the review to divide the two constructs but rather to be inclusive of any papers investigating either, or both, outcomes. Research papers in the fields of occupational wellbeing and work performance were consulted to compose an extensive list of terms relating to the outcomes.

Accounting for the above definitions, criteria for inclusion in the review were:

- 1) Any empirical study design
- 2) Undertaken in a population of qualified medical doctors ($\geq 50\%$ of the sample)
- 3) Meeting all of the following criteria:
 - a) An investigation of the effectiveness of breaks (using wellbeing and/or work performance measures)
 - b) breaks were taken within working hours (intra-work)
 - c) breaks and/or comparators were less than 1 hour in duration
 - d) break activities could not include work-based activities (e.g. reflective practice or administration)

Studies were excluded if:

- 1) The break under investigation occurred outside of work hours;
- 2) The break under investigation was a work-based activity
- 3) Qualified doctors did not constitute the majority of the sample ($< 50\%$);
- 4) The design was not empirical (e.g. opinion pieces, reviews, theoretical modelling).
- 5) The break duration was longer than 1 hour

No restriction was placed on study design (quantitative or qualitative), language, location, or date of publication to ensure any knowledge on the subject was captured by the search.

3.2.2 Database search

To ensure adequate and efficient coverage of available literature, the electronic search was carried out in the Embase, PubMed, Web of Science (Core Collection), and PsychINFO databases, using Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH). Based on the number of unique references each database contributed to a sample of systematic reviews, Bramer, Rethlefsen, Kleijnen, and Franco (2017) estimate that this combination of databases should ensure at least 83% coverage of available literature. However, the figure is likely to be higher in this review due to PsychINFO being a comparatively more relevant database to this subject area than those reviews included in their calculation. The addition of Google Scholar could provide approximately 13% more coverage, totalling a minimum of 96% coverage of the available evidence on the topic. However, the addition of a Google Scholar search in its entirety often represents a significant and unnecessary burden for researchers. Consequently, at the recommendation of a subject librarian, the first 10 pages of Google Scholar results were retrospectively checked for unique references to assess whether a full Google Scholar search was necessary. To further supplement the search, reference lists of included research papers were also searched for additional papers not retrieved by the search strategy.

The initial database search was performed in January 2020 and subsequently repeated in June 2021 to ensure the review encompassed, as much as feasibly possible, any relevant literature prior to analysis of the results.

3.2.2.1 Search terms

The search was reviewed and approved by a subject librarian and comprised four blocks of terms and their synonyms relating to: 1) medical doctors, 2) breaks, 3) the workplace, and 4) an outcome measure of wellbeing (e.g. burnout, stress, anxiety, fatigue) and/or work performance (e.g. errors, job performance indicators, quality of care, turnover). The searches were adapted for each database (see Appendix A) and performed using the Boolean operators AND and OR.

3.2.3 Screening and selection

The search results were imported into EndNote X9® software. Duplicates were automatically removed using the software's duplicate search function, followed by a thorough manual search for duplicate entries not detected by the search. Following the second, updated database search, the

two resulting EndNote libraries were combined and the duplicate removal process was repeated. Two assessors independently assessed each study's title and/or abstract against the inclusion criteria before meeting to discuss their results, with an agreement rate of 98.2%. If disagreements occurred between assessors, consensus was achieved through arbitration by the project's primary supervisor (Prof Julia Sinclair). When abstracts indicated potential relevance to the review, corresponding full-text papers were evaluated for inclusion. If full-text articles were not available in accessible databases, through inter-library loan, and/or relevant information was not fully explained in the text, authors were contacted for relevant data via up to two emails. Following requests to authors, if corresponding peer-reviewed reports were not available, conference abstracts were assessed and those with sufficient information for data extraction were included in the review.

3.3 Data extraction and analysis

Data extracted from eligible studies included: first author, year of publication, participant demographics (training level/seniority, specialty/department, gender), study location, sample size, study design, definition/type of break, interventions/activities under investigation (and any comparators), evaluated outcome measurements and associated results. If reported, data extraction also included break frequency, timing, and duration, as well as barriers and facilitators to break taking. Data extraction for each study was completed by the author using a standardised table. This was verified by the author's primary supervisor (Prof Julia Sinclair) throughout the extraction process.

Data were tabulated for cross-comparison and descriptive analysis. The outcomes of included studies were narratively described according to whether they improve, reduce or have no effect on wellbeing and/or job performance outcome measures.

Meta-analysis would provide a useful statistical estimate of the net benefit of breaks to doctors. However, while rare overlaps existed between studies (e.g. measures of burnout), the heterogeneity in study designs, interventions, and outcome measures meant that neither the dataset as a whole nor a subset thereof were sufficiently similar for meta-analysis. An expert in systematic review methods (Prof Samuele Cortese) confirmed that a quantitative synthesis would produce spurious and unreliable findings.

3.4 Risk of bias

It is important to undertake a risk of bias assessment for individual studies included in a systematic review as the results of each study contribute to the interpretation(s) of the findings, their relevance,

and the overall conclusions of the review (Boutron et al., 2019). The PRISMA statement distinguishes between *risk of bias* assessments (biases in a study's design, conduct or analysis of results which affects the overall findings) and *quality* assessments (a broader term that can go beyond bias in the findings by including concepts such as imprecision, conflicts of interest, ethics, external validity, and reporting completeness) (Page et al., 2021). It suggests the focus of critical appraisal should be on identifying bias in the design, conduct, and analysis of studies. Consequently, this review focuses predominantly on risk of bias assessments in its appraisal of studies, however, a note on overall study quality is made in the discussion section to include risk of bias as well as, for example, sample size considerations. For this review, risk of bias assessments were not used to include or exclude studies from the review but rather to gain an understanding of the quality of research in this field.

Many risk of bias tools and checklists combine assessments on multiple questions or domains into a single composite score. However, Cochrane explain that these scores can skew the findings of syntheses and can be difficult to interpret. They therefore advise that risk of bias assessments be made on domains, or components, of a study (Boutron et al., 2019). Similarly, in the PRISMA reporting guidelines it is recommended that authors provide their assessment for each domain or component of a risk of bias tool, as opposed to simply listing one composite score, as this allows readers to understand the specific areas in a given study where bias was of concern (Page et al., 2021).

Per Cochrane guidelines (Boutron et al., 2019) risk of bias assessments were made by two reviewers independently, and trial registers and pre-registered protocols were sought where full-text reports did not provide sufficient information. To allow for more accurate assessments of bias, follow-up studies included in the review were assessed separately from original studies if the design and/or participants were dissimilar to the original paper.

Per Cochrane guidelines (Boutron et al., 2019), the Cochrane risk of bias tool (ROB-2) was used for randomised control trials and the Cochrane ROBINS-I tool was used to assess non-randomised studies of interventions. Both Cochrane tools consist of signalling questions to aid users in their risk of bias assessments for each domain. The risk of bias rating for each domain then allows for an overall risk of bias assessment for the study (ROB-2: low risk of bias, some concerns, high risk of bias; ROBINS-I: low, moderate, serious, or critical risk of bias, or no information).

For other experimental designs, risk of bias assessment was completed using the relevant Joanna Briggs Institute (JBI) checklists for cross-sectional, cohort, and qualitative studies. The choice to use the JBI checklists in place of other commonly used tools such as the Newcastle Ottawa Scale (Wells et al., 2018; Farrah, Young, Tunis, & Zhao, 2019) was due to the fact that the JBI suite of checklists includes a qualitative study checklist and therefore prevented the use of another dissimilar scale.

Like the Cochrane tools, JBI checklists do not provide a single score but rather an assessment of various components in each study design. Each question is answered with “yes”, “no”, “unclear” or “not applicable”. Unlike the Cochrane tools, JBI checklists do not provide an overall risk of bias assessment. To allow for some intra- and cross-study comparison, the frequency (%) of possible “yes” answers within each study and across studies are indicated. These frequencies were not intended as a composite quality score nor used to make value judgements on inclusion, they are simply used for easier visual comparison of components across studies.

As JBI checklists contain less detail than Cochrane tools, the rationale for JBI ratings is given in Appendix C.

3.5 Results

Following the removal of duplicates, the titles and abstracts of 10,557 records were assessed for inclusion in the review. Full-text reports were sought for 110 records eligible for review. Supplementary searches of the reference lists of these articles yielded 2 further records. The retrospective Google Scholar search produced no unique references and a more comprehensive search was therefore deemed unnecessary. Of the 112 full-text articles screened, 32 records met the criteria for inclusion. As three of these records reported follow-up data to original papers, 29 of the 32 records contain unique participants and topics. However, the follow-up studies provided sufficient new information (or methods) to warrant inclusion in the review as separate records. Figure 5 shows the PRISMA flow diagram.

Tables 1 to 4 summarise the characteristics for studies meeting inclusion criteria, with a legend of terms and abbreviations at the bottom of the fourth table. Appendix D provides further details and a summary of findings for each study. The terminology used to describe doctors and their grade or seniority within each study is preserved in the description of each study’s findings. For example, where UK studies describe a “consultant doctor”, a study conducted in the United States (US) might refer to “faculty physicians”. The naming conventions have not been transcribed into the UK classification system in order to preserve any nuanced differences between the different systems, ensuring better accuracy in the summary of results.

As study designs and the type of break under investigation substantially varied, the included studies are grouped into categories by intervention and data type to allow for a degree of narrative cross-comparison. This includes quantitative studies of standard 30-minute breaks, sleep-related interventions (naps), yoga and mindfulness interventions, microbreaks in surgery, other microbreak interventions, and surveys and cohort studies. Qualitative data are grouped into qualitative evaluations of interventions and other qualitative studies.

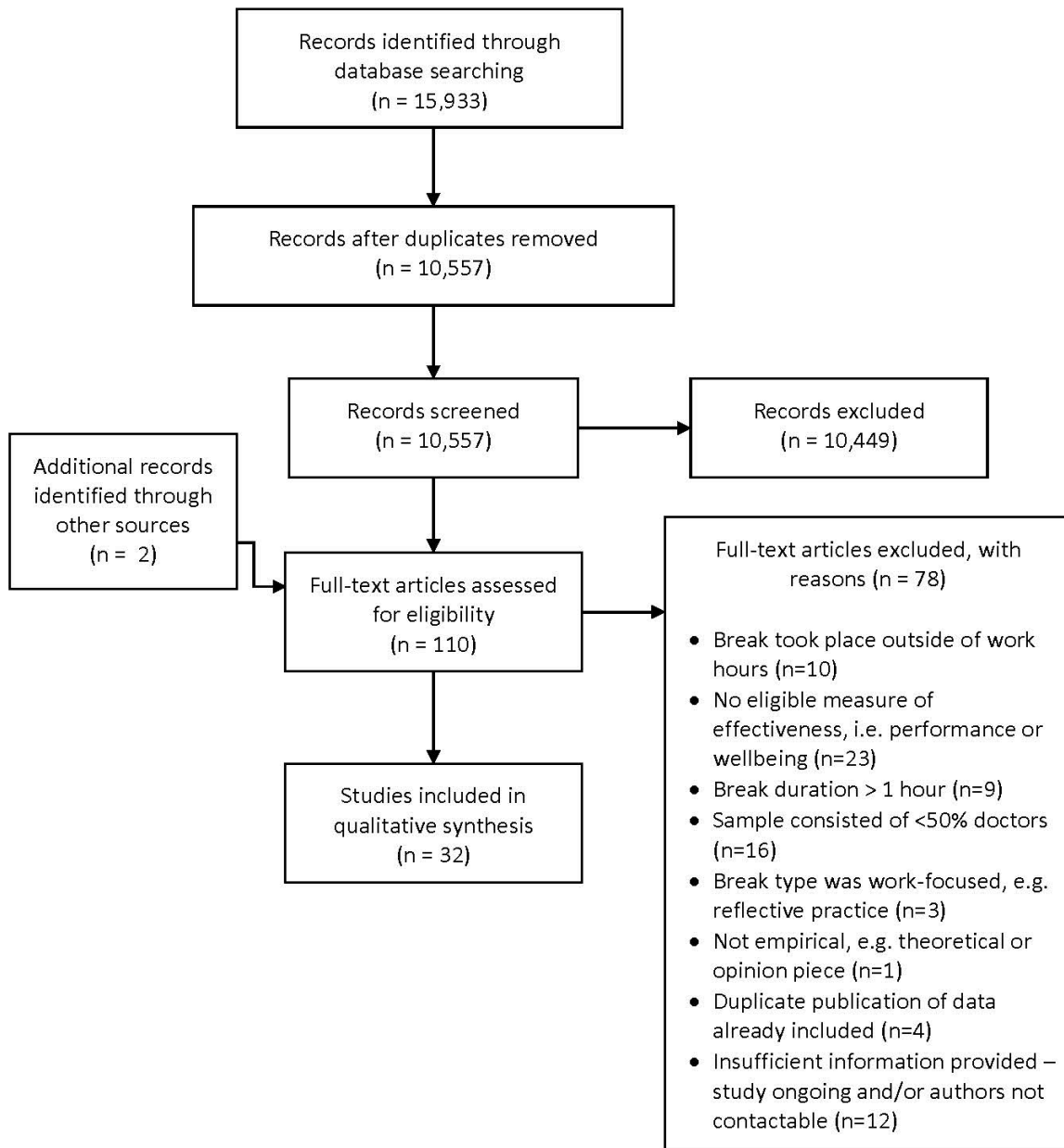


Figure 5 PRISMA flow diagram. Based on: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Table 1 Characteristics of quantitative interventional studies included in the systematic review

First author (year)	Location	Design	Participants (N); Male/Female (M/F) ratio	Intervention category	Intervention and comparator description	Type of publication
Coburn (2006)	Germany	Randomised cross-over trial.	N=30 anaesthesia residents; 63.3% Male	Standard 30-minute break	30-min breaks in a recreation room vs no break during 7.5 hour shifts	Published report
Mitra (2008)	Australia	Before-and-after study	N=121 baseline and N=112 post-intervention surveys from ED doctors of all grades; M/F ratio not reported	Standard 30-minute break	Baseline/usual practice phase vs promotion of 30-min uninterrupted breaks (facilitated by cover doctor, educational sessions and posters)	Published report
Amin (2012)	USA	Cluster non-randomised control trial.	N=29 first year internal medicine residents; 58.6% Male	Sleep-related intervention	20-min midday naps in a recliner chair during daytime shifts vs controls who lay in chair but conversed with researcher for 20 mins	Published report
Smith-Coggins (2006)	USA	Randomised control trial	N=49 emergency department staff (n=25 doctors, n=24 nurses); 32.7% Male	Sleep-related intervention	40-min nap opportunity at 3AM during a 12-hour night shift vs continued work	Published report
Babbar (2019)	USA	Before-and-after study	N=25 OBGYN residents and maternal-fetal medicine fellows; M/F ratio not reported	Yoga and mindfulness	Weekly 1-hour yoga sessions held within protected education time	Published report
Babbar (2021)*	USA	Before-and-after study	N=13 OBGYN residents and maternal-fetal medicine fellows; M/F ratio not reported	Yoga and mindfulness	Weekly 1-hour yoga sessions held within protected education time	Published report *Follow-up to Babbar 2019
Ireland (2017)	Australia	Randomised control trial	N=44 emergency medicine interns; 36% male	Yoga and mindfulness	Weekly 1-hour mindfulness sessions for 10 weeks vs 1-hour midday break per week	Published report

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First author (year)	Location	Design	Participants (N); Male/Female (M/F) ratio	Intervention category	Intervention and comparator description	Type of publication
Scheid (2020)	USA	Before-and-after study	N=12 faculty physicians; 0% male	Yoga and mindfulness	Baseline/usual practice vs weekly 1-hour yoga sessions for 6 weeks during work hours	Published report
Dorion (2013)	Canada	Randomised crossover trial	N=16 surgeons (staff and residents); M/F ratio not reported	Microbreaks	Control vs 20-second micropauses every 20 mins during prolonged (2 hour minimum) surgery	Published report
Engelmann (2011)	Germany	Randomised crossover trial	N=7 paediatric surgeons; n=51 operations; 85.7% male	Microbreaks	5-min intraoperative breaks every 30 mins (25-min work then 5-min break) vs control (no breaks)	Published report
Engelmann (2012)*	Germany	Randomised control trial	N=7 paediatric surgeons and N=52 paediatric patients; Surgeons 85.7% male	Microbreaks	Patient outcomes and surgeon perceptions of 5-min intraoperative breaks every 30 mins (25-min work then 5-min break) vs control (no breaks)	Published report *Follow-up to Engelmann 2011.
Hallbeck (2017)	USA	Before-and-after study.	N=56 attending surgeons; 67.9% Male	Microbreaks	Control surgery day with no breaks vs one day of 1.5-2 min intraoperative microbreaks with guided exercises every 20-40 mins	Published report
Lemaire (2010)	Canada	Before-and-after study	N=20 medical, surgical, and primary care staff physicians; 85% male	Microbreaks	Standard/usual practice day vs one day of micro-food-breaks (delivery of 6 small daily meals)	Published report
Mengin (2021)	France	Randomised control trial	N=47 ear, nose and throat residents; 47.7% male	Microbreaks	Effect of listening to a 5-min guided mindfulness meditation vs control track prior to a simulated consultation where physicians break bad news to patients	Published report

Table 2 Characteristics of survey and cohort studies included in the systematic review

First author (year)	Location	Design	Participants (N); Male/Female (M/F) ratio	Break type or topic of investigation	Type of publication
Al Dandan (2021)	Saudi Arabia	Cross-sectional survey	N=198 clinical radiology residents, senior registrars and consultants; 56.1% Male	Break-taking prevalence as a predictor of digital eye strain	Published report
Berastegui (2020)	Belgium	Observational prospective longitudinal study	N=28 emergency department physicians; 60.7% male	Association between fatigue reduction strategies with a) reaction time, and b) burnout.	Published report
Hassan (2020)	Egypt	Cross-sectional survey	N=278 surgical and medical resident physicians; 46.4% male	Association between break prevalence and level of work stress	Published report
Hockey (2020)	England, UK	Observational prospective longitudinal study	N=565 doctors in training (core, foundation, & specialty trainees); 42% male	Association between breaks and positive and negative affect	Published report
Kalboussi (2020)	Tunisia	Cross-sectional survey	N=46 anaesthetists of varying grades; 11% male	Association between taking breaks at work (among other occupational factors) and burnout	Published report
Kirkcaldy (2002)	Germany	Cross-sectional survey	N=309 doctors and consultants who own a medical practice; 63.4% Male	Association between break duration and occupational stress, motor vehicle accident rates, and work-related accident rates	Published report
Neprash (2018)	USA	Retrospective cohort study	N=2,805 primary care physicians (n=703,612 appointments); M/F ratio not reported	Opioid, NSAID and physical therapy prescribing rates immediately before and after breaks of >15 mins (during appointments where opioids were likely inappropriate)	Conference presentation* *Report published did not include break data.
Nitzsche (2017)	Germany	Cross-sectional survey	N=152 private practice haematology and oncology physicians; 73% Male	Association between breaks, emotional exhaustion and work-home conflict	Published report

First author (year)	Location	Design	Participants (N); Male/Female (M/F) ratio	Break type or topic of investigation	Type of publication
Ohlander (2015)	Sweden & Germany	Cross-sectional survey	Swedish sample: N=85 physicians; 60% Male German sample: N=561 physicians; 48.5% Male	Association between break duration and work stress in two different countries	Published report
Vosshenrich (2021)	Switzerland	Retrospective cohort study	N=117,402 reports written by n=27 residents; M/F ratio not reported	Effect of lunch breaks on number of corrections made to resident reports in proofreading process	Published report
Winston (2008)	England, UK	Cross-sectional survey	N=328 hospital doctors of varying grades; M/F ratio not reported	Break prevalence and healthy eating behaviours	Published report

Table 3 Characteristics of qualitative studies included in the systematic review

First author (year)	Location	Design	Participants (N); Male/Female (M/F) ratio	Intervention or break-related topic of investigation	Type of publication
Lemaire (2011)*	Canada	Intervention study. Before-and-after evaluation using semi-structured interviews	N=20 medical, surgical, and primary care physicians; 85% Male	Standard/usual practice day vs one day of micro-food-breaks (delivery of 6 small daily meals)	Published report *Follow-up to Lemaire 2010
Lockhart (2013)	Canada	Intervention study. One-group post-test only design using qualitative survey evaluation	N=5 rheumatology fellows; M/F ratio not reported	1-hour circuit-training-style exercise session for 12-week period instead of lecture as part of academic half-day	Conference abstract
Hall (2018)	England, UK	Single occasion focus groups	N=25 general practitioners (locums, salaried, trainees, and partners); n=5 focus groups; 44% Male	Breaks as potential strategy to improve general practitioner wellbeing	Published report

First author (year)	Location	Design	Participants (N); Male/Female (M/F) ratio	Intervention or break-related topic of investigation	Type of publication
Morrow (2014)	England, Scotland, Wales, & Northern Ireland (UK)	Focus groups and telephone interviews	N=82 medicine, surgery and psychiatry foundation and specialty trainees; 44% Male	Effect of UK Working Time Regulations on trainees' experience of fatigue (including effect on breaks and rest periods)	Published report
O'Shea (2020)	USA	Focus groups	N=116 resident and attending physicians in ED; M/F ratio not reported	Beliefs about taking breaks for self-care while on shift	Published report
Walsh (2005)	Canada	Semi-structured individual interviews	N=21 female family medicine residents; 0% Male	Effect of access to breaks on ability to breastfeed when returning to work from maternity leave	Published report

Table 4 Characteristics of the mixed method study included in the systematic review

First author (year)	Location	Design	Participants (N); Male/Female (M/F) ratio	Break type and/or topic of investigation	Type of publication
Wilkesmann (2016)	Germany	Sequential mixed method design	N=43 qualitative semi-structured interviews with hospital physicians; N=2,598 quantitative surveys from surgeons and anaesthetists (residents excluded); M/F ratio not reported	Impact of breaks on opportunities for physicians to 'share ignorance' (detect unknown things and share them, ability to learn from failures) or 'hide ignorance' (intentionally prevent knowledge sharing) Ignorance: A known or unknown lack of knowledge	Published report

Tables 1-4 Legend and Abbreviations: 'Trainees' – includes any/all training grades and 'resident' doctors, unless specifically stated. Consultants – fully trained in specialty (includes 'staff', 'attending', and 'faculty' physicians/ surgeons). M/F – Male/Female. Min(s) – Minute(s). OBGYN – Obstetrics and gynaecology. NSAIDS – non-steroidal anti-inflammatory medication. UK – United Kingdom. USA – United States of America.

The publication dates of studies meeting the inclusion criteria ranged from 2002 to 2021. The studies were conducted in 13 countries (excluding follow-up studies): the United States of America (USA; n=7), Germany (n=6*), Canada (n=4), UK (n=4), Ireland (n=1), Belgium (n=1), France (n=1), Sweden (n=1*), Switzerland (n=1), Australia (n=1), Saudi Arabia (n=1), Egypt (n=1), and Tunisia (n=1). One study was conducted across two countries, as indicated by the asterisk (*).

A range of study designs were employed, including randomised control/crossover trials (n=7), non-randomised studies of interventions (n=7), cross-sectional surveys (n=7), cohort (n=4), qualitative (n=6), and mixed method studies (n=1).

Intervention studies generally comprised relatively small sample sizes, ranging from 7 to 56 participants (median: 27). Of these, the 6 randomised control trials had sample sizes ranging from 7 to 49 participants (median: 37). Survey and cohort studies were moderately sized on average, ranging from 27 to 2,805 participants (median: 294). Qualitative study sample sizes were varied, ranging from 5 to 116 participants (median: 25).

The break-related topics of investigation were also highly varied. Intervention studies investigated the effect of microbreaks (particularly in surgery), naps, yoga or exercise sessions, and standard 30-minute breaks. Surveys and cohort studies investigated a wide range of break-related topics, including: the impact of breaks on digital eye strain, reaction time, burnout, stress, affect, vehicle and work-related accidents, inappropriate prescribing, emotional exhaustion, work-home conflict, report errors and healthy eating behaviours. Qualitative methods were used to appraise break interventions as well as to investigate diverse topics such as the importance of breaks to new mothers' ability to continue breastfeeding following maternity leave, the potential of breaks to improve clinician wellbeing and fatigue, the culture surrounding breaks and clinician opinions on them. The single mixed method study investigated the role of breaks on 'sharing ignorance' (detecting and sharing unknown knowledge and learning from failures) and 'hiding ignorance' (deliberately preventing knowledge sharing).

Wellbeing and performance outcome measures were also dissimilar across all studies. Table 5 shows a list of outcome measures used in the quantitative studies included in the review and the corresponding number of studies that used each measure. They are grouped to provide an overview of the number of different tools used to measure similar constructs; however, some outcomes might measure more than one construct and therefore fit into multiple categories (e.g. the Patient Reported Outcomes Measurement Information System which measured anxiety, depression and sleep disturbances; Scheid et al., 2020).

Over 70 different quantitative outcome measures were used across the 25 quantitative studies. The most frequently used was the Maslach Burnout Inventory (MBI), which was used in 7 studies – although some authors used only one subscale of the 3 MBI dimensions (e.g. Nitzsche et al., 2017). The only other measures used in more

than one study were the Psychomotor Vigilance Task, the Perceived Stress Scale, the Five Facet Mindfulness Questionnaire, and heart rate which were all used in 2 studies respectively.

Table 5 Outcome measures used by quantitative studies included in the systematic review

Measure	No. of studies using measure
Accidents	
Driving simulation (StiSim Drive Simulation System)	1
Number of motor vehicle accidents	1
Number of work-related accidents	1
Attention and Cognition	
Test for Attentional Performance	1
Conner's Continuous Performance Test	1
Attentional failures - EEG	1
Psychomotor Vigilance Task	2
Probe Recall Memory Task	1
Star-shaped precision test (accuracy)	1
BP test of concentration and performance	1
Simple and complex reaction time (Brain Checkers software)	1
Burnout	
Maslach Burnout Inventory	7
Copenhagen Burnout Inventory	1
Stanford Professional Fulfilment Index	1
The Resilience Scale (RS-14)	1
Stress	
Perceived Stress Scale	2
Intraoperative stress (study-specific)	1
Self-rated stress (visual analogue scale)	1
Hospital Consultants' Job Stress and Satisfaction Questionnaire	1
Occupational stress (study specific)	1
Effort-Reward Imbalance questionnaire	1
Emotions and Affect	
Positive and Negative Affect Schedule	1
Self-rated empathy (study specific)	1
Jefferson Scale of Patient Perceptions of Physician Empathy	1
Self-rated confidence (study specific)	1
Intensity of positive and negative affect (MyDay app)	1

Measure	No. of studies using measure
Anxiety	
Stait Trait Anxiety Inventory	1
Depression Anxiety Stress Scale	1
Patient Reported Outcomes Measurement Information System (Anxiety, depression and sleep disturbances questions)	1
Fatigue and sleepiness	
Stanford Sleepiness Scale	1
Fatigue Severity Scale	1
Tiredness (study specific)	1
Karolinska Sleepiness Scale	1
Fatigue items from NASA Task Load Index (workload)	1
Fatigue reduction strategy checklist (study specific)	1
Sleep	
Sleep duration - EEG	1
Sleep duration & onset - EOG	1
Fitness tracker	1
Pittsburgh Sleep Quality Index	1
Job performance	
Departmental performance indicators	1
IV simulation (CathSim)	1
Patient outcomes (cardio monitoring, urine volume, blood gas parameters, body temp)	1
Mean operation time (surgery)	1
Team communication and co-ordination (study-specific)	1
Surg-TLX and GOAL questionnaire	1
Physical performance during surgical procedure (study specific)	1
Mental focus during surgical procedure (study specific)	1
Distractions and workflow interruptions	1
Individual work style (study specific)	1
Performance rating by assessors (Breaking bad news)	1
Opioid prescribing rates	1
Report errors	1
Mindfulness	
Five Facet Mindfulness Questionnaire	2

Measure	No. of studies using measure
Cardiovascular	
Blood pressure	1
Heart rate	2
ECG events (sudden increase in HR during stressful event)	1
Musculoskeletal	
Physical discomfort (study specific)	1
Muscular fatigue (2.5kg weight hold)	1
Musculoskeletal system and ophthalmologic strain/pain (neck, arms, spine, knees, eyes)	1
Adapted Nordic Musculoskeletal Questionnaire (pain)	1
Physiological	
Salivary cortisol, amylase, testosterone, DHEA	1
Other physical health measures	
Weight	1
Hypoglycemic symptom checklist	1
Food intake	1
Fluid intake	1
Urine output	1
Blood glucose	1
Digital eye strain symptoms	1
Other	
Survey Work-Home Interaction (Work-home and home-work conflict)	1
Study specific ratings or feedback on interventions	3
Barriers to healthy eating checklist (study specific)	1
Ignorance sharing (study specific)	1

The qualitative studies used a variety of methods including individual interviews, focus groups and qualitative surveys. Analysis techniques included thematic analysis (n=5), framework approach (n=1) and content analysis (n=1).

3.6 Impact of breaks on wellbeing and performance outcome measures

3.6.1 Quantitative study findings: Break interventions

Results for standard 30-minute breaks were mixed. In a German double-blind cross-over trial (Coburn et al., 2006) anaesthesiology trainees in the intervention phase had a 30-minute break in a recreation room (facilitated by an

additional anaesthetist), while participants continued working in the control phase. The researchers found no changes to attention, working memory, sleepiness or anxiety measured during the shift. An Australian before-and-after study (Mitra et al., 2008) investigated the effect of rota amendments to include provision of cover for doctors to take breaks. The intervention also included educational sessions and posters about the importance of taking breaks. The researchers found that facilitating cover almost doubled break-taking prevalence, significantly improved clinicians' tiredness and fatigue at the end of each shift as well as departmental performance indicators (time to see patients, triage and target admission times).

The two sleep-related intervention studies (Amin et al., 2012; Smith-Coggins et al., 2006) conducted in the US showed overall improvement to wellbeing and performance during both day and night shifts. Twenty-minute midday naps during medical trainees' day shifts were associated with improvements in cognitive functioning and attentional failures (Amin et al., 2012), while 40-minute naps for ED staff during night shifts showed improvement to reaction times, mood, sleepiness, and driving performance (Smith-Coggins et al., 2006). However, no significant changes were seen in memory and simulation of intravenous tasks.

Yoga and mindfulness interventions were investigated by two US before-and-after studies with obstetrics and gynaecology trainees (Babbar et al., 2019; Babbar et al., 2021) and two randomised control trials – one in Australian emergency medicine trainees (Ireland et al., 2017) and one in US faculty physicians (Scheid et al., 2020). The 1-hour sessions took place within work hours. Across all four studies researchers found overall positive improvements to wellbeing and performance measures such as burnout, anxiety, depression, stress, blood pressure, total and restful sleep, professional fulfilment, interpersonal disengagement, resilience, and mindfulness. However, no changes were seen in heart rate (Babbar et al., 2019), subjective sleep scores (Babbar et al., 2021), sleep disturbances and affect (Scheid et al., 2020). One study (Scheid et al., 2020) found that positive findings in burnout, stress, professional fulfilment, anxiety, and depression were not sustained at a two-month follow-up, and another (Babbar et al., 2019) found an overall increase in participants' weight following the implementation of a yoga programme.

To reduce the common musculoskeletal difficulties associated with prolonged surgery, the effect of microbreaks (breaks of approximately 5 minutes or less) was tested in surgeons in Canada, USA and Germany using parallel randomised control trials (Engelmann et al., 2012), randomised crossover trials (Dorion & Darveau, 2013; Engelmann et al., 2011) and before-and-after study (Hallbeck et al., 2017) designs. Results were predominantly positive. Five-minute microbreaks every 30 minutes saw improvements to musculoskeletal strain, cortisol, attention, concentration, doctors' responses to stressful intraoperative events, intraoperative and postoperative fatigue, and stress – without prolonging the duration of a given surgery nor affecting patient outcomes (Engelmann et al., 2011; Engelmann et al., 2012). However, doctors' approval of this scheme depended on their work style (Engelmann et al., 2012). Studies also tested microbreaks of a shorter duration (20-second pauses

every 20 minutes and 1.5-2 minute breaks every 20-40 minutes), and, despite the shorter break time, showed predominantly positive effects (Dorion & Darveau, 2013; Hallbeck et al., 2017). Twenty-second microbreaks showed improvements to physical discomfort, muscular fatigue, and accuracy (Dorion & Darveau, 2013), while breaks of 1.5-2 minutes showed improvement to musculoskeletal pain, physical performance and, for some surgeons, mental performance, with no or minimal effect on surgery duration, difficulty, complexity, distractions, work flow or mental/physical demands (Hallbeck et al., 2017). Additionally, the majority of surgeons wished to incorporate the short micropause into their regular routine (Hallbeck et al., 2017).

Other microbreak interventions included a Canadian study delivering microfood breaks (six small meals) throughout the work day (Lemaire et al., 2010) and a French study on 5-minute mindfulness meditations prior to breaking bad news to patients (Mengin et al., 2021). Microfood breaks were found to have positive effects on speed and accuracy, blood glucose levels, fluid intake, urine output, and caloric intake though no significant reduction in hypoglycemic nutrition-related symptoms (Lemaire et al., 2010). Five-minute mindfulness meditations had a positive effect on performance during a simulated bad-news consultation, however, it had no significant effect on doctors' stress, confidence, or self-perceived or patient-perceived empathy (Mengin et al., 2021).

3.6.2 Quantitative study findings: Survey and cohort studies

Survey studies investigated various topic areas and used a variety of measures to investigate the impact of break taking. A survey of radiologists in Saudi Arabia found that infrequent break taking was predictive of digital eye strain (Al Dandan et al., 2021), whilst in the UK (Winston et al., 2008) doctors reported lack of breaks as the most common barrier to healthy eating. Two studies, one in Egyptian medical trainees (Hassan et al., 2020) and another in German consultants (Kirkcaldy et al., 2002), found that fewer breaks correlated with, or were predictors of, higher stress levels. The latter survey (Kirkcaldy et al., 2002) also found that while shorter break duration was a predictor of work-related accidents, it was not a predictor of motor vehicle accident rates. A survey of German physicians in private practice (Nitzsche et al., 2017) found that break taking negatively correlated with work-home conflict and indirectly correlated with emotional exhaustion. However, a small survey of Tunisian anaesthetists of varying grades (Kalboussi et al., 2020) found no association between break-taking behaviours and levels of burnout. Additionally, one cross-national survey (Ohlander et al., 2015) showed break duration negatively correlated with doctors' work stress in Sweden but not in Germany.

Cohort studies were both prospective and retrospective in design and also reported on a variety of measures. One prospective cohort study in Belgian ED physicians (Bérastégui et al., 2020) found that greater use of fatigue reduction strategies (break activities) were associated with faster reaction times but not with levels of burnout. A UK study in trainees (Hockey et al., 2020) found that a lack of breaks during shifts was associated with greater negative affect (worry, tiredness, impatience, frustration etc.) and less positive affect (competence, enjoyment,

happiness etc.). A retrospective cohort study using secondary analysis of electronic records in the US (Neprash & Barnett, 2018) found that doctors were more likely to inappropriately prescribe opioids before than after a break, while another in Switzerland (Vosshenrich et al., 2021) showed that report errors (as a surrogate marker of fatigue) reduced after breaks, though this post-break effect waned as the week progressed.

3.6.3 Qualitative findings: Qualitative appraisals of break interventions

Two studies qualitatively appraised interventions. One (Lemaire et al., 2011) used individual interviews to follow-up the aforementioned Canadian microfood break study (Lemaire et al., 2010) and found that lack of time, access to break areas, and lack of food choices were barriers to adequate nutrition, which in turn impacted doctors' emotional and physical symptoms, their ability to work, and their interactions with colleagues and patients. However, the intervention created greater awareness of nutrition in the workplace and prompted doctors to change their habits and eat more regularly.

Another small qualitative study of an intervention (Lockhart et al., 2013) used a survey to appraise a weekly 1-hour intrawork exercise session for Canadian rheumatology fellows. Participants reported that work was a barrier to their desired exercise regime and felt the programme was an effective use of time and resources. The majority found that the program increased their confidence and, following the programme, the majority were continuing to exercise more regularly.

3.6.4 Qualitative findings: Other

Other qualitative studies used focus groups and individual interviews with doctors and thematically analysed discussions about various break-related topics with a wellbeing or performance component (Hall et al., 2018; Morrow et al., 2014; O'Shea et al., 2020; Walsh et al., 2005).

One (UK) focus group study investigated themes regarding breaks as a potential strategy to improve GP wellbeing (Hall et al., 2018): GPs described breaks as a valuable, desirable opportunity to remove oneself from the workplace that is a feasible wellbeing improvement strategy, though short coffee breaks were deemed more feasible than lunch breaks.

Another focus group study (O'Shea et al., 2020) investigated US ED doctors' thoughts about the function of breaks. Themes included doctors' need for breaks for cognitive and emotional functioning, however, when breaks were taken for the benefit of patients or productivity this was more acceptable than if they were taken for self-care alone. Doctors expressed the view that breaks had the potential to hinder work (though this had never personally been experienced before) and that taking them required flexibility and attuned organisational skills.

Additionally any culture change around doctors' break taking was thought to require 'buy-in' from colleagues and other staff.

A UK focus group study (Morrow et al., 2014) investigated the impact of Working Time Regulations on the experience of fatigue. Themes included fatigue being a threat to doctors' performance (e.g. efficiency and skills) and that this worsened with hunger or discomfort caused by missed breaks. Participants expressed the view that fatigue was still experienced despite the implementation of regulations, that rest areas were increasingly being reduced, and that senior staff seemed to lack awareness of trainee entitlements to rest.

Finally, a Canadian interview study (Walsh et al., 2005) with doctors who were also new mothers found that while they valued the ability to breastfeed, this was dependent on their ability to take breaks to express milk.

3.6.5 Mixed method findings

The only mixed method study included in the review (Wilkesmann, 2016) investigated the phenomenon of sharing ignorance and hiding ignorance. The qualitative component of the study (individual interviews) identified breaks as an opportunity to share and hide ignorance, while the quantitative survey showed that breaks significantly facilitated sharing, but not hiding, ignorance.

3.7 Risk of bias

The risk of bias in the included studies was predominantly high (see Tables 3-7). The risk of bias rating for all randomised studies was 'some concerns' (Table 6), while quasi-experimental studies ranged from 'moderate' to 'critical' (Table 7), with most studies being at critical risk of bias. This was predominantly due to inherent confounding, a lack of comparator or control groups, the use of subjective criteria and a lack of blinding to intervention status. No randomised or quasi-experimental studies had pre-published their protocols and/or analysis intentions.

Using the relevant JBI checklist, observational studies met 62% to 100% of applicable criteria (

Table 8); however, many of the questions posed by the checklists were not applicable due to the inherent design of these studies (two were retrospective) and a lack of control or comparison groups.

Cross-sectional designs met 50% to 100% of the relevant JBI criteria (Table 9). In the absence of a standardised, objective measure of break taking, it is not surprising that only two of seven (28.6%) studies (Kirkcaldy et al., 2002; Ohlander et al., 2015) used standard, valid, objective criteria for measurement of break-taking. In these studies break duration was measured in minutes where other studies dichotomously asked whether participants take breaks at work (“yes” or “no”) or used a non-validated Likert-type scale dividing break frequency or duration into categories. Additionally, these were the only cross-sectional studies that reported appropriate methods to deal with confounding, despite most studies identifying potential confounders.

Qualitative studies met between 50% and 90% of the JBI checklist criteria (Table 10). Only two of the seven (28.6%) qualitative studies (Hall et al., 2018; Lemaire et al., 2011) reported the cultural or theoretical position of the researcher, only one study (14.3%) (Hall et al., 2018) reported the philosophical perspective of the researcher, and one study (O’Shea et al., 2020) acknowledged the researcher’s potential influence on the data.

Table 6 Risk of bias assessments of randomised crossover/control studies

Author (year)	Bias due to randomization process	Bias from period and carryover effects	Bias due to deviations from intended interventions (effect of assignment to intervention)	Bias due to deviations from intended interventions (effect of adhering to intervention)	Bias due to missing outcome data	Bias in measurement of outcomes	Bias in selection of reported result	Overall risk of bias
Coburn (2006)	Low	Low	Low	Low	Low	Low	Some concerns	Some concerns
Dorion (2013)	Some concerns	Low	Some concerns	Some concerns	Low	Some concerns	Some concerns	Some concerns
Engelmann (2011)	Low	Some concerns	Low	Some concerns	Low	Low	Some concerns	Some concerns
Engelmann (2012)*	Low	-	Low	Some concerns	Low	Some concerns	Some concerns	Some concerns
Ireland (2017)	Some concerns	-	Low	Some concerns	Low	Low	Some concerns	Some concerns
Mengin (2021)	Some concerns	-	Low	Low	Low	Low	Some concerns	Some concerns
Smith-Coggins (2006)	Low	-	Low	Low	Low	Low	Some concerns	Some concerns

*Note: While Engelmann (2011) and Engelmann (2012) are reports of one research study and share some participants (doctor participants), Engelmann (2012) introduces a new group of participants (patients), data and methodology (parallel design) requiring a separate assessment of bias.

Table 7 Risk of bias assessments of quasi-experimental studies

Author (year)	Bias due to confounding	Bias in selection of participants	Bias in classification of interventions	Bias due to deviations from intended interventions	Bias due to missing data	Bias in measurement of outcomes	Bias in selection of reported results	Overall risk of bias
Amin (2012)	Critical	Low	Low	Low	Low	Low	Moderate	Critical
Babbar (2019, 2021)	Critical	Low	Low	Moderate	Low	Serious	Moderate	Critical
Hallbeck (2017)	Moderate	Low	Low	Low	Moderate	Low	Moderate	Moderate
Lemaire (2010)	Moderate	Low	Low	Low	Low	Low	Moderate	Moderate
Mitra (2008)	Serious	Critical	Low	Critical	Serious	Serious	Moderate	Critical
Scheid (2020)	Critical	Low	Low	Serious	Low	Serious	Moderate	Critical

Table 8 Risk of bias assessments of observational cohort studies

Author (year)	1. Were the two groups similar and recruited from the same population?	2. Were exposures measured similarly to assign people to both exposed and unexposed groups?	3. Was the exposure measured in a valid and reliable way?	4. Were confounding factors identified?	5. Were strategies to deal with confounding factors stated?	6. Were groups/ participants free of the outcome at the start of the study (or at the moment of exposure)?	7. Were the outcomes measured in a valid and reliable way?	8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?	9. Was follow up complete, and if not, were the reasons for loss to follow up described and explored?	10. Were strategies to address incomplete follow up utilized?	11. Was appropriate statistical analysis used?	% 'yes' answers
Berastegui (2020)	N/A	N/A	No	No	Yes	N/A	Yes	Yes	Unclear	Unclear	Yes	50.0
Hockey (2020)	N/A	N/A	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	100.0
Neprash (2018)	N/A	N/A	Yes	Yes	Yes	N/A	Yes	Yes	N/A	N/A	Yes	100.0
Vosshenrich (2021)	N/A	N/A	No	Yes	No	N/A	Yes	Yes	N/A	N/A	Yes	66.7
% 'yes' answers	N/A	N/A	50.0	75.0	75.0	N/A	100.0	100.0	50.0	50.0	100.0	

Note: Q1-Q2 not applicable as no included cohort studies included control/comparison groups. Q6 is not applicable as participants were not free of outcome prior to study commencement (e.g. prescribing rates, intensity of positive/negative affect, etc.). Q9-Q10 are not applicable to retrospective cohort studies.

Table 9 Risk of bias assessments for cross-sectional studies

Author (year)	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	% 'yes' answers
Al Dandan (2020)	Yes	Yes	No	No	Yes	No	Yes	Yes	62.5
Hassan .(2020)	Yes	Yes	No	No	No	No	Yes	Yes	50.0
Kalboussi (2020)	Yes	Yes	Unclear	Unclear	Yes	No	Yes	Unclear	50.0
Kirkcaldy (2002)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100.0
Nitszche (2017)	Yes	Yes	No	No	Yes	No	Yes	Yes	62.5
Ohlander (2015)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100.0
Winston (2008)	Yes	Yes	Unclear	No	Yes	No	No	Yes	50.0
% "yes" answers	100.0	100.0	28.6	28.6	85.7	28.6	85.7	85.7	

Table 10 Risk of bias assessments of qualitative studies

Author (year)	1. Is there congruity between the stated philosophical perspective and the research methodology?	2. Is there congruity between the research methodology and the research question or objectives?	3. Is there congruity between the research methodology and the methods used to collect data?	4. Is there congruity between the research methodology and the representation and analysis of data?	5. Is there congruity between the research methodology and the interpretation of results?	6. Is there a statement locating the researcher culturally or theoretically?	7. Is the influence of the researcher on the research, and vice versa, addressed?	8. Are participants and their voices, adequately represented?	9. Is the research ethical according to current criteria, for recent studies, and is there evidence of ethical approval by an appropriate body?	10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	% 'yes' answers
Hall (2018)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	90.0
Lemaire (2011)	Unclear	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	80.0
Lockhart (2013)	Unclear	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Unclear	Yes	50.0
Morrow (2014)	Unclear	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	70.0
O'Shea (2020)	Unclear	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	80.0
Walsh (2005)	Unclear	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	70.0
Wilkesmann (2016)	Unclear	Yes	Yes	Yes	Yes	No	No	Unclear	Unclear	Yes	50.0
% "yes" answers	14.3	100.0	100.0	100.0	100.0	28.6	14.3	71.4	71.4	100.0	

3.8 Discussion

The breadth of break-related topics show that efforts are being made to investigate break effectiveness in doctors. Overall, the existing quantitative and qualitative literature suggests a positive effect of break taking on a range of wellbeing and performance outcomes. Positive effects were seen in breaks of varying duration, from 20-second microbreaks every 20 minutes during surgery to 30-minute uninterrupted breaks and 1-hour exercise sessions. However, comparison of the data is hindered by a lack of consensus about which break-related topics and research questions should be prioritised, how these should be researched and measured, and what defines a break, alongside heterogeneity in study design, an overall moderate to high risk of bias, and relatively small sample sizes.

3.8.1 Defining and measuring breaks

As a construct, doctors' intrawork breaks lack an agreed definition and a standardised means of measurement. In intervention studies, breaks were inherently defined by the intervention or control activity (e.g. 20-minute nap opportunity, 5-minute microbreak, 1-hour yoga session, etc.).

Observational studies used a dichotomous 'yes/no' checkbox to assess whether breaks were taken, others measured the duration of breaks in minutes or divided break duration and frequency into Likert-type categories. There appears to be no consensus on what delineates a break (temporally, contextually, or behaviourally) and no means of objectively, reliably, and validly measuring it. This lack of agreement adds to the inherent heterogeneity on this topic and further prevents comparisons of data and conclusions about the effectiveness of breaks.

Given a lack of consensus about what delineates a break from work (e.g. lunch seminars providing a teaching alongside food), this review stipulated its own definition, which placed limits on the duration (1 hour), location (*intrawork*), and content or activities (i.e. no work) during breaks. This was essential to provide focus and inclusion criteria for the review.

Since the publication of the systematic review described above (O'Neill et al., 2022), a conceptual framework of work breaks has been proposed by Lyubykh et al. (2022) in their systematic review of break-taking evidence in knowledge workers. The authors proposed five features of work breaks: 1) initiators (including attitudes towards breaks and the ability to take them), 2) duration, 3) frequency, 4) activities (e.g. naps, social breaks, exercise), and 5) experiences (e.g. sense of wellbeing, detachment, relaxation). Although the two pieces of work were unaware of each other at the time of publication, the operational definition of 'breaks' used in this review includes two of the features

from the conceptual framework (duration and activities) and the other concepts (frequency, experiences, and initiators) were explored as potential outcomes.

Although Lyubykh et al. (2022) present a useful framework and starting point for conceptually understanding breaks, further work is required to understand the meaning given to intrawork breaks by doctors. This is because the population of interest to Lyubykh et al. was broad – ‘knowledge workers’ included any jobs which require specialised knowledge, primarily through formal education (e.g. accountants, scientists, engineers) – and, although this group could include doctors and healthcare workers, the work environment of a doctor differs greatly from that of an accountant. It would therefore be useful to apply and contrast this framework with data from doctors.

To provide a comprehensive overview of existing literature on the topic of break taking in doctors, this review aimed to be inclusive, rather than restrictive, regarding the wellbeing and performance outcome measures of interest. It was only necessary that outcomes be broadly representative of wellbeing and/or work performance. Despite this, however, the level of heterogeneity in outcome measures was unexpected and there were very few overlaps. This demonstrates a need for further work that defines and identifies the outcome measures that are most important to answering questions about the effectiveness of breaks in a population of doctors at an individual, organisational, and population level. This could build on recent research which sought to establish a core outcome set for measuring wellbeing in doctors (Baldwin, O'Neill, Sinclair, & Simons, 2021). Determining which outcomes are important to demonstrating effectiveness of breaks and break-related interventions would have important implications for national and local policy and decision making.

3.8.2 Research on standard breaks

Prior to, or alongside, research that explores the effects of novel break activities (e.g. mindfulness, exercise) on doctors’ wellbeing and performance, it is important to explore the effect of standard breaks as a baseline – namely, uninterrupted 20- to 30-minute breaks and short naps. These foundational break-taking topics are an important research need as they are (or should be) the type of break most likely to be taken by doctors at work as, for UK doctors, they are mandated by legislation. The Junior Doctor contract is applicable to trainee doctors and requires a 30-minute break for any shift lasting more than 5-hours, two 30-minute breaks for shifts over 9 hours and three for shifts over 12 hours. The UK Working Time Regulations (WTR) are applicable to all doctors and require a minimum 20-minute rest break after 6 hours of work. Though doctors can opt out of the WTR limits on work hours (and many do), it is not possible to opt out of the rest requirements.

Only two quantitative studies investigated the effectiveness of 30-minute breaks with mixed findings: An Australian before-and-after study (Mitra et al., 2008) showed positive effects on wellbeing and performance outcomes, though it was appraised as having a critical risk of bias. Conversely, a German randomised control trial (Coburn et al., 2006) showed no effect of 30-minute breaks, with some concerns regarding risk of bias. Further good-quality experimental research on the topic of uninterrupted 20-minute or 30-minute breaks is required to more conclusively demonstrate the effect of legislated breaks on wellbeing and/or work performance, particularly in UK contexts.

Both studies that investigated 30-minute breaks took place in natural work environments and facilitated the 30-minute breaks through the provision of cover for the doctors taking a break. This suggests that the accommodation of appropriate cover is an important facilitator to break taking. The Australian study (Mitra et al., 2008) enabled this without increasing staffing levels, by adjusting rotas and pairing doctors working together as each other's cover. Further underpinning research is required to explore the feasible means of facilitating uninterrupted breaks and overcoming common barriers to taking them.

Naps are another common topic of discussion for maintaining doctors' performance and wellbeing, particularly on nights and long shifts. However, only two US studies (Amin et al., 2012; Smith-Coggins et al., 2006) investigated the effect of naps lasting under an hour. The studies showed positive effects of 20-minute (Amin et al., 2012) and 40-minute (Smith-Coggins et al., 2006) nap opportunities on measures of wellbeing and performance. However, they were appraised as being at critical risk of bias or some concerns, respectively. Further good-quality experimental research is required on the effect of naps and potential means of facilitating them.

3.8.3 Quality of included studies

Overall, the quality of studies on break effectiveness was suboptimal. While sample sizes for survey and cohort studies were moderate, small samples were used in intervention studies and randomised control trials. The included experimental (and non-experimental) studies carry a moderate to severe risk of bias due to inherent confounding, a lack of blinding, and control groups. This is problematic as experimental designs would provide the best approximation of break effectiveness and causality. While the feasibility of blinded experiments in break-taking research is low and unlikely, there is scope to reduce confounding and introduce more randomised trials in this area.

Qualitative research provides an important, nuanced understanding of break phenomena, however, existing qualitative literature does not tend to locate researchers culturally, theoretically and philosophically, nor does it acknowledge the potential influence of the researcher on findings.

3.8.4 Implications for future research

The first study meeting inclusion criteria for the systematic review was published in 2002. This suggests break taking in doctors had not received attention until relatively recently. With changing work policies and regulations in that time (e.g. UK Junior Doctor Contract 2002 vs 2016) and a more recent focus on the wellbeing of healthcare professionals, research of this type is perhaps still in its infancy. Indeed in those studies that did *not* investigate an intervention quantitatively or qualitatively (survey, cohort, qualitative and mixed method design studies) breaks were not the main topic of investigation. Breaks were instead a secondary topic of investigation among a host of others. The exception was the qualitative US study by O'Shea et al. (2020) on breaks in ED. This demonstrates a need for further focused exploratory research on this topic.

With positive findings of quantitative research on varying break types and durations – from overwhelmingly positive findings on microbreaks during surgery to mixed findings for 30-minute breaks, future research is needed regarding the ideal (yet feasible) duration of breaks for wellbeing and performance. Additionally, with positive findings for break activity interventions such as yoga and mindfulness interventions, research should seek to compare the effect of different practices within breaks in order to maximise their effect on wellbeing (e.g. usual break practice vs mindfulness breaks).

3.8.5 Strengths and Limitations

As this is the first systematic review of break taking in doctors (at the time of writing), no limits were placed on study design and break topics, and outcome measures were broadly defined. This provides a comprehensive review of existing empirical evidence on the topic to date and therefore meets the exploratory aims of this project. However, the results of the review highlight the substantial heterogeneity in the types of intervention implemented and outcome measures used. This hinders the comparison of data, including subsets thereof, across studies and makes any quantitative synthesis potentially misleading. Definitive conclusions about effectiveness are therefore lacking in this review.

With no consensus on what constitutes a work break for a doctor, and in order to provide some focus to the review, a definition of 'breaks' was conceptualized and agreed among the primary author and co-authors prior to the inclusion and exclusion of eligible studies. This placed limits on time (maximum of 1 hour), location (within the workplace) and activity (no work). In reality doctors' 'breaks' might include reflective practice sessions or teachings and this review could therefore exclude studies examining such practice. This is only a limitation of the review if stakeholder engagement with doctors determines that they consider reflective practice a *rest* break. This

limitation could be addressed through more extensive engagement with doctors *prior* to the review process. Chapter 5 and Chapter 7 seek to explore doctors' views on breaks through qualitative exploration and discuss these concepts in further detail.

3.8.6 Conclusions

This chapter addresses the first research aim of the project by providing a comprehensive review of existing literature on break taking in doctors and whether it demonstrates the effectiveness of breaks to doctors' wellbeing and/or performance at work.

Given the heterogeneity in design, quality, research questions, and outcomes of existing studies, it is not possible to conclude with certainty whether intrawork breaks improve wellbeing and performance in doctors. The existing evidence suggests a positive trend and this aligns with existing research in industrial contexts (Tucker, 2003), despite contextual differences between industry and healthcare settings. However, an overall moderate to high risk of bias across studies means that the findings in doctors are potentially unreliable. To comprehensively understand the effectiveness of breaks for doctors, future research should aim to standardise the measurement and definition of breaks, utilise valid and reliable wellbeing and/or performance outcome measurements, and minimise confounding and bias to allow better generalisability of findings.

Evidence on breaks in doctors is lacking within UK contexts and, where it exists, it does not explore the effect of standard 20 or 30-minute breaks. Further good-quality experimental research is required that investigates the effect of standard break lengths on UK doctor wellbeing and/or work performance. However, there is also a need for precursory research with UK doctors that seeks to explore break-taking practices, perceptions, the factors that negatively or positively affect break taking, and what defines a meaningful break. This is important to identify feasible and effective areas for intervention in subsequent experimental research. Chapters 4-7 describe mixed method studies that seek to fill this gap in the evidence.

Chapter 4 Pre-Pandemic Surveys

The systematic review of empirical literature (Chapter 3) suggested that evidence on doctors' break taking was broadly lacking within UK contexts. The review recommended a need for good-quality experimental research on the effectiveness of breaks for wellbeing and/or job performance, preceded by exploratory research on the break-taking landscape of doctors in the UK. The remaining chapters of this thesis describe a series of mixed method studies that seek to address the latter evidence gap by exploring doctors' views and experiences of break taking and the common factors affecting their break-taking practice.

This chapter describes the results of a survey, administered prior to the Covid-19 pandemic outbreak, which investigated senior and junior doctors' break-taking practices and perceptions, as well as the common barriers to breaks and potential means of facilitating them within healthcare settings in south west England. .

4.1 Methods

To explore doctors break-taking practice at a group level, the common facilitators and barriers to break taking, and the perceived importance of breaks to doctors, a cross-sectional survey was undertaken with consultants and doctors in training ($N=250$) in three different NHS trusts in Hampshire: University Hospital Southampton (UHS) NHS Foundation Trust, Southern Health NHS Foundation Trust, and Solent NHS Trust.

Four questions were posed by the survey (Appendix I): 1) the self-perceived effect of breaks on doctors' wellbeing – breaks were rated as important to doctors' wellbeing, unimportant, or undecided as to the effect; 2) the prevalence or frequency of break taking in a normal working day – participants selected how often they were unable to take breaks on average; 3) hindrances to break taking – participants selected the factors they felt negatively impacted their break-taking ability and could add to the optional "other" category; and 4) possible facilitators for breaks – a list of factors that could potentially encourage breaks ranked as "more likely to encourage breaks", "less likely", or "no effect", as well as the option to add to the "other" category.

The survey was administered to doctors attending induction events, trainee teaching sessions, and various clinical team meetings at the three NHS trusts between 6 September 2019 and 5 February 2020. Upon arrival, attendees were given an explanation of the research and provided with participant packs. Attendees could opt to complete the survey in the 15 minutes prior to the session or engage in free time. Participant packs included a participant information sheet (Appendix E),

consent form (Appendix F), case report form (Appendix G), demographics data questionnaire (Appendix H) and the survey questions (Appendix I). Individuals who were interested in participating but unable to complete the survey in person were sent a link to an online version through the iSurvey platform. An electronic version of the participant information sheet was presented followed by the electronic consent form and a tick-box to confirm consent.

An ethics application for the broader mixed method study, which included the follow-up interviews described in Chapter 5, was approved by the University of Southampton Research Ethics Committee (ERGO number 49247). As the research was conducted among NHS staff during the context of a working day, approval was also obtained from the Health Research Authority (IRAS number 266831). To ensure participant confidentiality, all electronic data was pseudo-anonymised and the data spreadsheet and decryption file was password protected. Any hard copies of the data were stored in a secure filing cabinet in a limited-access office and demographic data were stored separately from survey answers.

4.1.1 Data analysis

Demographic and fixed response data were input into SPSS for descriptive analysis. Data are presented as relative frequencies of responses to each survey item. Data from optional, open-ended questions and textual comments were entered into NVivo12 and analysed for recurring categories and themes. Additional categories or considerations were extrapolated, along with their frequency of occurrence in the comments.

4.2 Results

4.2.1 Participant demographics

The sample comprised 250 doctors of all grades, with the majority (78%) recruited from University Hospital Southampton NHS Foundation Trust, 14% recruited from Solent NHS Trust, 4% from Southern Health NHS Foundation Trust, and 4% of participants completed the survey online. Table 11 shows the demographic data for the sample, alongside the NHS hospital and community health service (HCHS) workforce statistics at the time of the survey. Gender (48.8% women), ethnicity, and religious representation largely resembled national statistics.

The median age of participants was 31 years ($M=33.96$; $SD=9.5$) with the distribution (R: 23-65) skewed towards the mid-20s (Figure 6). Under-representation of over 45s is likely due to the over-representation of foundation year trainees and under-representation of consultants and specialty

and associate specialist (SAS) doctors in the sample. An adequately representative number of core and specialty trainees are present in the sample.

The majority of specialties are represented in the sample, though emergency medicine and psychiatry were over-represented compared with national data.

Table 11 Demographic characteristics of pre-pandemic survey sample alongside national statistics

		Total recruited n(%)	Proportion of total sample (%)	National statistics (%)
Gender¹				
	Female	122	48.8	45.0
	Male	128	51.2	55.0
Age²				
	24 and under	21	8.4	2.0
	25 to 34	126	50.4	33.4
	35 to 44	57	22.8	29.2
	45 to 54	30	12.0	22.4
	55 to 64	8	3.2	11.1
	65 and over	1	0.4	1.8
Ethnicity²				
	White	148	59.2	50.5
	Asian or Asian British	55	22.0	27.0
	Black or Black British	20	8.0	4.21
	Chinese	4	1.6	2.3
	Mixed	9	3.6	2.9
	Arab or Arab British	12	4.8	3.9
	Prefer not to say	2	0.8	-
Religion²				
	No religion	87	34.8	11.4
	Christian	94	37.6	23.5
	Buddhist	3	1.2	1.4
	Hindu	23	9.2	8.3
	Muslim	23	9.2	9.8
	Sikh	1	0.4	0.8
	Other (Shinto)	1	0.4	2.8
	Prefer not to say	11	4.4	29.3

		Total recruited n(%)	Proportion of total sample (%)	National statistics (%)
Grade ³				
	Foundation trainee	93	37.2	10.3
	Foundation year 3	1	0.4	-
	Core trainee	25	10.0	11.3
	Specialty trainee, registrar	62	24.8	27.2
	Specialty, associate specialist	10	4.0	7.9
	Consultant	58	23.2	41.9
	Other	1	0.4	0.7
Specialty ³				
	Anaesthetics and intensive care medicine	26	10.4	12.5
	Clinical oncology	11	4.4	1.1
	Dental	1	0.4	2.2
	Emergency medicine	30	12.0	6.5
	General medicine	72	28.8	27.1
	Obstetrics and gynaecology	5	2.0	5.4
	Paediatrics	9	3.6	7.6
	Pathology	5	2.0	3.7
	Psychiatry	43	17.2	7.9
	Radiology	2	0.8	4.0
	Surgery	46	18.4	21.2

1. NHS Digital, 2019a, 2. NHS Digital, 2019b, 3. NHS Digital, 2020a

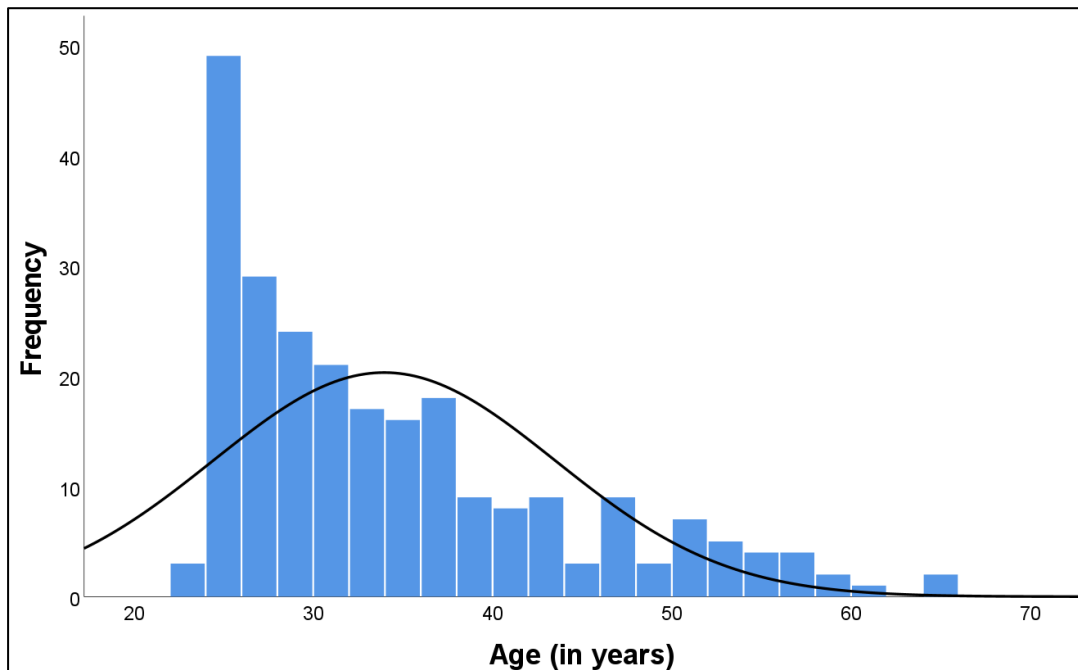


Figure 6 Distribution of age in the pre-pandemic survey data

4.2.2 Perceived importance of breaks

Most participants (92.4%) perceived breaks as important to their personal wellbeing, with a small minority disagreeing (1.2%) and the remainder (4.8%) undecided.

4.2.3 Frequency of missed breaks

For the interpretation of the frequency of missed breaks, the response options “daily” and “every second day” were combined in the descriptive analysis, due to their temporal similarity, as were the options “twice weekly” and “weekly”. Survey responses indicated a linear trend in frequency of missed breaks (see Figure 7), with the majority of participants missing their breaks daily or every second day (47.6%) or twice weekly or weekly (33.6%). A minority of the sample missed breaks only fortnightly (8.4%), monthly (4.0%), or never (3.6%).

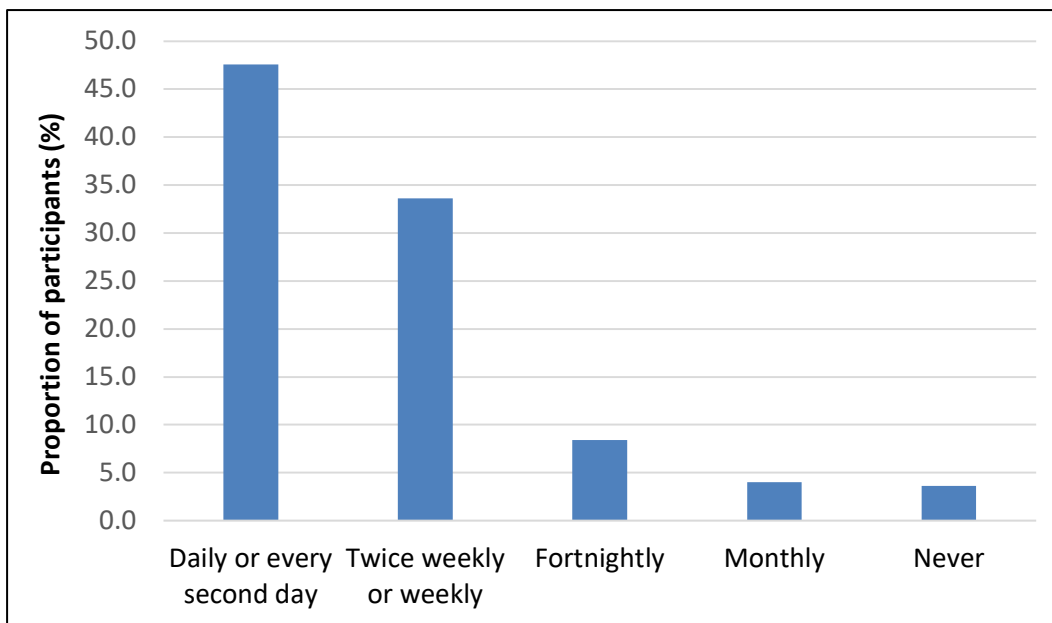


Figure 7 Frequency of missed breaks on average

4.2.4 Barriers to break taking

Figure 8 shows the sample’s ratings of a number of proposed (close-ended) barriers to break taking. Workload was the most frequently cited barrier (93.6%) to taking breaks. The next most frequently selected barrier was interruptions during breaks (79.6%) followed by staffing levels (74%) and pressure on oneself to keep working (67.6%). Breaks not being restful (52.4%), expectation from others to keep working (46.4%) and a lack of break facilities or infrastructure (34.8%) were the least common barriers to break taking.

Open-ended data responses yielded seven additional barriers to break taking, supplementary to those investigated by the closed questions. They are presented in order of their frequency of occurrence in participants' textual answers (Figure 9): 1) Ancillary work (meetings, ward rounds, administration, ineffective IT systems, and training requirements); 2) Break time is unprotected (breaks result in a later finish time); 3) Patient needs and severity (a feeling that complex patients and certain specialties require constant doctor presence); 4) Inappropriate referrals and lack of control over diary or scheduling; 5) Breaks are not valued or thought to be of benefit; 6) Breaks are not part of the profession's culture; 7) Lack of senior support for break taking; and 8) a sense of guilt about taking breaks.

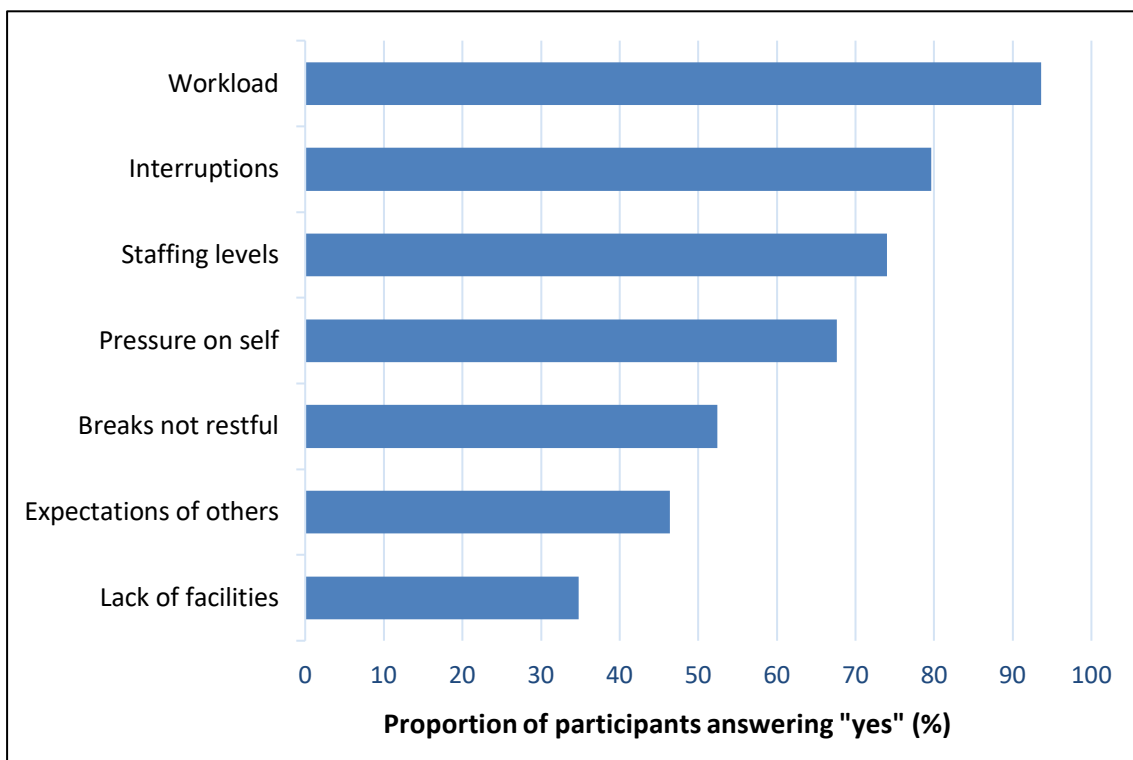


Figure 8 Ratings of close-ended barriers to break taking. Proportion of participants selecting factor as a barrier, or important barrier, to intrawork breaks.

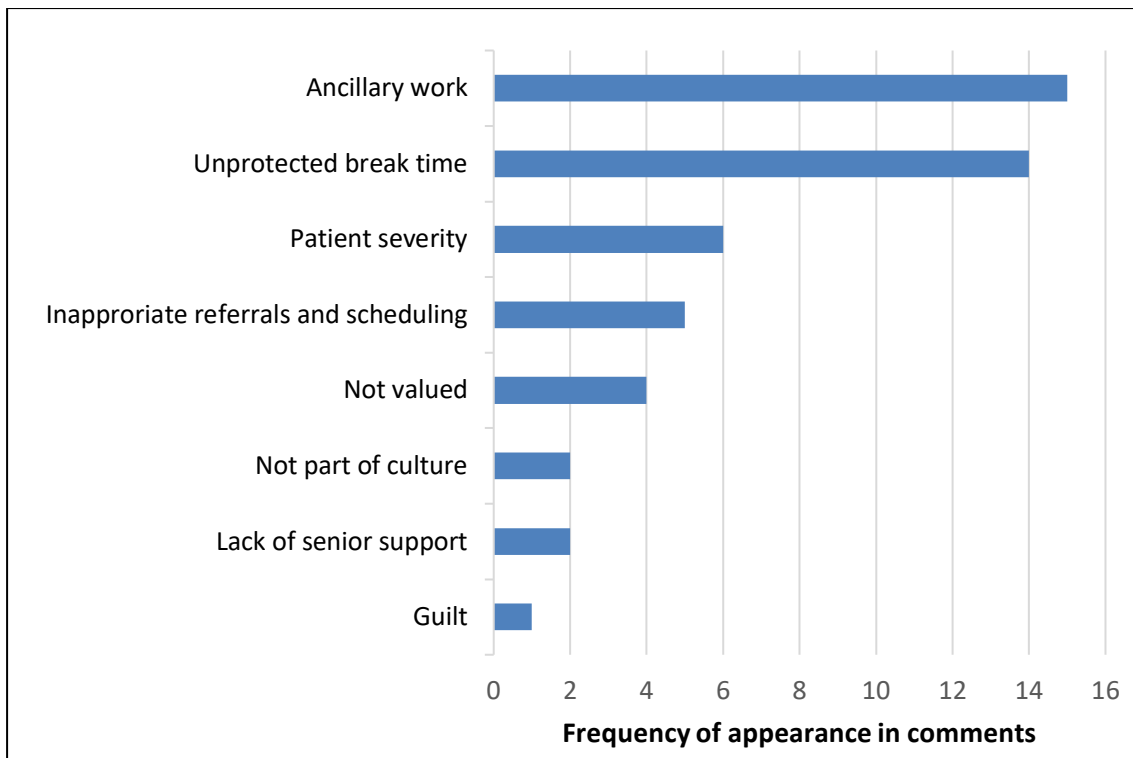


Figure 9 Additional barrier categories from free-text data

4.2.5 Facilitators of break taking

Figure 10 shows respondents' ratings of potential (close-ended) facilitators to break taking. Having adequate cover was rated the most likely facilitator to breaks (83.2%), followed by the delegation of some tasks to other staff (74.8%), senior encouragement (74.4%), handing over bleeps (70.0%), and making breaks mandatory (69.6%).

In the bottom half of the facilitator rankings, rest facility improvement was rated likely to help facilitate breaks for 60% of participants (31.6% felt it would make no difference to break frequency) – the same likelihood as team building to foster trust in team members' ability to cover tasks in participants' absence (more likely: 60%; no difference: 31.2%). The three least likely factors to facilitate breaks were: 1) campaigns and visible reminders of the importance of break taking (more likely: 27.6%, no difference: 59.2%); 2) knowledge of the effect of break-taking on patient outcomes (more likely: 42.4%; no difference: 48.8%); and 3) break activities such as mindfulness, therapy dog visits, or sensory pods (more likely: 50%; no difference: 36.4%). For the two lowest ranked factors, namely: reminders of break importance and knowledge of the effect on patient outcomes, a greater proportion of respondents indicated that they would make no difference to break-taking ability than the number of participants who indicated they would increase break-taking frequency.

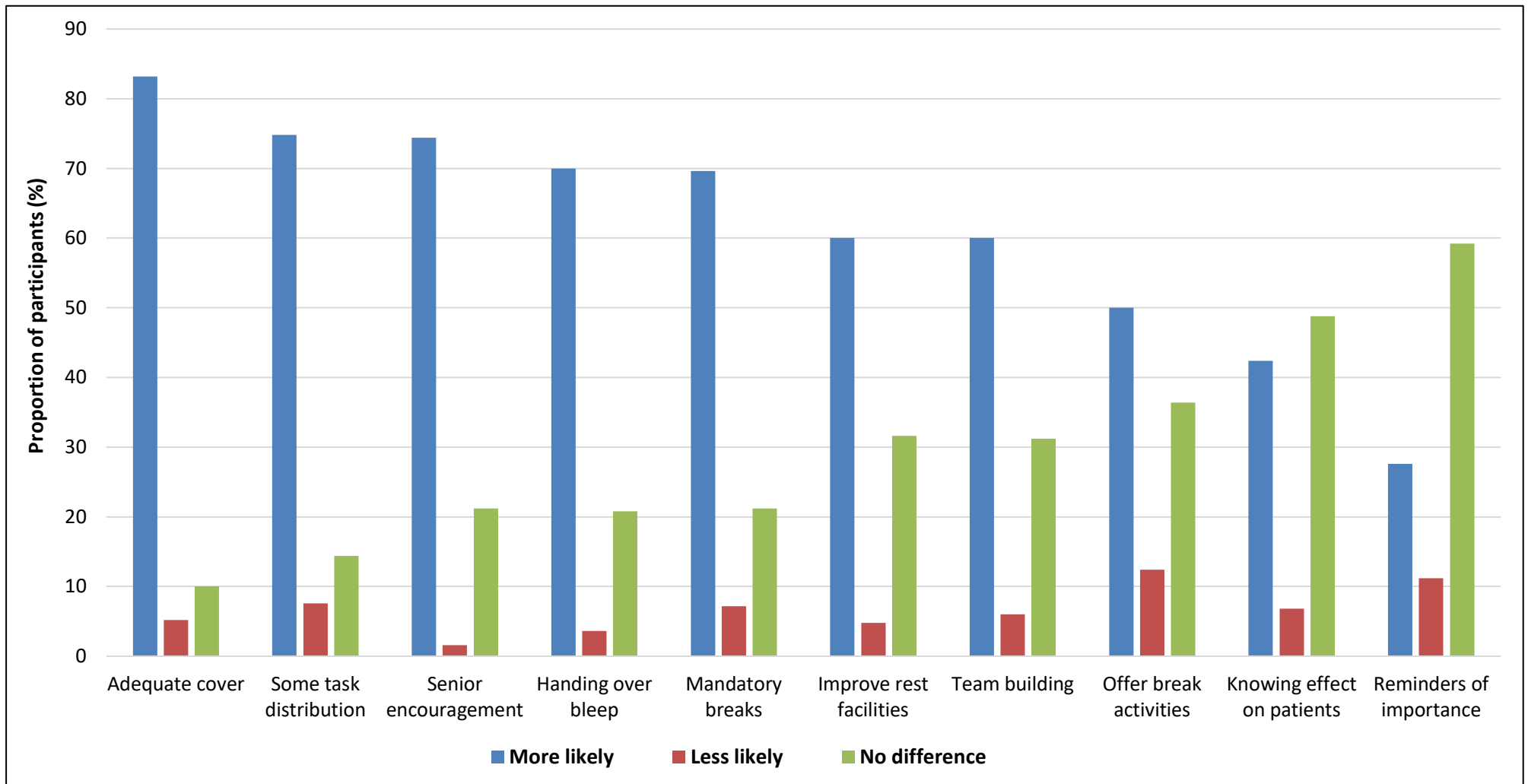


Figure 10 Pre-pandemic ratings of potential break facilitators. Proportion of participants rating the options as more likely, less likely, or no difference to break taking

Open-ended text responses yielded 10 additional factors to consider in attempts to improve break taking (Figure 11). These included, in order of frequency in textual responses: 1) Breaks and associated facilitators being applicable to junior doctors but not consultants; 2) other clinical staff and allied health professionals' (AHP) acknowledgement and acceptance of doctors' rest breaks; 3) the ability to fully escape professional responsibility by being inaccessible; 4) break activities would need to account for individual preference (e.g. exercise vs therapy dog); 5) ability to decide the timing of breaks; 6) uptake of break/distractor activities would be contingent on proximity to theatres/wards; 7) the notion of the whole team taking a break (together or separately); 8) having a meeting to delegate tasks to ensure these will be covered in their absence; 9) becoming better at prioritising own self-care; 10) a culture shift to accept breaks as part of the job.

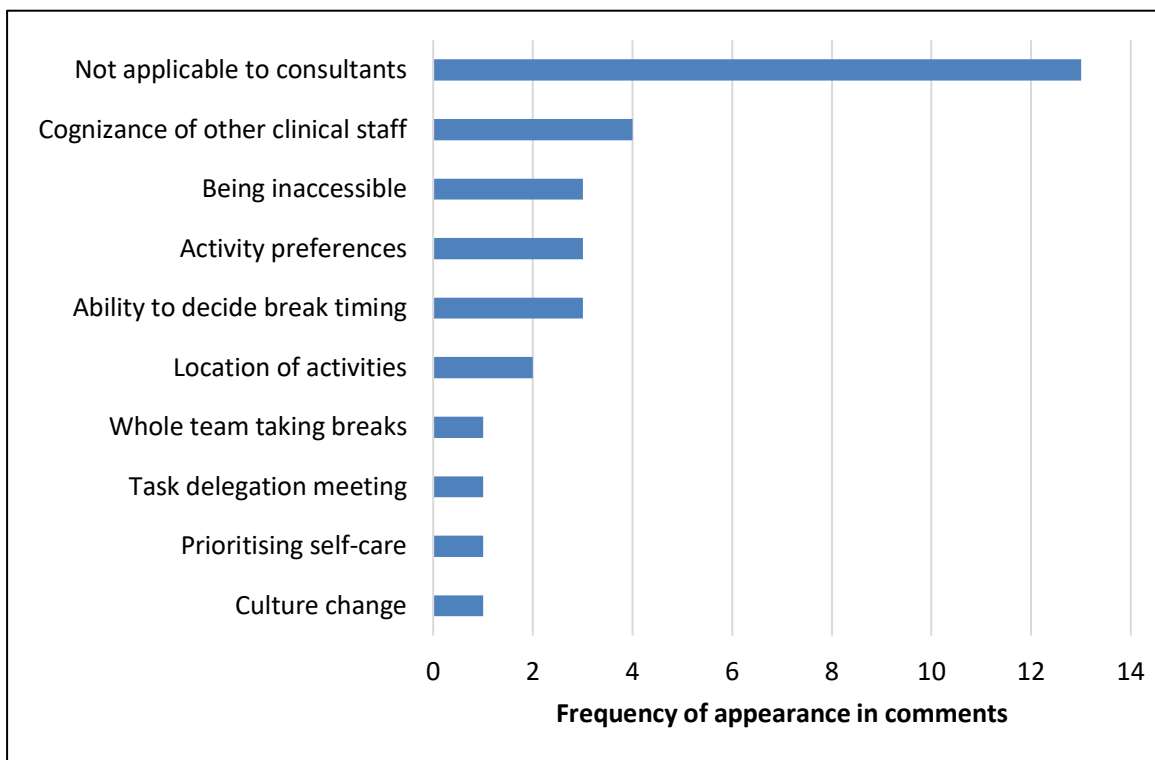


Figure 11 Additional facilitator categories from free-text data

4.3 Discussion

The survey data, collected from a sample of doctors of all grades in south west England, provide an indication of the perception of breaks, how often breaks were missed, the range of factors affecting whether doctors took their breaks, and an indication of the interventions most likely to improve break-taking frequency.

The vast majority of doctors surveyed (92.4%) perceived breaks as important to their wellbeing. However, only a small minority (3.6%) were taking breaks daily without issue. Most participants

missed their breaks on a daily or weekly basis (combined 81.2% of sample) with the rest of the sample missing their breaks only fortnightly, monthly, or never.

The reasons for infrequent breaks were varied, though the most commonly cited barrier to break taking was workload (93.6%), by a considerable margin, followed by interruptions during breaks and inadequate staffing levels. Similarly, the most common free-text comments regarding barriers to break taking described ancillary work such as administration and meetings. Unsurprisingly, therefore, the scenarios which would reduce or mitigate the impact of doctors' workload on break taking were the most frequently selected means of improving break-taking frequency: adequate staff cover and delegation of some tasks (e.g. administration) to other staff (such as administrators). These results are endorsed by those of the GMC's State of Medical Education and Practice report (GMC, 2019), published at the time of this survey, which found that 79% of doctors had at least occasionally been unable to cope with the workload in their jobs over the previous year. The National NHS Staff Survey (NHS England, 2019) that year also found that just under a third (32%) of respondents agreed that there were enough staff in the organisation to do their jobs properly, less than half the respondents (46%) felt able to meet the conflicting demands in their time at work, and more than half (56%) of staff were working 5 or more unpaid hours per week.

The survey results also indicate that workplace culture and beliefs about breaks are likely a significant factor in break practice. Having senior encouragement to take breaks was rated almost the same likelihood of improving break frequency (74.4%) as task delegation (74.8%). This also appears in the free-text comments, not only as a direct statement of need for culture change, but also in the fact that the most common free-text comment was from consultants stating that breaks are simply 'not applicable' to themselves and seniors. The comments that doubted the value of breaks, or questioned the purpose of a questionnaire about doctors taking breaks, were made by consultants only. As management beliefs and values are important to the predominant culture in a healthcare organisation (Carroll & Quijada, 2004), the seemingly widespread belief of seniors in the redundancy of breaks could partly explain the infrequency of break taking among all grades, and the widely accepted notion that breaks are not a normal or essential part of a doctor's workday. The findings also echo those of the GMC's Caring for Doctors Caring for Patients report (West & Coia, 2019), also published at the time of this survey, which found that culture and leadership had a significant bearing on doctors' wellbeing and there was widespread concern that the existing culture within NHS organisations was not adequately supporting the wellbeing needs of doctors.

The necessity for a culture change surrounding doctors' breaks was not only apparent among senior staff or near-peer colleagues, but also among other clinical staff and allied health professionals. Interruptions during breaks were the second most cited barrier to breaks in the sample (79.6%). The

second most common free-text barrier to breaks were the unprotected nature of doctors' breaks and the second most common free-text suggestion to improve the likelihood of breaks was other clinical staff's acceptance of doctors' break time, followed by a need to be fully inaccessible to queries during break time. It appears therefore that a culture change would not only need to target senior acceptance and behaviour, but also that of other staff.

At the time of this study, large financial investments had been pledged by the government to improve break facilities for doctors (Tonkin, 2019) and, over the course of the following year, this money was allocated or spent by trusts in England to upgrade Doctors' Mess areas or sleeping facilities (Tonkin, 2020). However, a lack of facilities was the least cited reason for missing breaks – it was selected as a barrier to breaks by only 34.8% of sample. When facility improvement (improving location or quality) was posed as a potential facilitator, it was ranked in the bottom 5 categories. Nevertheless, 60% of the sample felt it could make them more likely to take a break. It is possible, therefore, that the financial outlay might improve break-taking habits. However, the survey results suggest that better staffing (both like-for-like cover and administrative support) and a culture change among seniors and multidisciplinary colleagues would be better placed to improve break practices. The follow-up interviews in Chapter 5 explore these concepts in greater detail.

4.3.1 Strengths and limitations

The survey results described in this chapter achieve the second research aim of this project by quantitatively exploring UK doctors' break-taking practices, how often breaks are taken, and whether they are perceived as important.

The surveys also begin to address the third research aim of the project by investigating the factors most likely affecting doctors' break-taking practice. This was an important first step in understanding the current break-taking landscape. Instead of simply describing the problems facing doctors and their wellbeing, one of the aims of this project is to explore and identify potential areas for future interventions. As a result, the questionnaire not only addressed the common barriers which prevent break taking but also the factors which could facilitate better break-taking practices. These are explored in greater detail in the subsequent qualitative study (Chapter 5).

The data in this chapter have several limitations. It is based on a relatively small-scale observational survey with doctors from three NHS trusts in Hampshire in south west England. The sample comprised less consultants and SAS doctors than the national average and the psychiatry and emergency medicine specialties are over-represented. This limits the generalisability of the findings. However, the aims of the study were exploratory and the data was gathered to broadly understand the experiences of a sample of doctors' intrawork break taking and, where applicable, potential areas

for improvement. The data can be used to inform the design and investigation of interventions within a similar population. Interventions need to account for nuances within local settings and therefore benefit from this type of focused exploratory work.

An additional limitation of the data is that it is based on questions that were study-specific and based on retrospective recall using a Likert-type scale. The lack of validity and reliability data increases the potential for bias in the results. However, at the time of writing, there were no valid and reliable measures of, or relating to, the study's aims. As shown by the findings of the systematic review (Chapter 3), Likert-type scales or dichotomous yes/no answers are currently the most popular option for outcomes in observational research on doctors' break taking (71.4% of the cross-sectional studies included in the review). The questions were designed to provide a suitable level of detail within the invaluable, limited time doctors could afford to give within meetings and teaching sessions. The opportunities for free-text comments also allowed participants to provide any important information they felt was missing from the questions.

4.3.2 Conclusions

The results of the pre-pandemic scoping survey showed that doctors perceived breaks as important to their wellbeing. However, most doctors were missing their breaks on a daily or weekly basis. Workload, interruptions and staffing levels were cited as the most common barriers to taking breaks, while adequate cover, delegation of doctors' tasks, and senior encouragement were the most likely means of facilitating them. Doctors' experiences of break taking and the corresponding barriers and facilitators were explored in greater detail in the follow-up semi-structured interviews described in Chapter 5.

Chapter 5 Pre-Pandemic Interviews

The pre-pandemic survey with doctors (Chapter 4) showed that doctors perceived breaks as important to their wellbeing but they were often unable to take them. The survey data indicated that workload, interruptions and staffing levels were common barriers to break taking and that potential means of facilitating breaks included suitable cover, delegating some duties to other staff (e.g. administration) and encouragement from seniors to take breaks. This chapter describes a series of follow-up qualitative semi-structured interviews with a subset of the survey's junior and SAS doctor participants to explore these concepts in greater depth as well as any other factors and nuances that affect junior and SAS doctors' break-taking practices and environments. It also explores the interventions that could positively impact break taking in greater detail.

5.1 Methods

Pre-pandemic survey participants who a) consented to be contacted again and b) provided valid contact details were invited to take part in semi-structured interviews. The interviews explored participants' current break-taking practices, their views on breaks, as well as potential future-oriented solutions. To ensure the data captured a broad range of experiences, a maximum variation purposeful sampling method was intended (Palinkas et al., 2015). Initially a subset of eligible participants were contacted to ensure a range of grades, specialities, and ethnic backgrounds were included in the interview data. Following this initial purposive approach, all eligible participants were offered the opportunity to participate.

Interviews ranged in length from between 30 to 55 minutes, taking place between 21 February 2020 and 31 March 2020. Interviews ($N=9$) were initially conducted face to face in a private room at Southampton General Hospital or, if the participant worked in a community setting, in individual doctors' offices. However, the remaining interviews ($N=12$) – in the 'early pandemic' phase (see section 2.5.3.1) – coincided with the beginning of the Covid-19 pandemic outbreak and the first national lockdown, when hospital access was restricted to essential, clinical work. Face-to-face interviews were not possible and interviews were therefore conducted remotely via telephone. For those participants who were interviewed under pandemic conditions, the interviewer discussed pre-pandemic circumstances separately from the early effects of Covid-19 on their break-taking and work practices. Data presented in this chapter relate to break taking under typical, pre-pandemic conditions. Data regarding the early effects of the Covid-19 outbreak are presented in Chapter 7 alongside interviews undertaken with a cohort of foundation doctors one year after the outbreak.

Before interviews, participants were given a participant information sheet (Appendix K) and completed a consent form (Appendix L), either in person for face-to-face interviews or electronically for telephone interviews. All interviews were recorded for transcription purposes. The interview topic guide (Appendix M) served as a guide to the interview content. Therefore not all questions were necessarily asked or elaborated upon in a given interview – the conversation was ultimately steered by participants and their experiences. Each interview began with a broad, opening question to build rapport and encourage easy conversation. At the end of the interview participants were compensated for their time with a £10 Amazon voucher.

5.1.1 Participant demographics

The final sample consisted of 21 junior and SAS doctors representing a variety of grades, specialties, and ethnicities (Table 12). Although the survey sample comprised nearly 50% male and 50% female participants, those who volunteered for follow-up interviews were predominantly female (71.4%). The age range of participants was 24 to 41, with a median age of 28. Foundation trainees comprised nearly half of the sample, registrars approximately a quarter, core trainees approximately a fifth, and SAS doctors approximately a tenth. No consultants were recruited to the interviews.

5.1.2 Data analysis

Following transcription, the data were coded for themes in NVivo 12 using inductive thematic analysis (see section 2.5.3.2) to identify key themes relating to break barriers and incentives. Themes and sub-themes are presented. Samples of extracts are presented interchangeably as standalone excerpts and as embellishments to the narrative to illustrate my interpretation of the data. To protect participant confidentiality while providing some contextual data, participant's numeral identification numbers are provided along with their level of seniority – Foundation (FY), Registrar, Core, or SAS.

Table 12 Demographic characteristics of pre-pandemic interview participants

		Participants n (%)
Gender		
	Female	15 (71.4)
	Male	6 (28.6)
Age		
	24 and under	2 (9.5)
	25 to 29	12 (57.1)
	30 to 34	2 (9.5)
	35 to 39	4 (19.0)
	40 and over	1 (4.8)
Ethnicity		
	White	15 (71.4)
	Asian or Asian British	3 (14.3)
	Chinese	2 (9.5)
	Mixed	1 (4.8)
Religion		
	No religion	8 (38.1)
	Christian	8 (38.1)
	Hindu	2 (9.5)
	Prefer not to say	3 (14.3)
Grade		
	Foundation trainee	10 (47.6)
	Core trainee	4 (19.0)
	Specialty trainee, registrar	5 (23.8)
	Specialty, associate specialist	2 (9.5)
Specialty		
	Emergency	5 (23.8)
	Psychiatry	5 (23.8)
	Surgery	3 (14.3)
	Trauma and orthopaedics	1 (4.8)
	ENT	1 (4.8)
	General Practice	1 (4.8)
	Haematology	2 (9.5)
	Oncology	1 (4.8)
	Geriatrics	1 (4.8)
	Cardiology	1 (4.8)

5.2 Results: Factors affecting doctors' break-taking practice

It is not surprising that survey findings on break-taking frequency were echoed in participants' dialogue, such as the inevitable lack of breaks. However, the most common response to questions regarding break taking was *'it depends'* (2045-FY) and *'it's really variable'* (2010-FY). The interviews were therefore instrumental to uncovering nuances missed by the survey, and it was clear from the interview data that break-taking practice is determined by many, often intersecting, factors.

While it should be acknowledged that the data can be conceptualised in different ways, dependent not only on ontological or epistemological standpoints but also the viewpoint of the analyst (see section 2.8) my line-by-line thematic analysis produced three overarching factors which affect break-taking practices:

1. Organisational structures and context
2. Organisational and team-level processes
3. Individual preferences and characteristics

These themes are depicted in Figure 12. The cyclical figure illustrates that the factors are not distinct entities but interrelated such that they influence, and are influenced, by each other. Due to this relationship, many sub-themes span one or two other thematic categories but are presented as separate entities for clarity.

5.2.1 Structures and contexts

Doctors' intrawork breaks take place within the context of broader organisational structures and settings and participants described certain settings as more conducive to break taking than others. With almost half the sample of interviewees ($N=10$) being foundation doctors (the 'junior juniors') who rotate among specialties, locations, trusts and settings every 4 months, as well as participants of various ethnic backgrounds and nationalities, interviewees were able to speak to a breadth of experience. This meant that each participant, whether foundation level or higher, were able to compare their current experiences against those of other specialties and contexts.

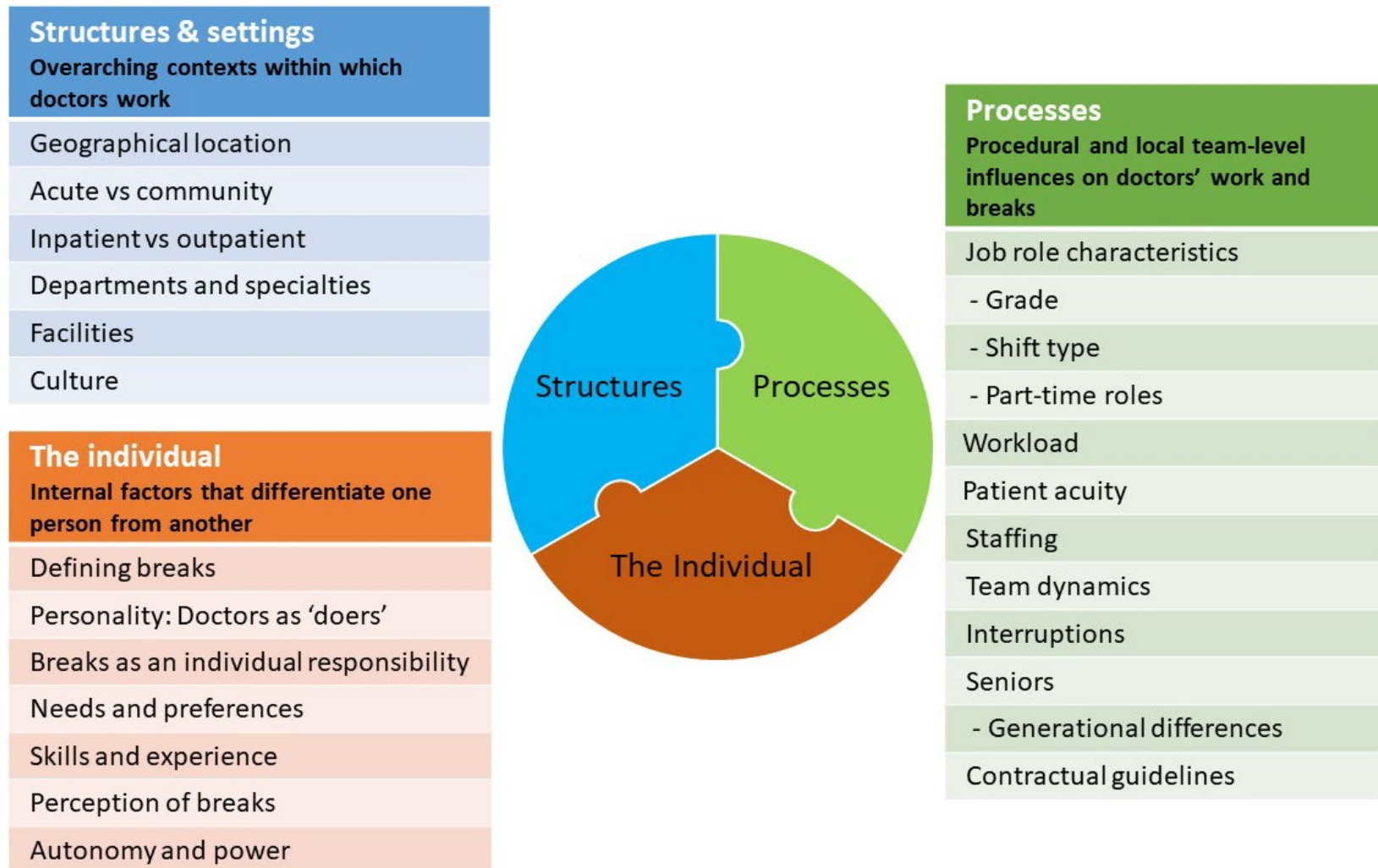


Figure 12 Pre-pandemic interview themes: Factors affecting break taking

5.2.1.1 Geographical location

Participants spoke of how trusts and geographical locations differ in fundamental ways, even within one region. Hospitals within a given trust could also differ from each other. Among many others, these differences included the various types of settings or health services (acute vs community, inpatient vs outpatient, specialties and departments); resources and facilities; services and support; and protocols and trust policies, which could affect workplace experiences, including work hours: *“Southampton full-time is more work than Portsmouth or Poole or Salisbury or Dorchester. So part-time at Southampton is like full-time somewhere else.”* (2143-Registrar)

Some participants also described differences in the ways people integrated and the culture. Comparing different hospitals in the UK, a participant explained *“The people over there, either they're too busy or, you know...but it is pretty friendly here... I like the work culture here. I think it's a very friendly hospital.”* (2115-SAS). These factors are likely to have an impact on the way in which breaks are perceived or taken in different trusts.

5.2.1.2 Acute vs community

Participants often described inherent differences between acute and community settings, explaining that *“[community] placement is much more relaxed than in a hospital environment”* (2004-Foundation). In acute placements *“you are providing a service to a bunch of people in a specific hospital... Whenever you are there in the office, in that hospital, you're sort of on duty because you're there. And then I think it's quite constant... And when you leave...somebody else on the team will pick up because it's a 24-hour service.”* (3022-Core).

It also affected other aspects like senior presence and the necessity for it: *“In this [acute] job...I probably clap eyes on a consultant every day...That's probably necessary given the pace... If you've made a decision at 9am it's no longer valid by 2pm... Whereas I think in community jobs...I'd see my consultants once a week...and catch up... That was fine.”* (3022-Core)

With the increased flexibility, autonomy, and slower pace of community work, participants explained they could *“get a protected lunch time of at least half an hour... And there's quite a high rate of [patients] not attending appointments...so extra tea breaks and stuff.”* (4009-Registrar)

5.2.1.3 Inpatient vs outpatient

Within a given acute or community setting, inpatient and outpatient work inherently differs, *“the intensity is a little bit different”* (3022-Core). In outpatient work *“you can control the amounts of appointments and...the DNA rate is really high. People just often don't turn up. You use the gap to do*

other things." (2004-FY) With the slower pace and flexibility of outpatient work, participants explained that *"you can take a 15 minute break, and you can all schedule to have that together [as a team]."* (2004-FY)

5.2.1.4 Departments and specialties

Within acute, community, inpatient or outpatient settings, participants also described how specialties and departments differed from each other in many ways, including patient acuity, the need to remain accessible, the presence or support of seniors, break or wellbeing culture, the types of shifts worked, the need for bleeps, and the available facilities. These concepts are described further in the sections that follow.

5.2.1.5 Facilities

Although the survey results showed that other factors (such as workload and staffing) were more likely to hinder breaks, for some participants, when they had the opportunity, *"the biggest barrier I found to taking a break is the lack of somewhere to do that."* (2043-FY) The increasing disappearance of break facilities to make way for work spaces meant, *"there's now no communal break space so everyone tends to just have lunch by themselves."* (2004-FY)

Some specialties or departments had greater access to facilities than others, *"I probably took more breaks properly on Geriatrics because we had a big geriatrics doctors' office that we'd all sit in... And jobs like surgery just don't have office space in the same way."* (2043-FY) Additionally, the proximity of work spaces to break areas affected the likelihood of attending them. For example, *"where A&E is placed, by the time you've actually tidied things up, wombled off for your break, got to the place, got through the queue, picked up your food, come back, you've probably got 10 minutes to eat it. It's not ever worth it."* (1003-Registrar) Opening hours were also an important determinant of use, particularly when working outside of normal daytime working hours, as *"you never know when you're going to get a break and often it's when the canteen has shut or is not available."* (2190-Registrar)

Participants also explained that the quality of facilities could be a barrier. Describing the doctors' mess in their Hospital, a participant said *"it's dark, it smells, it's really disgustingly dirty, so I don't want to eat in there."* (2043-FY) Participants also noted how amenities within break facilities are important: *"There's no phone signal down there and there's bad Wi-Fi so actually you feel like you can't be there for too long because people wouldn't necessarily be able to contact you if they did need you."* (2004-FY)

Outdoor areas also facilitated or hindered active breaks. For example *“Poole Hospital [is] right next to a really awesome park and generally people would try and get out and go for a walk around that park, but Southampton doesn’t really have anything other than a cemetery.”* (2090-Registrar)

5.2.1.6 Culture

A slightly more intangible contextual element that had a bearing on break-taking practice is the broader culture surrounding staff wellbeing. This could be a function of the profession (doctors compared with other professions) – *“I think that for medics [protected breaks] would feel quite alien because it's not something that we ever routinely do.”* (3022-Core) – or the larger organisational setting (different trusts and hospitals) and/or geographical location (see 5.2.1.1). Culture could also differ on a smaller scale among specialties or teams. Many specialties were described as having a task-oriented atmosphere with a focus on task completion in favour of rest or staff wellbeing:

“The fellows...didn't consider themselves to have a finish time. And I think they then didn't expect us to have one either... The senior junior doctors in [the specialty] are just ridiculously motivated. And they love their job. So they do it and that is their life. Full stop.” (2004-FY)

In some specialties and teams, participants noticed that staff wellbeing was prioritised instead:

“The emergency medical profession is really open to the ideas of change and to supporting the trainees... We're all trying to look to improve the job because we know the job is unpredictable and challenging and at times bloody stressful. And it's all about making it more sustainable, preventing burnout at the end of the day, and preventing us from just leaving.” (1003-Registrar)

The broader wellbeing culture affected perceptions of breaks and their importance. In some specialties, breaks were *“rare. It's just the culture. Everyone just powers through.”* (2045-FY) Others recognised their importance. For example, *“As emergency medicine...we recognize the importance of [breaks]. You need to feed, you need to water, you need to just stop for five minutes.”* (1003-Registrar)

A team or specialty’s recognition of the importance of breaks often related to the mental load of a role, particularly in specialties with greater patient acuity.

“Because if you are not comfortable, if you are not alert, if you are not in a good stamina, if you are not well hydrated, well fed, you will not be acting optimally. So many colleagues remind me ‘please go have your lunch.’” (2179-Core)

“In the emergency department, we're always thinking... We actually have to assess the patient and we need to know what's next, so being alert and well fed is important in that context. But on the wards...a lot of my work as one of the more junior doctors is just paperwork really and that doesn't necessarily need full brain power.” (2064-FY)

“The risks of that [surgical] procedure are very, very high...so I think being hydrated and fed is, in that situation, important.” (2130-Registrar)

In other specialties, the prioritisation of breaks related to the emotional load of the work. For example, in psychiatry:

“There is much more of a culture of you need a break... You can't quite work on 'autopilot', in inverted commas, like you can in medicine and surgery.” (2004-FY)

“You have to contain the anxieties of not only the patients and their relatives, but also the medical team treating the patients. So it's really, really draining... You have to be comfortable holding on to the risk of the patient doing something unpredictable, they might hurt themselves or someone else. And it takes quite a toll on the doctor.” (4006-Core)

5.2.2 Processes and the team

While organisational and structural factors have a broader contextual effect on breaks, participants also described more local team-level factors and procedural aspects of their job that affect break-taking practice.

5.2.2.1 Job role characteristics

Each role has distinct characteristics. This can include the level of seniority, the type and duration of shifts, whether the role is part-time or full-time, and the length of time a doctor is placed in the job (e.g. FY doctor 4-monthly rotations).

5.2.2.1.1 Grade

Participants explained that a doctor's grade or seniority can affect their level of autonomy for break taking. Juniors can often feel they are at the mercy of their seniors for their breaks, particularly in roles with ward rounds where *“it's dependant on whether the consultant wants to take it. I mean obviously you can ask but I'd say it's not very common for us, especially for us as F1s, to be like 'Can we take a break?' No one does that. It's very much when the reg or the consultant decides, 'yeah let's have a break'.” (2032-FY)* This was also true for more senior trainees who *“can't always go when you want to because sometimes you have to hand over and be relieved in order to go.” (2143-Registrar)*

5.2.2.1.2 Shift type

There are various types of shifts that a doctor can be allocated in the rota system, which are particularly variable for trainees. Shifts vary in length, timing and frequency and are largely determined by the specialty a doctor is working in. For example, *“liaison psychiatry...is quite different to the typical foundation doctor experience. It's 9 to 5 Monday to Friday... [In] my Medical jobs the rotas varied depending on what you are doing but they often start a bit later and end a bit later... And you'd have Nights, or Twilights, and weekends.”* (2043-FY)

Participants explained that the type of shift, or time of day, had a significant bearing on the structure of the day, workload, and staffing, which in turn affected break-taking practice. They explained *“on weekends or late shifts or Nights...on the whole you are sort of fire-fighting.”* (2043-FY) Because these shifts tend to have fewer (or no) ward rounds and are less structured, *“sometimes you can get slightly longer breaks or sometimes no break at all. It's really variable.”* (2010-FY) Staffing levels also changed out-of-hours and for junior trainees *“the SHO and the registrar are both pretty much in theatre all night, so you are covering 200 surgical patients as the only doctor.”* (2043-FY) and therefore *“there were definitely shifts where I didn't drink water for a whole shift... [or] it would get to 4 o'clock in the morning and I haven't even sat down.”* (2043-FY) Senior trainees also had greater difficulty taking breaks on out-of-hours shifts because *“you go from during the day, there's lots of you in charge, to being the only one”* (2143-Registrar) and therefore often *“on a night shift...I cannot leave the department to go down to Costa to get a coffee, I have to have someone go for me.”* (1003-Registrar)

In addition to the standard shift types like Night shifts, daytime shifts, Twilight shifts, and long 12-hour shifts, certain specialties, departments or units have unique shift patterns, which could also dictate workload and pacing and affect break practices. In surgery, for example, once every 10 weeks each registrar is alternated onto the ‘hot week’ where *“you have the on-call mobile, you do the ward round and you troubleshoot any problems on the ward, take all the new referrals and try and sort out all the emergency theatres... Your lunchtime is not protected... You have to be opportunistic with the lunch. So you're eating and you just have to deal with the emergencies.”* (2141-SAS)

5.2.2.1.3 Part-time roles

Workload and staffing has a particularly pronounced effect on those working part-time. While full-time roles inevitably involve a high enough workload and doctors fairly regularly finish their shifts late, participants in part-time roles explained that they would often have a similar amount of work as full-time roles, however, *“they crammed it all in”* (3035-Core) to less hours. A participant who reduced their working hours to 60% explained *“in reality I do 100% of hours... But I know if I went*

back to even 80 percent, it becomes full time. Because it's full time plus another 25 percent." (3035-Core) The participant described a uniquely 'part-timer' sense of guilt attached to working like this because *"I had this conscious feeling that if I didn't do it, there's a patient at the end of that who's not getting what they need for another five days."* Additionally, they explained that opportunities for breaks in part-time roles can be particularly affected by the close links to staffing and workload because *"when my boss went away...for two weeks, I was covering all of her patients and all of her work... And where I'm part-time, that's building up on [days] I'm not there. So I'd come in, have all of mine, all of hers, and all of the backlog."* (3035-Core)

5.2.2.2 Workload

Workload was rated the most common barrier to breaks in the survey and interview participants described the significant effect it had on their ability to take breaks – as workload varies, so too does break practice. They explained that workload is affected by different aspects of a doctor's role, including patient acuity in the doctor's specialty (discussed in 5.2.2.3 below), the time of year, shift type, trainee status, and whether the role is full or part time. Overall, however, participants explained that *"more often than not, demand vastly outstrips the resources of the department."* (1003-Registrar). It was not only a steady stream of work but also *"when you have a big workload and then something urgent happens, you're like, 'I really need to do this now', but all these things are piling up."* (2004-FY) The accumulation of tasks and priorities meant that most doctors worked beyond contracted hours and subsequently affected their prioritisation of breaks.

Workload affected break duration *"one day can be quiet and you can have time to have a coffee with colleagues...and some days you just don't have any lunch break."* (2141-SAS); timing *"workload could prevent you taking a break when you want to and you might be able to take one two hours later."* (2043-FY); or the option of taking it with others *"[a colleague] suggested that we should be meeting at 1pm having our lunch together...but I didn't...mainly because I don't consistently have a chance to get a break at 1."* (2179-Core)

Workload not only varies *between* days, but also *within* a given day. Most participants found that due to the inherent variability in a doctor's workload, breaks are unavoidably taken on an opportunistic basis, explaining that *"you just do work and just have to fit your lunch in somewhere in between your work. It's just the nature of the job really."* (2141-SAS)

5.2.2.3 Patient acuity

Many participants explained that it was not only the quantity but the 'intensity' or urgency of patients' presenting problems that affected break practices, and this differed between specialties or wards. They explained that wards could be categorised into 'hot' or 'cold' and this affected break

frequency, duration, timing, and whether breaks can be taken with colleagues or away from the work space. For example, *“haematology is quite a cold ward... We don't have patients that deteriorate so fast. It is not emergency, it is not intensive care [where] you cannot expect how patients will behave, how the patient's condition will be, because they are critically ill. In haematology patients are quite chronically ill, not critically ill. So...I have had the chance to have a break.”* (2179-Core) Similarly, *“geriatrics was really civilized because we used to have a coffee on the ward at about 11:00.... We would gather around in the tiny kitchen and have a coffee and a chat.”* (4009-Registrar) and *“things were very different in GP because we all had lunch together at one time.”* (2068-FY)

Conversely, surgery was described as a comparatively ‘hot’ specialty where, *“you're eating and...they say, ‘You need to come and see the patient now because patient's now deteriorating. They're unconscious now so you have to come in quickly.’ You have to drop everything and just go and do it.”* (2141-SAS) Comparing medical and surgical placements a participant explained, *“[In medicine] I would get a lunch break in the office. I might decide that I'm going to request my blood tests during that lunch break to mean that I'm not backed up at the end of the day but I would get time to take a break usually... I very, very rarely took any breaks at all on my surgical job... I would grab my lunch, but I wouldn't generally have time to sit around because there were lots of unwell patients and it was a busy job.”* (2043-FY)

Given the impact of acuity, one might assume that break taking in emergency medicine or the acute medical unit (AMU) would be equally difficult. However, despite the apparent urgency of presenting problems, many participants commented that *“interestingly, in the emergency department...it's easier to take a break.”* (2064-FY) The same was true of AMU where *“they're really, really good about you taking your breaks. And everyone really looks out for each other.”* (2032-FY) The reasons given for this included senior support (see 5.3.2), team structures (see 5.2.2.5), rota coordination and effective handovers (see 5.3.1).

Participants also described differences in acuity among certain units within a given specialty, which has a further impact on break taking. For example, while breaks are generally encouraged and facilitated in emergency medicine, one participant explained, *“if you're in somewhere like Resus, where all the sick patients are, you going away for half an hour does make a difference...but you going away for half an hour in Majors or Minors or Ambulatory doesn't make much difference because they're not that sick. So they can wait half an hour... So I'd say you still get [breaks], but you can't take them when you want. So it's more a case of will someone come in and relieve me and then I can go.”* (2143-Registrar)

Patient acuity affects doctors' ability to leave wards and remain accessible. For example, in the emergency department (ED) *“you're not really meant to go out of the department.”* (2143-Registrar)

as *“they want us to be contactable or, if suddenly a very serious emergency happens, they want us to be on standby as well.”* (2064-FY) As a result, although breaks are generally protected for doctors working in ED, *“most of us would not leave ED, we would have our meal, like our lunch or dinner or whatever in the staff room.”* (2045-FY)

5.2.2.4 Staffing

Workload and staffing are intricately linked and almost all participants spoke of the impact that staffing and adequate cover had on break taking, *“otherwise you just have to keep going. Because you know if you don’t do it no one will do it, and you just want to make sure the patients are okay.”* (2067-FY). Like workload, staffing levels can vary day-to-day because *“someone’s on Nights, someone’s on annual leave, someone’s off sick... So maybe every couple of weeks for a couple of days or a week, you might be on your own.”* (2068-FY) Additionally, unpredictable workloads can cause difficulties and variability in staffing meaning that *“some days, we may get that right, on other days we may have way too many staff versus the number of patients coming in and we’re all fighting over one patient.”* (1003-Registrar) This meant that *“there will be some weeks where you can’t take a break because...you’re holding the fort... But then equally there should be times where that swings the other way.”* (3022-Core)

The availability of cover and effective rota coordination was a significant facilitator of the successful break culture in emergency medicine and AMU. For example, in A&E *“the shifts overlap [so] usually when the next lot of doctors start, it means the one that’s been on beforehand can start going for a break.”* (1001-FY) However, in other specialties *“when we’re not on the wards, no one is there for the patients so there’s a sense of ‘we must always be available’. We want to try and do everything as much as we can before we go on our breaks. So, in some ways, it is harder to go on breaks on the wards.”* (2064-FY)

5.2.2.5 Team dynamics

Within a given team or unit participants explained that certain team dynamics, or a team-specific culture, can affect break-taking practice of individual team members. Describing team break-taking practices, one participant explained *“it’s not a written rule, but most people would, I mean at least in my group...everyone, sort of, did the same thing.”* (2045-FY) Another participant explained the importance of *“actually believing that everyone values a break and everyone thinks everyone else should have a break... [Team members of] all levels.* (2004-FY)

A team or ward’s culture can be affected by its structure. For example, in emergency medicine and AMU, where breaks are well facilitated, it was explained that *“we’re a fairly flat hierarchy across the*

emergency medicine spectrum.”(1003-Registrar) As a result, participants explain that “it’s not very hierarchical, but everyone works as a team.” (2032-FY)

Participants described teams as varying in break-taking proficiency – both as individuals and together. For example, *“we’re usually quite good as a team. Someone around lunchtime will say, ‘right I think we should go and take a break’ and trying to make sure we all have a break and at the same time. It’s quite nice.” (2010-FY).* With some more likely to take team breaks with near peers, the composition of a given team or unit can also determine break practices: *“Because there’s quite a few F1’s all working at the same time on trauma and orthopaedics, it’s nice because you can have a break with other people rather than just a lunch by yourself.” (2010-FY)* However, this can be affected by differences between cohorts, where groups of trainees might differ in their levels of integration and need for socialisation: *“We had a particular group that was amazing... They left and the next group who’ve come in have been very separatist.” (3035-Core)*

Additionally, in some teams participants explained how break check-ins (described further in 5.3.2) were not only done by seniors but also by near peers and colleagues *“If you’re looking particularly stressed they’ll be like, ‘Have you had lunch? You need a break. I can cover and just take 15 minutes.’” (2010-FY)* This could include other clinical staff and allied health professionals (AHPs) in the team, for example, *“sometimes the nurse in charge, who maybe has seen that we have been on the ward for so long and we haven’t gone on a break, will prompt us to take a break.” (2064-FY)* Participants valued these gestures because it communicates that *“they support me. They don’t care only about me doing the job, they care about my own wellbeing and I appreciate it so much.” (2179-Core)*

5.2.2.6 Interruptions

Doctors work in multi-professional teams and, for the most part, there are advantages to multidisciplinary working. However, participants described some hurdles in the close working relationship between doctors, and other staff who have different contractual arrangements regarding breaks. Many commented that *“where nurses get scheduled breaks, we don’t. And then they can still bleep you throughout the breaks... Our breaks basically aren’t protected, whereas theirs are.” (2002-FY)* This resulted in inevitable interruptions during doctors’ breaks from *“colleagues, nursing staff, admin, the phone, admin on the phone... constantly. It’s like an open door policy.” (3022-Core)*

While interruptions came from many sources, the bleep was the most common for junior doctors: *“The bleep is... part of being a doctor and if you didn’t have that bleep, then you would be able to get away. But you are always tied to that bleep whilst you are in work, and often lunch break is when someone else is free and they think ‘I’ll just bleep them and ask them about that.’” (2090-Registrar)*

Participants identified the absence of bleeps as another important aspect of the successful break culture in emergency medicine.

Many participants remarked that the urgency of interruptions vary and they are often about non-urgent or redundant matters, for example, *“what I found is that they don't talk to each other... There's been times where they leave like one minute in between to ask the same question... So that's a bit frustrating.”* (2002-FY)

Interruptions were a barrier to restfulness and recovery during breaks. While non-urgent interruptions should allow doctors to return to their breaks, participants explained it would likely signal the end because *“even if it's a job that you don't have to do straight away you still have to go up and answer the phone, write down the job and think about it...so you're not really getting the benefit of the break... Sometimes I just feel like it's handier to just go back and do it than staying on the break.”* (2010-FY) Additionally, interrupting one doctor's break can affect the others: *“Because everyone's carrying a bleep, as soon as one goes off everyone's stress levels rise slightly and everyone's checking... So everyone's still quite switched on. No one really properly relaxes.”* (2010-FY)

5.2.2.7 Seniors

Participants described the significance that seniors' perception of breaks and their behaviour had on the break-taking practice of junior doctors. Juniors explained that, generally, they did not observe seniors taking a break because *“at senior level they're swamped with work, so they would have lunch over their computer doing one thing, going through the handover with us, and they'd be having their lunch at 3pm. So it's not like they're having the good life and making us do all the work.”* (2004-FY)

Participants explained how consultants and senior trainees' break-taking behaviour can affect juniors: *“We don't realise I think but as registrars we're role models for juniors and so if we're bad at taking our breaks it then encourages them not to take their break.”* (2143-Registrar) Indeed a junior participant explained *“my supervisor...often, through caring about patients, ended up taking on much more than she probably should have for her own wellbeing. And so to see somebody I really respected and looked up to and wanted to help out in any way I could pushing herself, it felt really inappropriate for me to be taking long breaks myself.”* (4006-Core)

Seniors checking in with juniors about breaks can alleviate trainee concerns because *“you just need to be given, by a senior, the authority to take that space. And I guess that's what doesn't always happen.”*(3022-Core) However, in surgery *“because the surgeons themselves are often not so present on the wards... when they do come to the ward, they're usually snatching time out of theatre and they're in a hurry so they don't consider asking you, ‘Are you eating?’”* (2043-FY) Check-ins are described further in 5.3.2.

5.2.2.7.1 Generational differences

Broadly speaking, participants commented on some generational and cultural differences between senior and junior doctors. Some participants thought it was a result of different contractual conditions and expectations as *“when seniors were at our stage, it was a very different culture. They didn't take breaks. They were the ones that didn't have the European Time Directive. They were working God knows how many hours. They slept at the hospital... So, comparatively speaking, us not taking a half an hour break...doesn't really match up to what they used to.”* (2002-FY) A senior trainee explained that *“the junior doctor's mind-set has changed a lot... The new levels of doctors that are coming through know what they're meant to be doing with new contracts and European Working Time Directive... Especially with the BMA, who release things like what your working hours are meant to be and your rest periods and all the rest of it... They're aware of it now and I don't think we were aware of it back then.”* (2143-Registrar)

5.2.2.8 Contractual guidelines and policies

Participants explained that, despite increased awareness, oftentimes guidelines or policies were not adhered to. With respect to contracted working hours, most participants found that *“from very, very many guidelines, we have to work an average of 48 hours a week, but I'm sure if everyone actually counted the hours they worked it would go over.”* (2004-FY) Regarding breaks, the current Junior Doctor contract stipulates that juniors should receive one paid half-hour break on shifts of 5 hours, two half-hour breaks on shifts of 9 hours or more and, as of October 2020, three half-hour breaks on shifts of 12 hours or more. They should also be taken separately unless combined in the middle of a shift. However, most participants explained that the majority of junior doctors *“aren't getting, consistently, the amount of breaks and the duration that they should... Most people have a chance to have lunch each day or whatever but I don't think they're getting what they should be getting.”* (2068-FY) A participant commented that *“my own personal experience is a lot of people are either unaware of how much they're meant to be having or really bad at taking it.”* (1003-Registrar) However, participants explained that, in the face of systemic issues such as workload and staffing, guidelines and break entitlement *“doesn't matter because you're not going to take it... It's impossible.”* (2045-FY)

5.2.3 The individual

In different workplaces, the many contextual and procedural factors described thus far combine in unique ways to make up the external landscape in which breaks occur. However, participants also described more personal characteristics, unique to each doctor as an individual, which have an

important effect on break-taking ability, its value, and how one responds to the contextual and procedural barriers to break taking within their work environment.

5.2.3.1 Defining breaks

The way breaks are defined by doctors – the features that distinguish a given length of time as a ‘break’ instead of work – is integral to effectively deciphering whether individual doctors or teams are able to successfully take breaks that are meaningful, restful, and adequately recharge them. As interviewees perceived and defined breaks differently, this theme is classified as an ‘individual’ factor.

Break-taking *ability* implies a dichotomous ability or inability to take breaks. However, across their descriptions of structural, procedural, and/or individual factors, participants described further nuanced aspects of break taking, termed *break practice(s)* in this analysis. In addition to whether breaks are broadly possible in the workplace (yes/no), break practice includes break-taking frequency (number of breaks taken within or across shifts), timing (occurrence within a shift), duration (length of time taken), location (e.g. wards, desks, break facilities), degree of socialising (taken alone or with colleagues), activities performed (work or no work), perceived value (appreciation or attributed importance), and restfulness (the relative contribution to wellness).

Grouping common break practices, participants broadly described three common *types* of breaks:

- 1) ‘Working’ breaks: Exchanging one job for another less onerous job – no food or drink is consumed
- 2) Food and drink breaks: Eating and/or drinking whilst working
- 3) Escape breaks: Temporarily removing oneself from the work environment

The typical frequency, duration, location, degree of socialising, activities performed, value, and restfulness of each break type varied among the participants as a group and also between individuals.

5.2.3.1.1 Working breaks

Many participants described intrawork breaks that were not an ‘escape’ from work, nor did they involve consumption of food or drink, but rather simply an exchange of task type. There were many examples given of administration work being considered a break because *“it’s like time off from clinical [work].”* (2141-SAS) *“I’m not seeing patients or doing procedures... It’s not as intense anyway.”* (2130-Registrar)

For others a mere slowing in the pace of work could define a break, for example when *“you’re not properly away from work or whatever, but you have to prepare for the next patient, so you just sit*

down, write all their stuff on a bit of paper, and that can take like 10 minutes, 15 minutes, so you kind of feel like you're chilling. It slows down the pace of the day... It's automatically a bit of a break."

(2032-FY) Similarly, *"we amble around and ask if anyone needs help with jobs. And that ambling...feels a bit like a break."* (2032-FY).

5.2.3.1.2 Food and drink breaks

For most participants breaks were typically described as times when *"I would eat my food while I'm doing the paper work."* (2064-FY) Indeed one participant explained, *"My version of a break is eating [while] reading journal articles and stuff. So I don't stop, I just do other [work]"* (2130-Registrar), while another participant felt that, regardless of what is being done alongside it, *"the act of having a tea or having a coffee just kind of implies a break."* (2004-FY).

Participants explained this type of break is so common because *"it's hard to justify taking a [real/escape] break... I'm not that tired and actually I can just get these few bits done while I'm sitting eating my apple, drinking coffee... That's just what we're used to."* (2002-FY)

Depending on the layout of the office, this can be done as a team, for example: *"I bring my lunch from home and I usually just sit in the office...but other people are there, so, you know, you're chatting away but also you're having a little look at the bloods and the list."* (2045-FY) Another common type of communal food and drink break was the *"teaching at lunchtime. At like 1 o'clock or half 12 we have teaching with our lunch so we are sort of stopping a bit more at that point, because we are having a break from work."* (2068-FY)

Regarding the restfulness of this type of break, participants explained *"I find it semi-restful"* (2130-Registrar), however, *"not as much as properly taking a break but it does help."* (2064-FY). Participants explained that *"it's not really a break so much as just refuelling while you go"* (2010-FY) and *"it's never truly a proper switch off"* (2002-FY). It was more common for participants to describe 'escape breaks' as the 'proper' or 'real' breaks.

5.2.3.1.3 Escape breaks

For most participants, breaks were defined as the standard 'escape from work' that aligns with many office jobs. Some described these 'proper' breaks as *"physically going to another space... [because] if you just sit in a room then people can't tell you're on a break."* (2004-FY) The duration of these breaks could differ from food and drink breaks because *"if we're in the office, it tends to be a much, much shorter break, but if we have time to go somewhere like the mess or the canteen, then it's about half an hour probably."* (2010-FY)

Participants explained that these types of breaks are infrequent because *“there aren’t many times where we take a break away from the office.”* (2068-FY) There was often a sense of guilt around physically leaving the workspace, particularly in acute settings, because *“if you’ve got sick people in the ward it’s very difficult to get away, even from the office. You’d rather just be hanging on the periphery just in case you need to run to that room.”* (2002-FY)

Interviewees noted that while working breaks or food and drink breaks are most common among doctors out of necessity, *“I’d prefer every day to go down to the doctors’ mess and eat my lunch, having a proper break.”* (2068-FY) Participants described this as the most restful type of break, because *“being off shop floor does dramatically help... If I had the ability to...leave the department... just a change of atmosphere and environment, I probably would feel more refreshed.”* (1003-Registrar) and *“if there was a day when I couldn’t make it down to the mess because I was so busy, then I’d really notice it. I wouldn’t feel as good as the days when I could go down.”* (2032-FY) Many participants also valued these breaks for the ability to socialise *“I can see other junior doctors...from other specialities who I might not have seen for a while... It’s nice to catch up and forget about work for a while.”* (2064-FY)

5.2.3.2 Personality: Doctors as ‘doers’

In a profession where escape breaks are rare and there is a focus on task completion, it is not surprising that most interviewees described themselves as task-oriented ‘doers’. Some explained that they thrived on task-switching and the busy nature of the profession.

“I like work... If I did nothing I feel like I’d be wasting my time slightly.” (2130-Registrar)

“I found it hard to drag myself in knowing that I was going to just sit there being mostly useless all day... compared to the previous placement where it was way too much work, but actually you do get some satisfaction out of that.” (2004-FY)

With the high workload, many described an ever-increasing list of tasks as an intrinsic part of the job and a need for individual resilience to it because *“if I’m going to stay one or two or more hours, if I need to come one hour earlier, just to be able to catch up with the pace of the NHS and how it works and to cope with my duties...I will be happy to do that. Because at the end of the day it will help me cope faster... It will help me be more competent in the future.”* (2179-Core)

Participants often commented that *“we prioritise the work and we prioritise our patients above everything”* (2179-Core) and that this affected break practice *“because [doctors] feel the pressure of the long waits and feel like they probably shouldn’t go.”* (2143-Registrar) With a pervasive sense of

guilt around break taking and a sense of duty to patients, it is perhaps unsurprising that many participants described food and drink breaks as the most common practice.

With the majority of doctors being task-oriented 'doers' who consider patients a priority, and career progression mildly dependent on this, the structures and processes in which doctors work (often involving hard work with few breaks) were described as an enabler to this aspect of their personalities and *"it's very easy to lose track of that and to just work straight through, because no one's going to tell you, 'Have you had a break?'"* (3035-Core). After several years of experience, a senior trainee explained: *"I love hospital medicine... I enjoy the buzz and the pace of it. But it's not good for me. I recognize that I'm a workaholic and it feeds into that."* (4009-Registrar)

5.2.3.3 Breaks as an individual responsibility

With 'doctors as doers', the perceived importance of resilience to perform the job, and a culture that generally prioritises task completion over self-care, breaks were often described as the responsibility of the individual doctor. Regardless of grade or seniority *"they always say to us, 'You're adults, you can get your own breaks.'"* (2002-FY) Indeed, despite the many aforementioned structural and procedural barriers to break taking, participants from various specialties and grades commented that break-taking practice is primarily affected by an individual's proficiency at managing their workload and that *"if you're not taking breaks it's probably 'cause you've not managed that [the workload] correctly or you've not factored in break time."* (3022-Core) Similarly, when *"I didn't actually get a chance for lunch...it was probably my own fault for not sitting down and making the time... but you can kind of lose track of time sometimes."* (2010-FY)

5.2.3.4 Needs and preferences

With the onus on the individual to take breaks, some individuals noted that in their role *"there's most definitely space for break...it's just me choosing not to"* (2130-Registrar) or that *"I would rather do the jobs if I need to do them."* (2068-FY) Indeed while most participants preferred to have an escape break, where possible, they noted that *"some juniors might say the opposite, they might say that they quite enjoy just getting it done with"* (2045-FY) because *"they want to get in, do the job and get out."* (3035-Core) This can be for a variety of reasons, including the individual's personal wellbeing needs and their preferences.

Participants spoke of inter-individual differences in the required break duration, frequency, or the type of break to feel rested and adequately recovered. For some *"five minutes is enough."* (2130-Registrar) while others needed substantially longer. There were also inter-individual differences in the ideal timing of breaks within a shift for a sense of wellbeing. Some participants *"need to eat earlier because otherwise I get hungry"* (2068-FY) and others *"try to take it halfway"*

through...[because] if you take it too early...it'd be difficult to sustain energy and enthusiasm for the rest of the shift. [But] if you take it too late...you can get quite headache and tired because you should have gone and had something to eat hours ago." (2143-Registrar). Some participants took breaks once a particular block of work (e.g. ward round) was complete, while others needed breaks sooner because *"it might not seem that 1 or 2 patients is a lot, [but] to me when my brain is absolutely giving up, I would rather just stop and eat something."* (2045-FY)

There were not only inter-individual differences in the *requirements* for wellbeing but also individual *preferences* for a particular type of break, the frequency or duration of breaks, and whether they are better taken as a team or unaccompanied. Some participants preferred solitude, explaining *"I'm quite happy to go by myself. You can catch up with life bits and pieces, the 50 million emails you end up with, and bits and bobs."* (1001-FY), while for others breaks with colleagues were important because *"it really refreshes me... I like talking to other people during my break, always having them around me, even if I'm on my phone. I just like being an environment where there's other people. And I prefer it if there are people I know and I'm friends with...like the other F1s."* (2032-FY); and yet another group of participants preferred *"a bit of both, it depends on the day."* (2067-FY)

Participants also commented on preferences with regard to 'shop talk' on a break. Some explained *"there's nothing worse than someone coming in talking to you [about work] in the middle of it... I'd much rather talk to someone about what they're up to at the weekend or what they're having for dinner, rather than talk about work-related stuff."* (2143-Registrar) However, for others breaks presented a valuable opportunity to debrief with near peers about *"what's gone wrong in the day, what's happened that you didn't really expect or out of your control really. It's like our patients not turning up or someone called in sick or something... Just to, I suppose in a way, de-stress."* (2141-SAS)

5.2.3.5 Skills and experience

With the individual allocated responsibility for taking their breaks, participants described some individuals as having greater proficiency at break taking than others. *"I'm particularly not very good at taking breaks. Some other people are better at it."* (2002-FY) Many participants explained that certain skills are key to empowering and enabling individuals to be proficient at break taking. These are predominantly gained through experience and the passing of time. Some newly qualified doctors, or those new to the NHS, recognised this and commented that the profession's threat to their wellbeing might be temporary because *"I am new to the system... I need to go the extra mile for me to blend in, to fit in, to be competent... I am prepared psychologically for the exceptional circumstances, specifically in the very first few months... In the future I will be more experienced and know how to do things fast."* (2179-Core) Indeed a senior trainee explained that *"I do come now with 10 years' worth of all those other skills, like the prioritization, the confidence, that sort of thing. I can*

manage myself a lot better than when I was brand new... So I can, if I want to, sit here and have 15 minutes to have a cup of tea.” (3035-Core)

5.2.3.6 Perception of breaks

In addition to their needs, preferences, skills and experience, the value or importance an individual placed on breaks dictated their prioritisation of it in the workplace. Most participants described an awareness of the importance of breaks, relating to the consequences of missing breaks, as well as the resulting consequences of taking them. The perception, or prioritisation, of breaks involved a cost/benefit analysis for each individual.

5.2.3.6.1 Consequences of missing breaks

Participants spoke of the perceived consequences for patients and job performance if they missed breaks: *“I’m aware that we should all be trying to take breaks and probably work more efficiently after them.” (2010-FY)* One participant described a sense of irony in the widespread belief that taking breaks hinders a doctor’s ability to complete their work: *“We all know we don’t work well when we work through our lunch... You just end up being slower and not actually thinking very well... [Yet] we try and work through our breaks thinking it will make us faster.” (2067-FY)*

Participants also described the consequences of missed breaks on personal wellbeing, explaining that *“I know that I always feel better after a break. I never regret taking a break.” (2067-FY)* In some specialties, like psychiatry, breaks were described as *“probably more important because...if you have been emotionally exhausted, you might find it really hard to connect with your partner that evening or with your children, you might find it hard to sleep, or to even take your mind off it with anything. So I think it is really hard on people in a different way than a more traditional medical job.” (4006-Core)* In addition to mental health consequences, an interviewee described a very severe physical consequence when they worked in an environment where they felt unable to take breaks for a long period of time: *“From sitting down all the time and not drinking...I ended up with a UTI... I got paranephritis, I ended up with sepsis, my liver failed, my kidneys failed. I was in hospital for weeks because I developed multi organ failure sepsis, and I nearly died.” (3035-Core)*

5.2.3.6.2 Consequences of taking breaks

Despite many participants acknowledging the importance of escape breaks for their performance and wellbeing, most *“just sort of work on the computer and have our lunch in front of us.” (2002-FY)* Some described a sense of guilt if they do not take this approach because *“everyone’s waiting 6 plus hours and the patients are getting quite upset and the families. And I understand...because I’ve been on the other side as well. You can’t go and just take another half an hour, you might as well just*

power through." (2045-FY) Others were concerned about the subsequent impact on colleagues because *"if you knew you have a big list of things to do, you get to the end of the day and either stay late and do them or hand over a big list of jobs to someone else. So I think sometimes you can sort of guilt trip yourself out of taking a break."* (2010-FY)

The majority of interviewees commented that, due to the high workload, taking breaks unavoidably delays a shift's finish time. As a result, each day there is a choice that doctors make: *"Either you can take your break and then just hope you finish on time, or just work through it and then you've got a better chance of going home on time."* (2002-FY). The participant explained that missing a break is seen as *"damage limitation"*. Each doctor has their own preferences with regards to this inevitable choice, however, most commented *"I'd much rather not have a lunch break and leave on time."* (2043-FY) or that *"I don't mind doing jobs whilst I'm eating because I don't want to stay late"* (2068-FY) Additionally, the choice between leaving on time and taking a break can be complicated by the variable nature of the work, which can mean that the consequences of taking a break are not truly known until the end of the shift: *"You constantly feel like you want to be ahead of the game. So if you take a half-hour lunch break and then something comes up and you end up staying late because you have to request a blood test that you could have requested on your lunch break, you're pissed off... sorry, you're cross."* (2043-FY)

5.2.3.7 Autonomy and power

Thus far interviewees have described structures and processes which combine to create an environment that, for the most part, makes break taking challenging. Concurrently, participants described how doctors (regardless of seniority) are ascribed the primary responsibility for taking their own breaks. These statements might appear to contradict one another. However, while many barriers to break taking are imposed on doctors by external factors (the profession, culture, their teams, specialties, trusts and/or governing bodies), participants explained that the individual has a level of power and autonomy to choose their response to the circumstances. This response varies across individuals because *"every medic has a set of rules in their own head about what they're willing to do. Some will be very boundaried... [whereas] some medics, they want to be liked, and they want to do everything, because they're so terrified of getting that one bad report in their portfolio."* (3035-Core)

Many recognised the importance of maintaining boundaries as *"there is some...satisfaction out of making sure something is done properly. But...I feel if you don't make a limit, if you don't artificially put a line down, then it's just easy to keep pushing and pushing it further and further."* (2004-FY) However, some participants described being powerless to the structures within which they work. Junior trainees spoke of the sense of impermanence and facelessness of being a trainee: *"[Seniors]*

just don't really bother as much to get to know the juniors...because we're changing all the time." (2010-FY) As a result, *"it takes a lot before they realize I'm [name], I'm not 'the trainee'... All trainees are like one entity so there's no individualization."* (3035-Core). The lack of rapport-building meant that *"you feel less comfortable approaching [seniors] with little questions and you can be more stressed about asking them things just informally."* (2010-FY) As a result, juniors often had difficulty querying workload and breaks. For example: *"[my senior] was just like, 'I don't think we're giving you too much.'...and he's marking everything I'm doing...so I backed down... I should have been more forceful but it's very hard when people are saying 'No, you're wrong, you shouldn't need to have a drink.'"* (3035-Core)

Within a dominant culture of break skipping and power inequality, participants described how doctors needed to be resilient and 'swim against the tide' to proactively enforce their boundaries and identify opportunities for breaks. Participants explained that *"you have to try and build breaks into your day a bit sneakily in this job. One thing to try as a tactic... It's not an insignificant part of everyone's day that's spent trekking back and forth, seeing people [and] going back and documenting... In and amongst that, you can grab five minutes to go and get a bit of fresh air, grab a coffee, because as soon as you go back into the office, it's fair game to be asked a thousand questions."* (3022-Core) Additionally, *"from 3 to 8am it's just one team, there's no overlap of any shifts. So you should try to get your break before that happens."* (2045-FY)

Beyond 'tactics', participants explained that the level of autonomy and protection and assertion of boundaries gets easier as a doctor gains time and experience in the profession. A senior trainee explained that in comparison with when they were new to the profession, *"I feel more in control. And just knowing that I feel more in control means that my behaviour follows suit... I'm more likely to think, 'You know what? No, I have every right to take a break now. I'm putting down my pen.... I'm not being lazy. You don't have to do everything that minute.'"* (3035-Core)

5.3 Looking forward: Opportunities for intervention

Although participants described many organisational, procedural and individual factors that affect, and generally hinder, their break-taking practice, it is encouraging that some participants found creative means of facilitating breaks within the challenging circumstances. This suggests that, despite the complex array of interconnected barriers, there is potential for interventions to facilitate more 'escape breaks'. Alongside the preceding surveys, which provided an idea of the group-level priorities for intervention, interviewees described interventions, or properties thereof, which could make a meaningful difference to their break practice.

5.3.1 Staffing interventions

It is clear that workload and staffing were the most common barriers to breaks and they directly affected one another. Interventions which made sufficient staff available to manage the workload removed the primary perception of break skipping as *“damage limitation”* (2002-FY) – i.e. the widely-held belief that taking a break delays a shift’s end. Those which made the biggest difference to breaks included good-quality handovers and better rota coordination.

5.3.1.1 Rota coordination

Participants described a need for adequate ‘cover’ to take breaks, which generally referred to the availability of another doctor with equal or more skills and experience so that a doctor’s duties would be covered in their absence. Rota coordination determined whether there was sufficient staff to achieve this on a given shift and *“if you’re well-staffed...you could take turns”* (2045-FY). Effective rota coordination could allow for adequate cover and/or ring-fence sufficient time for handovers – important determinants of break taking. However, a participant explained *“the only time I’ve ever worked on rotas that were half decent is when they were done by consultants or by registrars...rather than by administrators. It’s just too tough a job. It needs to be done by somebody who understands it better, by somebody who is better paid... People shouldn’t be earning a band 2 wage and being asked to do such an important and difficult job.”* (4009-Registrar)

5.3.1.2 Handovers

With better staffing, handing over tasks at the end of a shift was more likely and removed the perception of breaks as a hindrance to going home on time. Emergency medicine and AMU were particularly proficient at this, which was important to their successful break-taking culture: *“On AMU there is someone who stays late...so you are meant to leave on time and just hand over whatever you haven’t managed to do...regardless of how small it is...which no-one else seems to be able to replicate except ED.”* (2032-FY). Due to the importance placed on the handover, *“everyone, the consultants, everyone is at the handover on time.”* (2004-FY) A participant explained that these successful handover and break practices *“could be achievable [on the wards] if it was structured a bit differently, or we had a few more doctors on lates, or if you had a few more doctors on mid-day.”* (2032-FY)

Handovers could be opportunistic, for example *“it will be a consultant noticing that you need to be relieved and then send in someone so that you can then go for lunch.”* (2143 Registrar) However, a regular, structured handover appeared most effective at facilitating breaks because *“you know that you can prioritize the jobs that need done, and the jobs that can be handed over and then you can make time for a break.”* (2010-FY).

Other factors which encouraged good-quality handovers included the speed and convenience of the method as *“a verbal hand over is always, always easier than doing some kind of phone thing or a computer eQuest thing [which] have to be cleared by the nurses to go on the list.”* (2032-FY)

5.3.2 Senior support and check-ins

Junior doctors described how they model the behaviours of their seniors or look to them to decipher expectations (see 5.2.2.7). In the absence of time to take breaks themselves, seniors regularly encouraging, or enquiring about, junior’s breaks was described as an effective facilitator: *“If a senior says, ‘have you taken a break?’, or tells you to go and take a break, then you feel a bit less guilty about doing that when there’s half a million tasks left to be done.”* (2090-Registrar)

Participants also described a ‘trickle-down’ effect, for example, in emergency medicine where *“the consultants...will nag you to make sure you’ve had a break or set you a time, and they do check. Equally, as a result, the mentality cascades down and so I will subsequently check on my juniors to make sure that they’ve had their breaks.”* (1003-Registrar) Senior support and prioritisation of breaks was highlighted by many participants as another important facet of the specialty’s successful break culture.

Some participants described situations where seniors went beyond simply checking that basic necessities are met, that juniors have ‘fed and watered’, and instead actively facilitated escape breaks: *“Probably once a week our consultant might invite us for a coffee... If we were contacted in the break sometimes our consultant would take the call for us instead, even if it came through to one of the juniors’ phones.”* (4006-Core) These gestures, along with check-ins, not only showed juniors that seniors care about their wellbeing but could also reap benefits for seniors and the broader team as *“you then get a lot back from that junior... If you say ‘thank you’, people don’t mind going out of their way and doing more, provided they know that what they’re doing is appreciated and valued... Coming across and asking about their welfare and breaks is just part of that.”* (2090-Registrar)

5.3.3 Bleep-free time

Many participants highlighted interruptions as a barrier to escape breaks and wellbeing activities. Regarding mindfulness activities, for example, a participant asked: *“What do you do with the bleep, bring it in with you or leave it outside? [laughs] Yeah, if you can get someone to hold your bleep, then maybe [it would be useful].”* (2090-Registrar) Equally participants understood the need to be accessible as *“you might get a call out of the blue with some fairly urgent situation happening on the ward, and so there’s a real sense of discomfort of taking yourself fully out of being contactable or reachable by your team, even for a short amount of time... It just seems indulgent.”* (4006-Core)

While some departments have attempted to prevent unnecessary interruptions, participants explained that *“we're supposed to have a break, a bleep-free time, between 12 and 2, but no one adheres to that. We get bleeps all the way through that time.”* (2068-FY). Participants described ways to achieve bleep-free periods: *“They're trying to introduce more messaging services and things... if you get a message come through and it's something not urgent then obviously you don't have to go to a telephone and answer it there and then, because there is someone waiting on the other line... But the Wi-Fi in Southampton and the technology for wards to send messages, I think, is a long way off yet.”* (2090-Registrar) Improvements to current IT systems and messaging around bleep-free hours therefore have the potential to facilitate better break-taking practices among doctors and engagement with wellbeing interventions.

5.3.4 Exception reporting

Since 2016 it has been possible for junior doctors to not only report working beyond their contracted hours but reports can also be made if they consistently miss over 25% of their breaks. However, all participants described this section of exception reports as futile and ineffectual. Many explained that, for them and their peers, *“it just feels like you're being pedantic... It feels like there is an obvious line to draw if you're meant to finish at 4:30 and you don't finish at 4:30 ... That's very clear cut. Whereas with breaks you're like ‘well, I kinda didn't do anything for those ten minutes. And then yesterday, actually, I had an hour and a half break because there was a lull.’ I feel it's a lot harder to justify.”* (2004-FY) Indeed the justification for missed breaks (or working beyond contracted hours) in an exception report was a difficult hurdle for juniors because *“it goes to your supervisor to approve it... It goes to my consultant, who's probably someone who's not very approachable, who's going to probably question and say, ‘You're just slow.’”* (2045-FY) Although participants understood that *“there's probably no way around it”* (2045-FY), in its current form, the exception reporting process and need for senior endorsement is discouraging the use of the tool.

5.3.5 Facilities

Although other system-level issues were given greater priority for intervention at a group level in the survey data, for some interviewees, escape breaks were also hindered by a lack of facilities (see 5.2.1.5). Communal break spaces were often lost and repurposed, including spaces for opportunistic break and wellbeing activities – for example, in an oncology department, *“staff could pop up and get free therapies, four short therapies whether that's Reiki, foot massage, head massage, whatever... Due to capacity that's changed... I don't know whether they can get the space at the moment.”* (2090-Registrar).

Through consultation with a wide range of doctors from different specialties and locations, trusts can decipher whether opening hours can be extended and whether certain facilities can be moved or built to allow all doctors equal opportunities to benefit from them. Additionally, upgrading break facilities and related infrastructure to include certain amenities (e.g. Wi-Fi or phone signal) might encourage their use and improve break-taking practice.

Participants also valued outdoor spaces, when they were available, and described them as a facilitator to more active and/or sociable breaks (e.g. walking groups) as well as their ability to fully escape: *“The job that we do, we're inside all the time. I'd much prefer being outside. So, if there's nice outside spaces, when the weather's good I would definitely be outside getting a bit of fresh air in the sun... But all I've seen is like two benches outside the front entrance.”* (2130-Registrar) Having outdoor breaks as a viable option (in locations where it is feasible) and/or improving outdoor spaces to be more inviting could therefore help to facilitate better and healthier break-taking behaviours. However, any intervention targeting facilities would be contingent on doctors having opportunities for escape breaks by addressing the other more pressing systemic barriers.

5.3.6 Activities and wellbeing sessions

Infrastructural interventions and changes described above tend to take time, and significant financial investment, to implement. Activities and wellbeing sessions are often more appealing to trusts, who wish to see results sooner. Many participants described a need or preference for escape breaks to feel a sense of recovery during a break. Scheduled or opportunistic activities would appear to offer this sense of escape. Interviewees discussed a range of break activities and interventions that they had experienced, seen offered, or preferred themselves, as well as a host of factors affecting whether they could attend.

5.3.6.1 Food

Participants explained that free food was often an effective motivator to encourage breaks and attendance at activities. For example, *“the Schwartz rounds in other hospitals work because they put on a free lunch... That's what attracts them... They know that they're in for a hot free lunch and then they all turn up.”* (2143-Registrar) It can also act as a motivator for senior members of staff, providing the necessary permission to postpone non-urgent work: *“When the reps come and have free lunch and free teaching, it makes the consultants say, ‘Oh, shall we go to teaching?’... We leave a couple of patients, so instead of powering through at 12:30... we're fed and watered and then we finish the two or three patients that are left.”* (2045-FY)

5.3.6.2 Exercise

Some participants felt that engaging in exercise would be beneficial to them: *"I think the Poole [Hospital] initiative of a group of people meeting up and going outside and seeing daylight and walking around somewhere, which is fairly inspirational, is a really positive thing."* (2090-Registrar) However, not all sites offered the outdoor or indoor facilities for these activities.

5.3.6.3 Mindfulness

Social interventions, such as group exercise sessions, were valued by some participants, while solitary activities, such as sensory pods (portable spaces for staff to temporarily 'escape'), were more valued by others. Some felt that sensory pods or mindfulness sessions could be useful because *"it's really hard to switch off. Your brain sort of feels like it's working really fast... It would be nice to be able to take a step back and slow down a little bit"* (2010-FY) Participants remarked that these types of mindful, slower-paced activities would be beneficial at certain times, for example *"on shifts that are very bad and not enjoyable... The 10 percent of shifts that are pretty busy, I think those things would be useful"* (2130-Registrar)

5.3.6.4 Opportunistic activities

Participants described some opportunistic activities that often depend on the unit a doctor works in (e.g. the free massage treatments in the oncology department in previous years). A novel, but increasingly popular, 'wellness' activity in Hospital environments is therapy dog visits. Southampton Children's Hospital have a team of visiting therapy dogs for patients, but many staff have derived benefit from their visits through opportunistic meetings: *"I've met one of the therapy dogs the other day... It's just so nice. We were all sort of crawling around petting the dog for like five minutes."*(2010-FY) *"I remember when I did work on the wards and the PAT [Pets As Therapy] dogs would come on. You kind of feel like you shouldn't take up their time, because maybe the dog's there for the patient, but actually it cheers everyone up so much, to spend some time with an animal."* (4006-Core) As the infrastructure already exists in some trusts or departments, this type of activity could be utilized as a type of microbreak activity for doctors who describe being restricted on time.

5.3.6.5 Factors affecting attendance

Some participants explained that scheduled, externally-hosted activities could function as permission to take a break. *"If it's something that is from the outside that's happening, it is more likely that we actually go. The consultants will say, 'Let's take that break'."* (2045-FY) However, the ability to attend structured activities was questioned by all participants, explaining that *"It's so varied that some days it would just be way too busy to do something like that. But other days...you might feel quite okay*

with time." (2068-FY) Interviewees explained that *"I think I'd speak for a lot of medics, I just assume none of that stuff is aimed at us. It's kinda assumed we're doctors we'll just get on with it."* (3022-Core) This was because *"I suppose our lives are different to someone who works in an office. The routines are different, everything is different... And it's not saying it's more or less stressful. It's just different. And so the solutions [for wellbeing] will be different."* (2043-FY) As a result, certain factors affect the ability, or motivation, for doctors to attend any potential break activity or intervention.

5.3.6.5.1 Scheduling

Some participants had a preference for the timing of activities, with some preferring them *"at the end of the day... It gives you the authority to switch off a bit early."* (3022-Core) For others *"it would be quite nice to have a little breather in the middle."* (2010-FY) Different shift types means that, for example *"people start in A&E all different times, so 8AM then 12 thirty and then 5 at night and then at 10 at night. So there are people who are tired or stressed I suppose at any point during that day"* (2143-Registrar). Indeed break times varied significantly among doctors as *"[in respiratory] I would take my break at maybe 3pm, when I am meant to finish at 5... But in the emergency department they make us start taking our breaks at, for example, 1 or 2."* (2064-FY) Additionally, juniors were often dependent on consultants for break timing during ward rounds. The regularity of an activity could also affect attendance because *"If you knew it was a regular thing or when it was going to happen, it's more likely that you'd be able to work your day around that."* (2068-FY) To offer doctors the opportunity to attend a given activity, planners would potentially need to confer with senior staff, host the activity regularly, and at varying times of the day.

5.3.6.5.2 Location

Participants often liked the idea of certain activities but were concerned about their ability to attend due to its location, particularly in specialties like emergency medicine: *"That would be good for other doctors and the other bits of the hospital... We wouldn't be allowed to go but all the other specialities could."* (2143-Registrar) Consequently, interventions that are mobile and/or adaptable to different environments might better support access.

5.3.6.5.3 Voluntary vs mandatory

Participants explained that whether an activity is compulsory or voluntary could also affect attendance *"At times I've seen... a 'drop-in' staff wellbeing session... As soon as something is 'drop-in' people are like, 'what if I say I want to go?'... You can't all go at the same time."* (3022-Core)

Indeed the idea of mandatory breaks (e.g. all doctors take a 30-minute break at some point on their shift) was favourable to many participants because *"sometimes you can feel a bit guilty taking a*

break, if you knew you have a big list of things to do... I think if it was mandatory, then you probably feel a bit less guilty having a guaranteed break.” (2010-FY) However, some were sceptical about the feasibility of a mandatory break or activity: *“I think theoretically it would be a good thing, but I don't think it would necessarily work. How do you make a break mandatory?”* (2004-FY)

5.3.6.5.4 Subject matter

While many NHS trusts have attempted to offer wellbeing sessions for staff, participants explained that this can sometimes have the opposite effect, particularly educational sessions on resilience: *“If the job requires you to just be more resilient to survive, the job is terrible... The more we hear about it, the worse we feel. We would all feel much better if you gave us that hour just of free time to go and live our lives... I know it's done with the best of intentions, but actually...we're all quite educated about mental health as a group compared to the general population.”* (2043-FY) It was not only the subject matter that was important, but also who delivered a given session: *“If someone who doesn't work as a junior doctor or doesn't work in the NHS, certainly doesn't have contact with lots of Junior doctors, comes and tells us how we can better improve our lives, we're never going to be that interested.”* (2043-FY)

Additionally, the structure of a given activity was important to some: *“I think people like things that are task orientated. So I think if you just say mindfulness for an hour, I think people might struggle with that... Whereas I think if it's not team building but like an activity - a thing that you can focus on but isn't clinical and doesn't generate anxiety or force you to have to think lots...I quite like that.”* (3022-Core)

5.4 Discussion

5.4.1 Factors affecting doctors' break-taking practice

The survey conducted with doctors in Chapter 4 suggested that the majority of doctors perceived breaks as important to their wellbeing but were often unable to take them. A thematic analysis of the follow-up interview data provided an explanation for these seemingly contradictory results with a deeper understanding of the many factors that affected doctors' break-taking practices. This included a host of others not identified by the survey method. The thematic analysis also showed how the many factors interacted with each other to affect doctors' ability to take breaks.

Structural, procedural and individual-level factors created the set of circumstances that determine break-taking practice. Structures and contexts were important to the opportunities afforded to doctors for break taking. Trusts, hospital sites, departments and specialties differed in many ways,

including their geographical location, the layout and facilities available, and the cultural norms regarding breaks and wellbeing. Within these contexts participants described differences on a more local team and procedural level that affected break-taking practice. Similar to the results of the survey in Chapter 4, workload and staffing were particularly important (and interrelated) procedural-level factors that determined break-taking practice. Their relative effect on breaks was also influenced by other procedural factors, including patient acuity and the need to remain accessible, job role characteristics (grade, shifts, part-time working), team dynamics, interruptions and relationships with other clinical staff, the presence and support of seniors, and the interpretation or enactment of contractual guidance and policies. Combined, these structural and procedural factors created the unique set of circumstances (the 'landscape') in which intrawork break taking occurred. Within the externally-imposed circumstances, each individual brought a unique combination of personality traits, needs, preferences, skills, experience, perceptions, and levels of autonomy and power.

Although the many contextual and procedural (external) barriers interacted and regularly deterred doctors from taking 'proper' (meaningful and restful) breaks, doctors were ascribed the responsibility for taking their own breaks. This resulted in an inevitable daily choice between taking a break or finishing work on time. Some participants described a third option, however, where an individual's autonomy, resilience, and a level of creativity was utilised to overcome the systemic barriers to break taking. The skills required to do this were often acquired with time and therefore more senior trainees, who had performed the job for longer, found themselves more easily able to find and/or create the opportunities for breaks. Others, particularly more junior trainees, described a need for, and prioritisation of, strict individual boundaries to empower a doctor to designate break times in the work day.

These results, and the thematic framework, share some similarities with research elsewhere. In a focus group study with emergency medicine physicians in the US (O'Shea et al., 2020), participants described how breaks were important to their physical, cognitive, and emotional wellbeing but there were shared beliefs and a culture that deterred breaks. They described a desire to be absent from wards to avoid interruptions (similar to 'escape breaks') but a need to remain accessible and contactable. Participants also described how an individual's skills and experience as well as the use of inventive strategies were important to break-taking proficiency within the challenging environment.

5.4.2 Defining breaks

An important aspect of the interviews was in deciphering how doctors describe and attribute meaning to the term 'breaks'. Break taking was described with greater nuance than a dichotomous

break-taking ability (i.e. able or unable). In the analysis this was termed *break practice(s)*, which accounted for break duration, frequency, timing, location, activities performed, degree of socialising, value, and restfulness. This conceptual understanding of break taking shares similarities with the findings of Lyubykh et al. (2022) – described in Chapter 3 (see 3.8.1) – who reviewed various operationalisations of ‘work breaks’ in literature on knowledge workers (jobs requiring specialist theoretical knowledge, usually requiring formal education).

The analysis revealed three common *types* of break practice: 1) *‘Working’ breaks* – exchanging one work task for another less-onerous one (e.g. administrative work instead of patient-facing work, walking from one work environment to another), 2) *Food and drink breaks* – the length of time it takes for a doctor to consume food or drink, often while performing work, and 3) *Escape breaks* – a period of time spent away from work tasks (physically and/or mentally).

For most participants ‘escape breaks’ were viewed as ‘real’ or ‘proper’ breaks – similar to the 30- to 60-minute lunch breaks taken in industrial or office settings. This type of break is also congruous with the contractual guidance for junior doctors which stipulates the need for 30-minute breaks in a typical shift. However, ‘working’ breaks and food and drink breaks were reported as the most common practice due to pressures of workload and the aforementioned inevitable choice between finishing a shift late or taking a ‘proper’ break. This explains why the survey sample described themselves as infrequently taking breaks – it is likely that the sample was reporting on ‘escape breaks’ as opposed to food and drink or ‘working’ breaks. It is unsurprising therefore that, in the survey data, improvement to break facilities was not rated as a priority for facilitating breaks – it is likely the doctors surveyed and interviewed were not regularly able to escape the work environment to use the facilities. Nevertheless, participants described some interventions (or properties thereof) that could have a meaningful impact on their opportunities, or likelihood, to take breaks.

5.4.3 Opportunities for intervention

For each individual, team and context, there is a unique combination of factors affecting break taking. These factors complicate the requirements for effective interventions and determines whether they will, or can, be implemented or indeed utilized (e.g. a given specialty’s ability to leave their ward and attend interventions, the opportunistic nature of breaks, usual timing and duration of breaks). Additionally, with preferences and cultures differing among specialties, teams and individuals (e.g. solitude vs team breaks), the data suggests that a single intervention is not likely to attenuate all barriers to break taking. A suite of procedural and system-level interventions is likely necessary to see tangible improvement in break-taking frequency. For example, upgrading or building break facilities (as well as ensuring they are open and accessible during night shifts) might

encourage their use, but this is likely dependent on other broader contextual and procedural barriers being attenuated to allow the opportunity for a break.

From participants' accounts (as well as the survey data in Chapter 4), the most significant factor in affording the opportunity for breaks is staffing and cover. Breaks, particularly escape breaks, depend on a doctor's ability to leave their workspace (physically and/or mentally) and this is often not possible without adequate cover. Adequate cover is required for a) urgent matters that arise in the doctors' absence, b) to alleviate the sense of guilt attached to patients' needs not being met, and c) to remove the inevitable choice between either finishing their shift late or leaving a large list of jobs to colleagues at handover. However, changes of this magnitude likely require large financial and/or logistical investment for trusts and administrators.

As infrastructure changes (like staffing and workload) take time to implement, smaller infrastructure or procedural changes, as well as external activity-based interventions, offer a potential (though less significant) stopgap. For example, improving communication between clinical staff and rota coordinators and/or allocating rota coordination responsibilities to senior doctors, if another responsibility of equal magnitude can be transferred or substituted, could allow better utilisation of the staff available. Research in an Australian setting found that it is feasible to improve break-taking prevalence through better rota coordination, without increasing staffing levels, by ensuring there are two doctors working on a given shift that can act as cover for each other during breaks (Mitra et al., 2008).

Senior behaviour was found to be an important factor in break-taking practice. While seniors might feel they are only 'harming themselves' by missing breaks, they are unintentionally modelling unhealthy habits that become accepted as the expected norm. In emergency medicine, where junior and senior trainees described a comparatively more successful break-taking culture than other specialties, participants described how seniors actively encouraged breaks, and checked whether juniors had taken them. If not, there were instances where seniors would attempt to find solutions to the barriers by either covering the work themselves or delegating it to others. This practice then 'trickled down' to senior trainees who did the same for their juniors. This suggests that senior staff have a large part to play in moulding break-taking culture.

As unnecessary interruptions were described as significant barriers, improving IT systems and WiFi connectivity might improve the likelihood of breaks by facilitating better use of messaging services (which allows doctors to triage enquiries as urgent or non-urgent), reducing reliance on bleeps, and allowing doctors to attend the mess or canteen. Additionally, better messaging around bleep-free time to other clinical staff and AHPs could also minimise interruptions, which was frequently reported as a barrier to breaks in the preceding survey (Chapter 4), second only to workload.

Wellbeing sessions and activities were often perceived as inaccessible to doctors. To encourage and facilitate attendance among doctors, these activities should be arranged in conjunction with senior staff to gain their buy-in for juniors. Additional factors to consider include regular sessions hosted at various times of day to accommodate different shift times, activity locations being accessible to different specialties, and whether making a session mandatory might encourage attendance. Moreover, it is important to consider the subject matter: Educational sessions on resilience are quite common in NHS trusts; however, they are often ill-favoured and can foster resentment from attendees who feel misunderstood by their hosts and management. Microbreak activities in the form of visiting therapy dogs were viewed favourably and could solve some of the logistical hurdles of other break activities (e.g. venue distance, lack of time, being accessible for emergencies). Future research could explore the effect of this type of opportunistic activity on doctors' wellbeing, given the success of the microbreak interventions described in the systematic review in Chapter 3 (e.g. Hallbeck et al., 2017; Dorion & Darveau, 2013; Engelmann et al., 2011; see also Albuлесcu et al., 2022 for a meta-analysis on the efficacy of microbreaks for increasing wellbeing in employees and students).

5.4.4 Strengths and limitations

The interview data presented in this chapter fulfils the aim of following up the results of the survey (Chapter 4) and providing a deeper understanding of the results. It does this by 1) describing the factors that affect doctors' intrawork breaks (including many not posed in the survey) and goes beyond the initial aims to show how barriers to break taking interact with each other; 2) exploring how breaks are defined and perceived by doctors, and 3) exploring potential areas for intervention.

This provides a thorough understanding of the myriad of factors, at multiple levels, that influence a doctor's ability to take a break. The strength and importance of this data is in its ability to inform future research and appraise past research, both experimental and epidemiological research. One example of an important finding in this research is that breaks are perceived and defined in different ways by individual doctors. This means that epidemiological methods seeking to understand break-taking prevalence will likely need to specify and define the type of break under investigation. It is possible, therefore, that participants answering the survey questions in Chapter 4 (and the observational studies included in the systematic review in Chapter 3) had different operational definitions of break taking in mind when answering how often they were able to take breaks. Moreover, the interview data was able to uncover a complex, often contradictory, set of circumstances which make up the break-taking landscape and is therefore an integral first step in a) understanding why breaks are infrequent, despite their perceived importance, and b) how we might

feasibly and meaningfully intervene at structural, contextual, and individual levels to improve break-taking practice.

There are some limitations to the data. Efforts to invite and recruit more male participants were not successful and the data represents considerably more female voices (71%). A pre-pandemic meta-analysis found that female trainee doctors were at greater risk for burnout and stress (Zhou et al., 2020), which is consistent with prior reviews (e.g. West, Dyrbye, & Shanafelt, 2018) and help-seeking behaviours. The Practitioner Health Programme (a confidential service for doctors and dentists in England with mental health or addiction problems) reported that women made up three quarters of service users below the age of 35 (Gerada, Jones, & Wessely, 2014). The high prevalence of distress and burnout among female doctors could feasibly motivate greater interest and willingness to participate in a study about doctors' wellbeing.

Similarly, although the views of specialty, core and SAS doctors (senior trainees and middle grade doctors) are represented in the data, no consultants were recruited to the follow-up interviews. Their absence is notable as the free-text survey data (Chapter 4), as well as trainee accounts of their seniors' break-taking behaviour in the interviews, suggests that consultants potentially do not perceive breaks as important or part of their job. Future exploratory research should seek to gather the views of consultants to provide a better understanding of senior staff perspectives, particularly in relation to the barriers they experience at senior level, and the resulting effect and influence of their break practices on the overarching break-taking culture.

5.4.5 Conclusions

The survey in Chapter 4 found that doctors perceived breaks as important to their wellbeing but were frequently unable to take them. The semi-structured follow-up interviews suggest that multiple factors at organisational, procedural and individual levels interact to create complex barriers to break-taking practices. However, doctors are ascribed individual responsibility for taking their breaks. The interview data also provided an understanding of how doctors perceive and define breaks within the work day. Opportunities for intervention were discussed and, as suggested by the survey data, the most important and influential interventions are likely to be the most costly and difficult to implement for trusts (e.g. better staffing). However, there are also some examples of feasible, small-scale interventions that have the potential to meaningfully improve break-taking practice.

Chapter 6 Pandemic Impact Survey

The first phase of data collection explores break taking under typical, pre-pandemic conditions. However, the coronavirus (Covid-19) pandemic outbreak in early 2020 changed the working landscape for healthcare professionals globally. Faced with the threat of overwhelming workload during a time of staff shortages due to illness or isolation, the Covid-19 pandemic represented a significant new threat to the workplace and wellbeing of healthcare professionals. The focus of this thesis needed to be adapted at this point, to address and understand the radically-changed work environments for most healthcare professionals.

As described in Chapter 1, in March 2020, alongside the first UK national lockdown, final-year medical students saw their graduation accelerated so that they could (voluntarily) begin their careers several months earlier to help the NHS in a time of unprecedented need. The 2019-2020 cohort was the first, and only, cohort (thus far) to have their provisional registration brought forward to enable them to join the workforce. Those undertaking the new bridging role between medical graduation in March/April 2020 and the official start of foundation year 1 (FY1) in August 2020 were known as 'interim foundation year' (FiY) doctors. The second phase of this thesis describes the break-taking experiences of this unique cohort of doctors who began their careers at the start of what was then a very novel pandemic with devastating global consequences.

This chapter describes the results of the break-taking survey posed to a cohort of FiY doctors who answered the 'call to serve' on the frontlines of the pandemic. It aims to explore whether a) break-taking frequency, b) the perceived importance of breaks, and c) factors affecting break-taking practice, change under pandemic conditions when compared with pre-pandemic conditions. The data also seeks to explore whether there are differences between these concepts at different temporal stages of the pandemic, comparing the cohort's break-taking experiences as FiY doctors and latterly as FY1 doctors.

6.1 Methods

To investigate break-taking practices of FiY-FY1 doctors during the first year of the Covid-19 pandemic, the survey (Appendix I) and demographic questions (Appendix H) from phase 1 (administered to doctors of all grades) were posed to the 2019/2020 cohort of medical graduates at the University of Southampton. The questions, well received by the 250 participants in the pre-pandemic phase, re-assessed the frequency of missed breaks, barriers and facilitators to break-taking, and the perceived importance of breaks to participants' wellbeing.

Break-taking survey questions formed part of a larger longitudinal study (the 'Called to Serve' project) investigating the wellbeing and workplace experiences of a cohort of doctors who undertook the FiY role and followed them up as they began their FY1 roles. Within the larger project, final-year medical students were surveyed three times, approximately three months apart: 1) mid-April 2020, following their graduation from undergraduate medical training and prior to FiY commencement (a baseline survey, T_0); 2) at the end of July 2020, following the FiY placement (T_1); and 3) early November 2020, three months after they commenced their planned FY1 placement (T_2). Break taking was investigated in the latter two follow-up surveys (see Figure 4 in Chapter 2) as participants had not yet begun working during the baseline (T_0) survey. Therefore, for the purposes of comparison in this body of work, a subset of the data from the pre-pandemic surveys, namely the data from the previous cohort of foundation year (FY) doctors surveyed between September 2019 and early February 2020 (two-to-seven months prior to T_0), was used as an approximation of pre-pandemic break practices in this population. Consequently, the survey data from FY doctors in the first phase of pre-pandemic data collection serves as a baseline measure for this chapter and is referred to as pre-pandemic or phase 1 participants – denoted with $\sim T_0$ where applicable.

Due to restrictions caused by the Covid-19 pandemic, all contact with participants was remote. Initially, the cohort was approached via their online University learning platform (Blackboard) and participants were asked to complete a questionnaire using the iSurvey platform. Announcement reminders were made via Blackboard at regular intervals. During the first survey, participants were asked for their preferred method of contact for completion of the follow-up surveys (telephone and/or email address) as access to the Blackboard site would cease to graduated students before the first follow-up survey (T_1). Prior to completing the iSurvey, an electronic participant information sheet (Appendix N) preceded a list of statements with a tick-box consent (Appendix O). For each survey completed, participants were offered a £5 Amazon voucher.

An ethics application for the larger 'Called to Serve' project, including the surveys described here and the follow-up interviews described in Chapter 6, was approved by the University of Southampton Research Ethics Committee (ERGO number: 56024). All data was pseudo-anonymised and the data spreadsheet and decryption file was password protected.

6.1.1 Data analysis

As in phase 1, demographic data and responses to questions on break frequency, importance, barriers and facilitators were descriptively analysed in SPSS and presented as relative frequencies. Descriptive comparisons were made with pre-pandemic survey data to explore whether pandemic conditions affected the common barriers and facilitators to break taking. Optional open-ended

survey items were less utilized in the electronic format than in the pre-pandemic written form and therefore analysis for recurring themes, alongside their frequencies of occurrence, was not necessary. The comments are described textually.

6.1.1.1 Inferential statistics

As the survey data was measured at ordinal or nominal level, non-parametric tests were used to test differences over time. To investigate whether break-taking frequency differed under pandemic versus pre-pandemic working conditions, Mann-Whitney U tests assessed the differences between the phase 1 FY survey data as a baseline and the two phase 2 data points respectively (i.e. $\sim T_0$ vs T_1 ; $\sim T_0$ vs T_2). This statistical test was appropriate for the data as a) the baseline data was collected from a separate (independent) cohort to the two pandemic survey data points, and b) it allowed for comparisons between the two independent groups with a dependent variable (frequency of missed breaks) measured at ordinal level (e.g. daily, weekly, fortnightly, monthly, never).

The Fisher-Freeman-Halton exact test was used to investigate whether the perceived importance of breaks to wellbeing differs under pandemic versus pre-pandemic working conditions (i.e. $\sim T_0$ vs T_1 ; $\sim T_0$ vs T_2). This is because the data, measured at nominal level ('yes', 'no', 'undecided'), results in 2x3 contingency tables but violates the assumptions of the chi-square test of independence regarding observed and expected cell counts. The Fisher-Freeman-Halton statistic is the most appropriate alternative option to a chi-square test for independent data measured at nominal (or categorical) level with a contingency table greater than a 2x2 matrix (Lydersen, Pradhan, Senchaudhuri, & Laake, 2007).

To investigate whether break-taking frequency and/or importance changes over the course of the pandemic (T_1 vs T_2) Stuart-Maxwell tests (also known as marginal homogeneity tests) were used. The Stuart-Maxwell test is similar to the McNemar test in that it investigates differences between nominal (or ordinal) dependent variables, however it allows for comparisons when a dependent variable has more than two levels, as in the case of break importance to wellbeing (3 levels) and break frequency (5 levels).

6.2 Results

6.2.1 Participant demographics

The break-taking data from FY participants only in the phase 1 survey ($n=93$ FY participants of $N=250$ total doctors of all grades; 37.2% of total phase 1 group) were used as a pre-pandemic baseline ($\sim T_0$) comparison against the pandemic cohort. $N=71$ participants completed the break-taking portion of

the interim pandemic survey (T₁ or Covid-T₁) at the end of their FiY role, and $N=58$ participants also completed the final follow-up survey (T₂ or Covid-T₂) three months after starting their FY1 role.

Table 13 provides a summary of the demographic data across the pre-pandemic and pandemic measurement points. In the pre-pandemic FY sample there was more of an even distribution of male (55.9%) and female (44.1%) participants, whereas the pandemic survey respondents comprised predominantly female participants (~75%) at both Covid-T₁ and Covid-T₂. Pre-pandemic participants also represented a greater range of ethnicities and religious beliefs (47.3% white; 63.6% Christian or no religion), compared with phase 2 participants (Covid-T₁ and Covid-T₂: ~75% white, ~83% Christian or no religion). The median age of participants was 25 at ~T₀ (R: 23-42), and 24 at Covid-T₁ and Covid-T₂ (R: 22-37).

6.2.2 Pandemic impact on perceived importance of breaks

Figure 13 shows the comparison of the perceived importance of breaks to wellbeing between the pre-pandemic, Covid-T₁ and Covid-T₂ time points. Breaks were perceived as important to wellbeing across all time points, with 97.8% of participants responding as such pre-pandemic, 95.8% at T₁ and 93.1% at T₂. Although Covid-T₂ saw a slight change in “yes” responses in favour of “undecided” responses, this was not significant in the Fisher-Freeman-Halton exact tests (pre-pandemic vs Covid-T₁: $p = .762$; pre-pandemic vs Covid-T₂: $p = .107$) and the Stuart-Maxwell test (Covid-T₁ vs Covid-T₂: $p = .157$). Only 1 participant had answered “no” to this question pre-pandemic and none at Covid-T₁ and Covid-T₂.

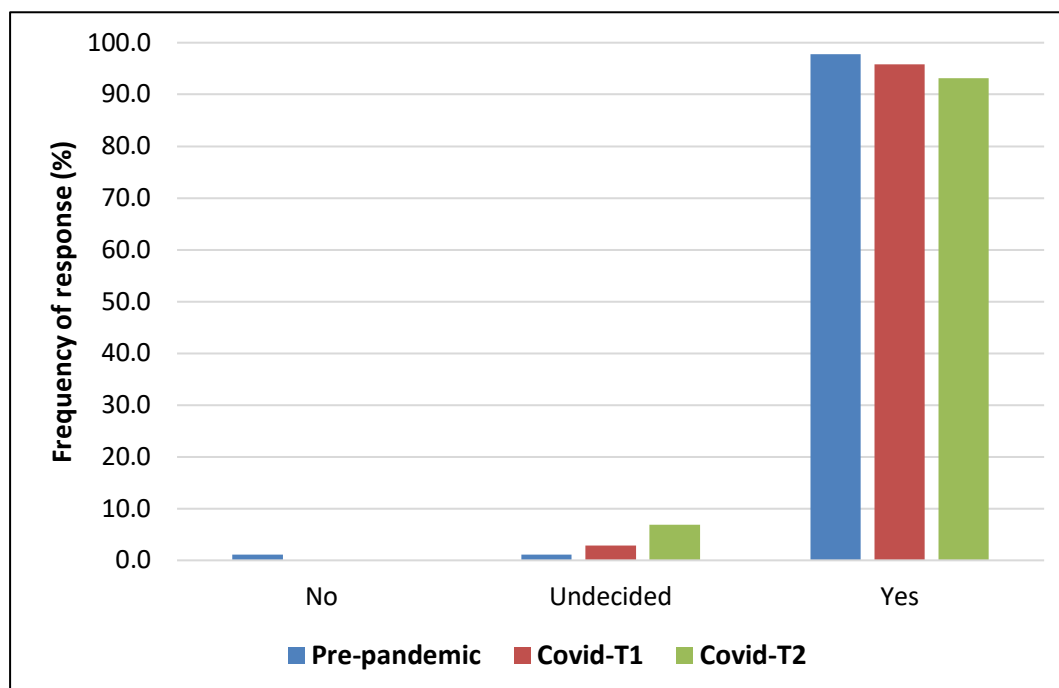


Figure 13 Perceived importance of breaks at pre-pandemic, Covid-T₁ and Covid-T₂ time points

Table 13 Demographic characteristics of phase 2 survey participants

		Pre-pandemic Sep 2019-Feb 2020 n (%)	Covid-T₁ Apr 2020 n (%)	Covid-T₂ Nov 2020 n (%)
Gender				
	Female	41 (44.1)	54 (76.1)	43 (74.1)
	Male	52 (55.9)	16 (22.5)	14 (24.1)
	Prefer not to say	-	1 (1.4)	1 (1.7)
Age				
	24 and under	21 (22.6)	40 (56.3)	33 (56.9)
	25 to 29	51 (54.8)	25 (35.2)	20 (34.5)
	30 to 34	11 (11.8)	3 (4.2)	2 (3.4)
	35 and over	6 (6.5)	3 (4.2)	3 (5.1)
Ethnicity				
	White (British, Irish and other)	44 (47.3)	53 (74.6)	44 (75.9)
	Asian or Asian British	31 (33.3)	13 (18.3)	11 (19.0)
	Black or Black British	7 (7.5)	1 (1.4)	1 (1.7)
	Arab or Arab British	5 (5.4)	-	-
	Mixed	4 (4.3)	3 (4.2)	1 (1.7)
	Prefer not to say	2 (2.2)	1 (1.4)	1 (1.7)
Religion				
	No religion	35 (37.6)	39 (54.9)	29 (50)
	Christian	27 (29.0)	20 (28.2)	19 (32.8)
	Hindu	13 (14.0)	2 (2.8)	1 (1.7)
	Muslim	12 (12.9)	4 (5.6)	4 (6.9)
	Jewish	-	2 (2.8)	2 (3.4)
	Other	-	2 (2.8)	1 (1.7)
	Prefer not to say	5 (5.4)	2 (2.8)	2 (3.4)
Specialty				
	Intensive care medicine	4 (4.3)	-	-
	Clinical oncology	4 (4.3)	-	-
	Dental	1 (1.1)	-	-
	Emergency medicine	9 (9.7)	2 (2.8)	2 (3.4)
	General medicine	32 (34.7)	44 (62.0)	25 (43.1)
	Obstetrics & gynaecology	3 (3.2)	1 (1.4)	1 (1.7)
	Paediatrics	2 (2.2)	2 (2.8)	3 (5.2)
	Pathology	1 (1.1)	1 (1.4)	-
	Psychiatry	8 (8.6)	2 (2.8)	4 (6.9)
	Surgery	29 (31.4)	18 (25.4)	22 (37.9)
	Did not state	-	-	1 (1.7)
	Total	93	71	58

6.2.3 Pandemic impact on frequency of missed breaks

Figure 14 shows the break-skipping data at Covid-T₁, Covid-T₂ and among pre-pandemic FY doctors. The pre-pandemic data demonstrate a linear trend with regard to missed breaks, where most doctors missed their breaks on a daily or weekly basis (combined 80.6% of participants) and a minority (combined 15.1%) missed their breaks only fortnightly, monthly or never (i.e. were able to take breaks almost daily). Pandemic measurements at Covid-T₁ and Covid-T₂ demonstrate a similar linear trend to pre-pandemic data: the majority of participants missed their breaks on a daily or weekly basis (Covid-T₁: combined 67.6% of participants; Covid-T₂: combined 75.9%) and the minority (Covid-T₁: combined 31%; Covid-T₂: combined 22.4%) missed their breaks only fortnightly, monthly or never. However, unlike pre-pandemic data or Covid-T₂, the data is skewed at Covid-T₁ such that the most common practice was skipping breaks twice weekly or weekly instead of daily or twice daily and considerably more participants were missing their breaks fortnightly, monthly or never (i.e. more participants were taking breaks almost daily).

A Mann-Whitney U test comparing pre-pandemic and Covid-T₁ data showed a significant difference, $U = 2315.0$, $p = .003$, with breaks being missed more frequently pre-pandemic than at Covid-T₁. However, there was no significant difference between pre-pandemic and Covid-T₂ data, $U = 2309.0$, $p = .324$. Comparing break-taking across the course of the pandemic in the FiY cohort, a Stuart-Maxwell test showed a significant difference between the frequency of missed breaks at Covid-T₁ and Covid-T₂, $p = .025$ with breaks being missed more frequently at Covid-T₂ than Covid-T₁.

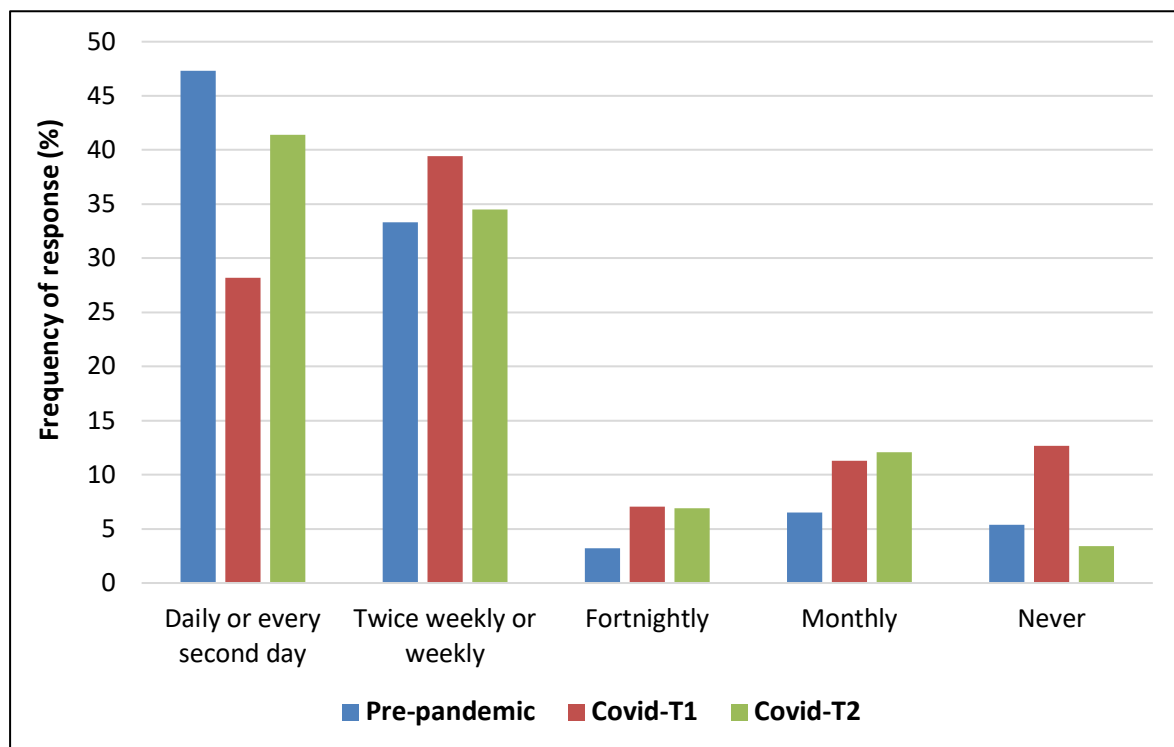


Figure 14 Frequency of missed breaks at pre-pandemic, Covid-T₁ and Covid-T₂ time points

6.2.4 Pandemic impact on barriers to break taking

Figure 15 shows the frequency of participant responses regarding barriers to taking breaks, while Figure 16 compares the rank order of barriers, at the three time points. The rank order of pre-pandemic ($\sim T_0$) barriers did not change when selecting for FY data only (N=93/250; 37.2%). Across all time points, the top and bottom ranked barriers were the same: Workload remained the most commonly cited barrier to taking breaks at all time points and lack of break facilities or infrastructure remained the least cited barrier. Staffing levels also remained in the top 3 over time. The ranking of other barriers vary over time, with pre-pandemic and Covid-T₂ rankings being most similar.

Open-text data regarding additional barriers to breaks at Covid-T₁ included: Long ward rounds and an inability to work as fast as others. At Covid-T₂ no additional barriers were identified.

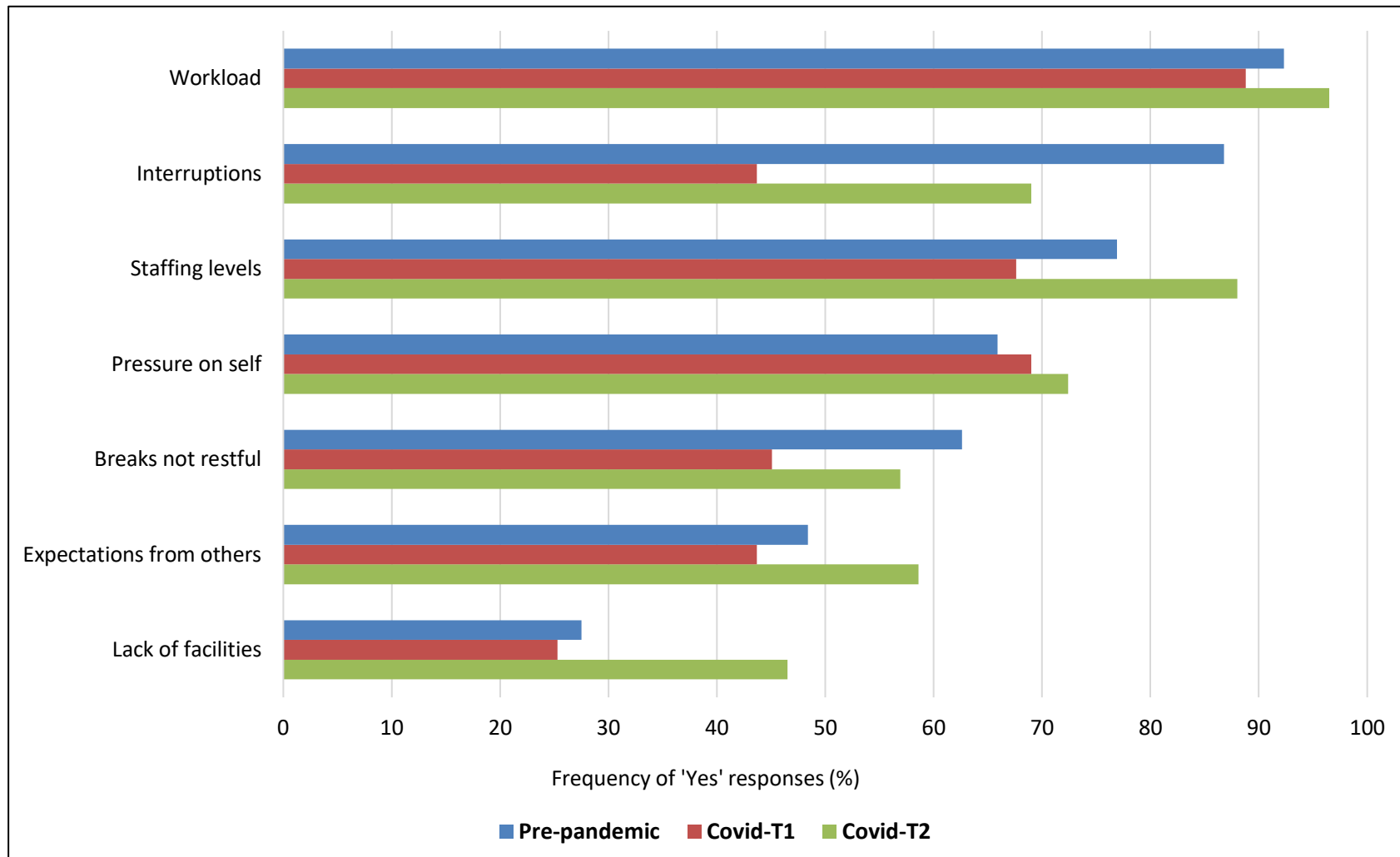


Figure 15 Ratings of barriers to break taking at pre-pandemic, Covid-T₁ and Covid-T₂ time points. Proportion of participants identifying factor as a barrier to breaks

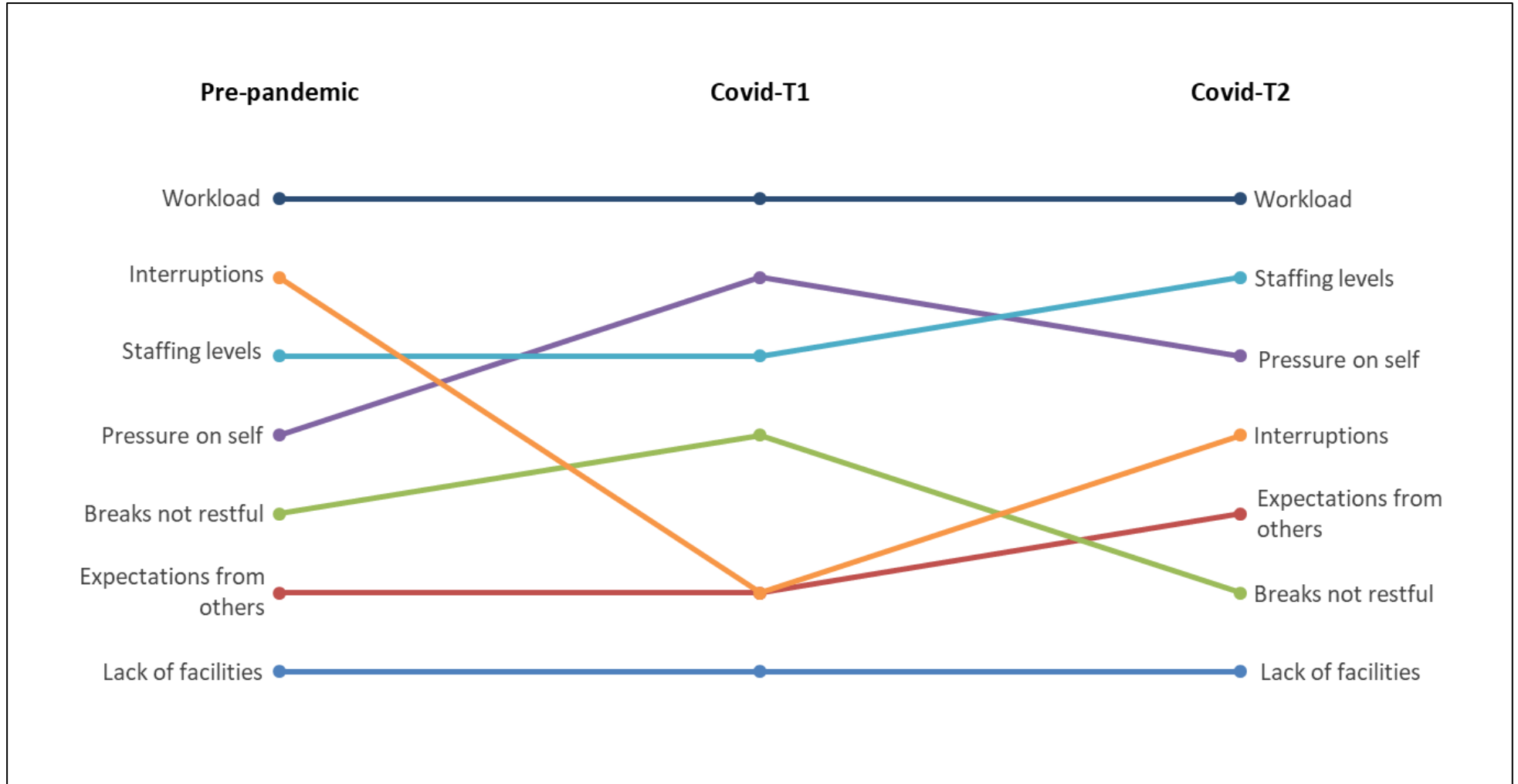


Figure 16 Comparison of break barrier rankings at pre-pandemic, Covid-T₁ and Covid-T₂ time points. Ranking is by the total number of participants identifying the category as a barrier to break taking at each time point, from most (top) to least (bottom).

6.2.5 Pandemic impact on facilitators of break taking

The rankings of potential break facilitators across all doctor grades (see Figure 10 in Chapter 4) altered slightly when limiting the sample to FY doctors only (N=93/250; 37.2%): 'Handing over the bleep' became the most likely potential facilitator to improve break taking, where it was once 4th. All other categories remained in the same positions in relation to one another.

Figure 17 shows the frequency of participant responses to potential break-taking facilitators, while Figure 18 shows a comparison of facilitator rankings at each time point. At all time points there is a clear and equal split of five most likely and five least likely potential interventions to facilitate break taking. Of the list of facilitators, adequate cover, senior encouragement, task delegation, handing over bleeps, and mandatory breaks were the most likely to improve break taking. The least likely to have an impact, at all time points, were improving rest facilities, team building, break activities, understanding the effect of missed breaks on patient outcomes, and reminders to take breaks.

At both Covid-T₁ and Covid-T₂, open-text comments by two different participants stated a preference to leave on time rather than take a break as there is insufficient staff to achieve both. At Covid-T₂ an additional suggestion was to allow staff to leave hospital grounds for breaks

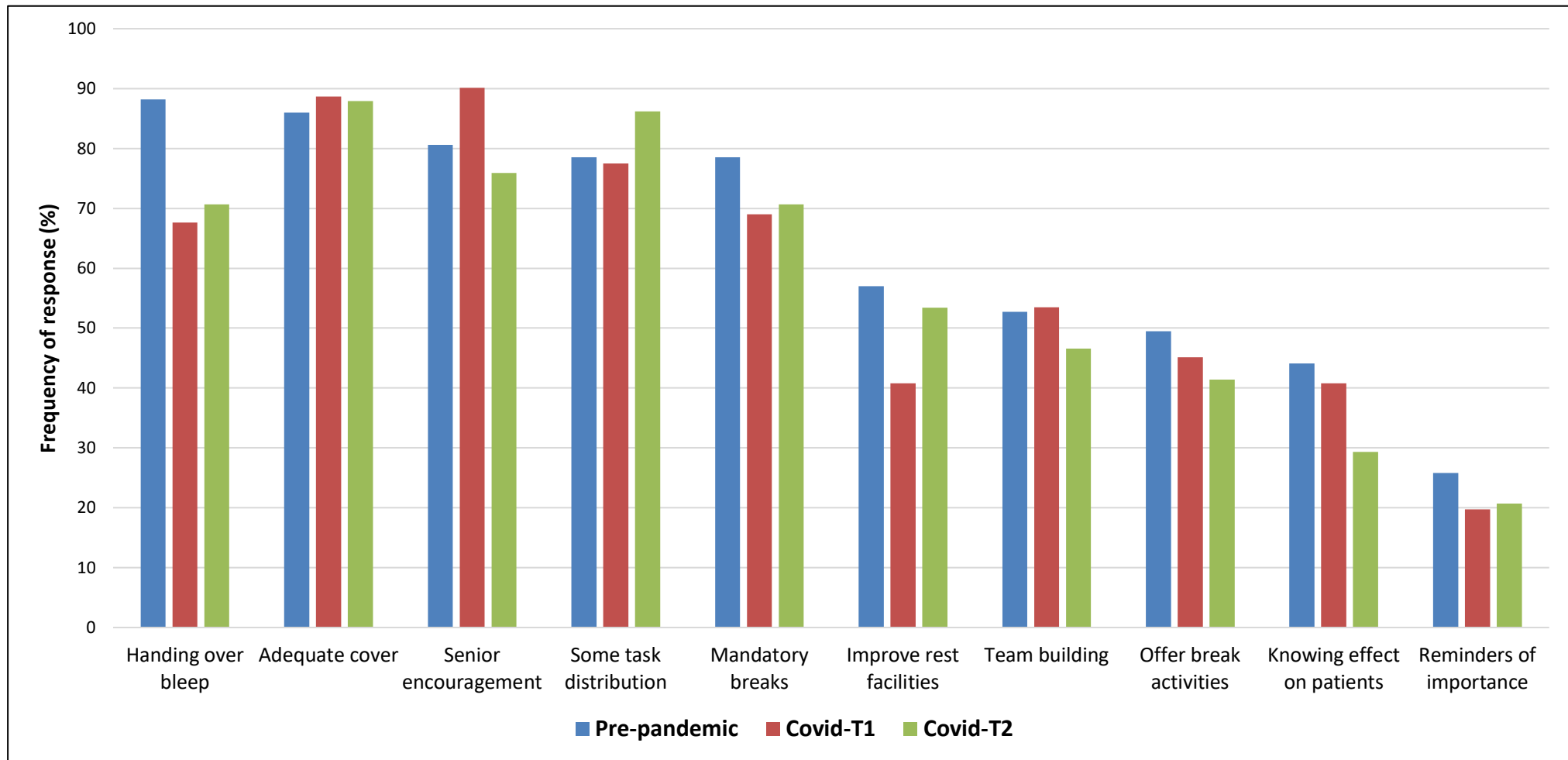


Figure 17 Ratings of potential break facilitators at pre-pandemic, Covid-T₁ and Covid-T₂ time points. Proportion of participants rating the options as more likely to improve break taking.

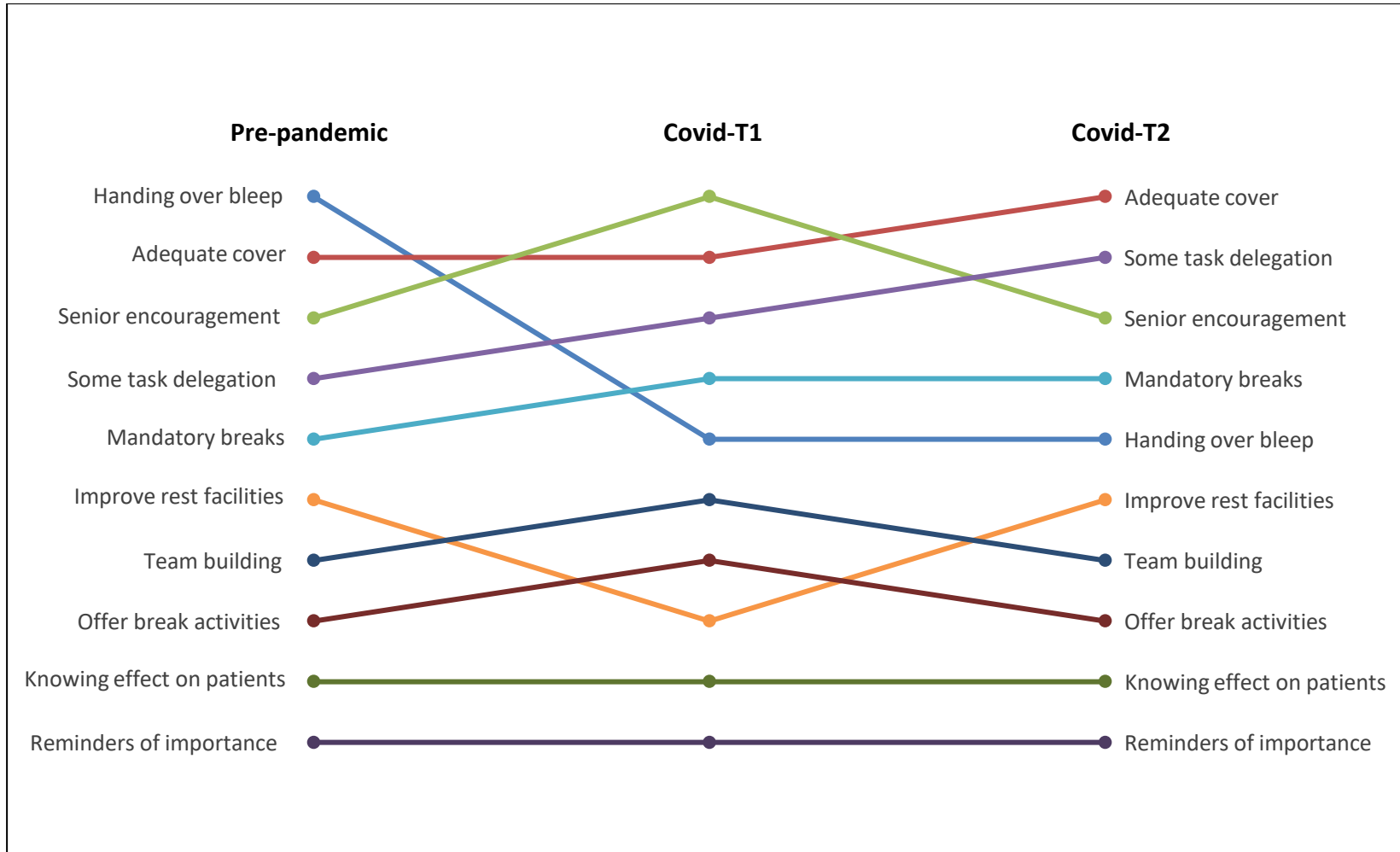


Figure 18 Comparison of break facilitator rankings at pre-pandemic, Covid-T₁ and Covid-T₂ time points. Ranking is by the total number of FY participants selecting 'more likely to improve break taking' at each time point, from most (top) to least (bottom).

6.3 Discussion

The perceived importance of breaks to wellbeing was relatively unchanged by the pandemic. One might have hypothesized that break importance would increase during the pandemic, due to the increased strain on healthcare providers. There was instead a slight reduction at Covid-T₂ (97.8% pre-pandemic vs 93.1% at Covid-T₂), when a small number of respondents were 'undecided'. However, this change was not significant and the perception of break importance remained very high in all surveys, both before and during the pandemic. Although one participant had indicated otherwise in the pre-pandemic sample, no phase 2 participants opposed their importance to wellbeing at Covid-T₁ or Covid-T₂ (i.e. answered that they were not important to wellbeing).

Like the pre-pandemic cohort, breaks were still frequently missed (on a daily or weekly basis) over the course of the pandemic. However, break-taking frequency initially improved for foundation year doctors (at Covid-T₁) before returning to similar pre-pandemic levels (at Covid-T₂). Both the pre-pandemic and Covid-T₂ data were collected at similar times of the year, autumn/winter, whereas Covid-T₁ data were collected in summer. In a typical (non-pandemic) year, there are expected fluctuations in patient load over the course of the year, with a significant increase in admissions for cardiovascular and respiratory conditions over winter (Scobie, 2018; Walker, Van Woerden, Kiparoglou, & Yang, 2016). Consequently, in a typical (non-pandemic) year, we might expect more opportunities for breaks in summer and comparatively less breaks to be taken in winter, alongside higher workloads. The common trend of more respiratory illnesses circulating in winter is supported by Covid-19 case rate data at the time. Figure 19 shows the timing of survey data collection in the context of Covid-19 case rates, hospitalisations, and deaths in England over 2020. From the graph it is clear that Covid-19 cases declined significantly over summer 2020, when the first pandemic impact survey (Covid-T₁) was administered and showed comparatively more successful break taking. Cases began to rise sharply in the autumn, culminating in the second wave (or surge) of infections and the second national lockdown in early November 2020. The second pandemic survey (Covid-T₂) coincided with the second lockdown and showed significantly greater levels of missed breaks. It is therefore likely that the effect of seasonal and pandemic surge-related pressures was reflected in the data, with a subsequent impact on workload and opportunities for breaks.

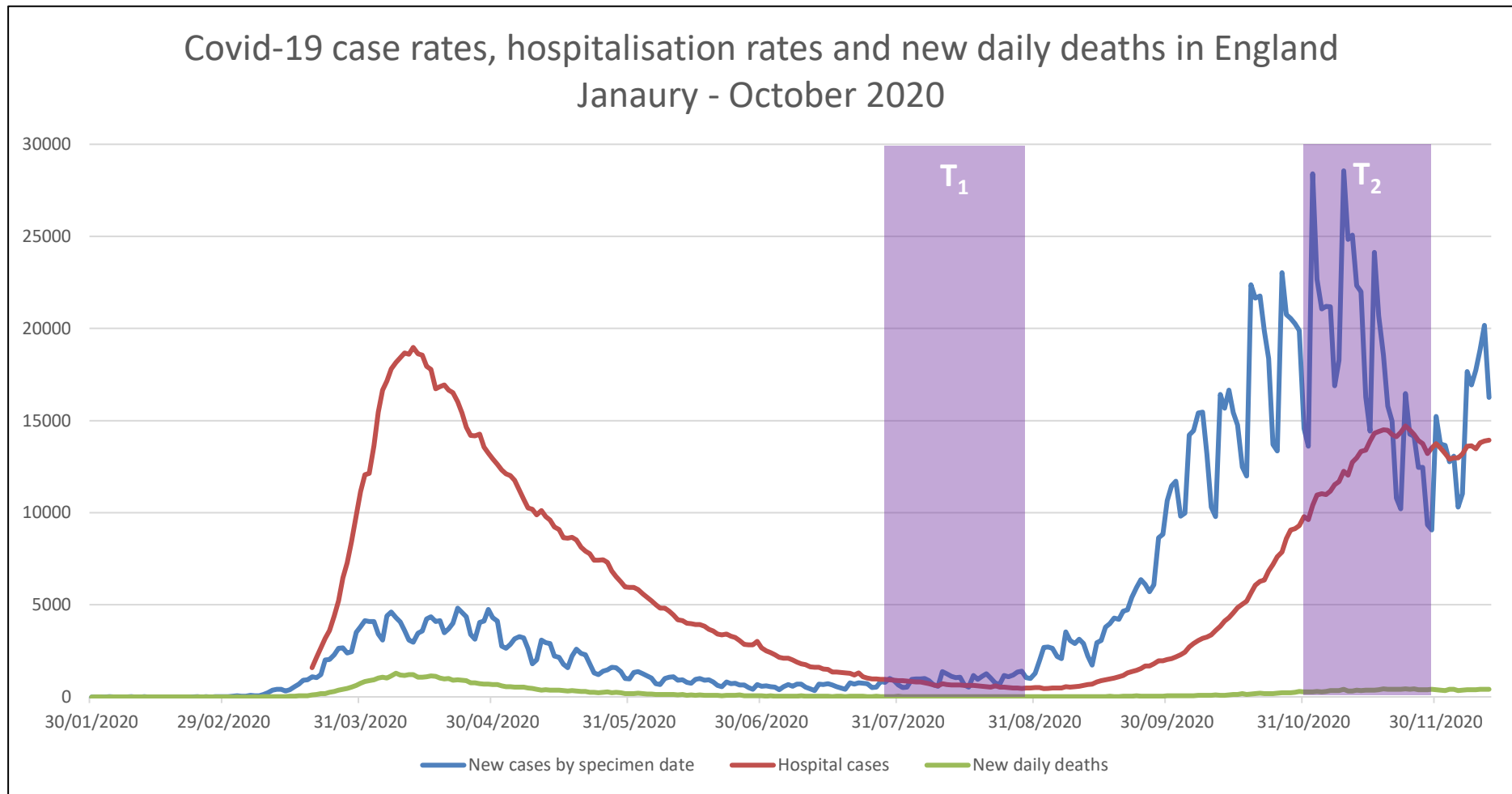


Figure 19 Timing of pandemic survey data collection alongside Covid-19 case rates, hospitalisations, and new daily deaths in England (January to December 2020) (UK Health Security Agency, 2020)

This is also consistent with findings from the GMC barometer surveys in 2019, 2020 and 2021 (GMC, 2021a): In the 2020 summer (June/July) survey, after the first pandemic surge, fewer doctors (15%) reported that they were struggling with workload (not coping with the amount of work and working beyond contracted hours) than in the previous year (2019: 26%) and subsequent year (2021: 26%). A considerably greater proportion (51%) of doctors in summer 2020 were managing their workload compared with 2019 (29%) and 2021 (35%).

The notion of seasonal or surge-related pressures being intertwined with break taking is further supported by the participants' ranking of barriers to break taking: Across all time points, pre- and post-outbreak, workload remained the most common barrier to breaks. It is therefore reasonable to assume that any factor(s) affecting workload will affect break-taking frequency and therefore break-taking opportunities are likely to fluctuate over time in parallel with workload.

The importance of workload to break-taking practices is further reinforced by participants' perceptions of break facilitators. A clear split is seen between the top and bottom five facilitator ratings across the pre- and intra-pandemic measurements. While given slightly different priority at different time points, participants consistently perceived the facilitators which temporarily alleviate workload to free up time for breaks (e.g. adequate cover, delegating tasks, handing over bleeps) as the most likely to improve break taking. Permissive factors (those that explicitly give doctors permission to take breaks), such as senior encouragement and making breaks mandatory, were also highly rated at all time points. Similar to the pre-pandemic data from doctors of all grades (Chapter 4), the five interventions rated least likely to facilitate break taking included rest facility improvement, team building/break-time activities, reminders to take breaks, and understanding the effect of breaks on patient outcomes.

The interventions that were ranked highest for their likelihood to facilitate more breaks are those that are potentially the most complex and costly to implement. Conversely, the bottom five ranked categories are often those areas where interventions are implemented, despite participants rating them the least likely to make a difference. This is likely because they are comparatively less complex and costly than the most consistently popular categories: hiring more staff to a) accommodate sufficient cover and/or b) reduce workloads through task delegation. The often middle-rated categories (making breaks mandatory and handing over bleeps) are also likely dependent on workload and staff. The options favoured by trusts and management for interventions (such as resilience or self-care training, reminders to take breaks) are least favoured by doctors and tend to place the onus on the individual instead of the system, echoing the results of the pre-pandemic interviews in Chapter 5.

Given the consistent lack of confidence in rest facility improvement as a meaningful break facilitator, it is not surprising that lack of break facilities was also repeatedly ranked the least common barrier to break taking, under typical and pandemic conditions. Nevertheless, as described in Chapter 4, break facilities are a common topic of conversation and intervention to improve doctors' break-taking practice (e.g. Tonkin, 2019; Tonkin, 2020). At the height of the pandemic, for example, several NHS trusts created spaces called 'wobble rooms', designed to allow staff an escape from the overwhelming presence of the virus (Rimmer, 2020). Some contained food and drink, others had rules on the content of conversations (i.e. no 'shop talk'). However, as described in Chapter 5, these types of interventions are only useful insofar as doctors can access them amid their workload and competing priorities. As a comparatively feasible and tangible intervention, investment in facilities allows trusts to demonstrate their commitment to improving doctors' wellbeing by removing the more apparent physical barriers within the work environment. With a lack of research on the topic of break taking, it is understandable that solutions to date have been sought in the more visible, quantifiable, and achievable factors associated with intrawork breaks. However, this data demonstrates the importance of the involvement of doctors in co-designing break-taking interventions for their benefit, as well as the importance of wider system-level reforms.

6.3.1 Strengths and limitations

The data provide an understanding of a cohort of newly qualified doctors' break-taking practices and perceptions in the first 6 months of their medical careers during the Covid-19 outbreak. Using a longitudinal method and taking measurements at two different time points, it allows for a degree of comparison across the course of the pandemic, instead of a single cross-sectional measurement. The use of pre-pandemic baseline data, collected from the previous year's cohort of FY doctors, allows for further comparison between non-pandemic and pandemic conditions.

With multiple measurement points, the data on break-taking prevalence suggested a pattern where pre-pandemic and post-outbreak data were similar at the same time of the year – winter pressures seemed to have a similar degree of detriment to break-taking frequency both before and after the pandemic outbreak. This suggests that there is a strong correlation between workload and break-taking proficiency, which might explain the presence of workload as the most frequently cited barrier to breaks across all quantitative surveys (pre- and post-pandemic outbreak), and its importance in the pre-pandemic qualitative interview data. This finding provides valuable new insights into the importance of research accounting for the effect of seasonal (or pandemic surge) pressures on the ability to take breaks. For example, research comparing break-taking interventions should be undertaken at similar times of year or in similar periods of clinical demand.

Additionally, as described in Chapter 1 (see Figure 2), the BMA's Covid-19 tracker surveys (2021a) indicated an increase in doctors experiencing mental health difficulties over the winter 2020/21 period (October 2020-February 2021) during the UK's second Covid-19 wave, when this study found more infrequent break taking, than the 2020 summer when Covid-19 case rates decreased and this study found more frequent break taking. This suggests that at the same time that workload increased, there was a potential association, with break-taking frequency and wellbeing outcomes being negatively affected. However, among many other differences, the BMA's tracker surveys involved a significantly greater proportion of UK doctors of all grades, while this survey included only FY doctors, and therefore it is difficult to make comparisons and conclusions. It would be useful for future research to directly measure the relationship between workload, wellbeing, and break taking in the same sample of doctors.

In addition to similarities in (seasonal) break-taking prevalence, there was considerable overlap in participant responses regarding the importance (or unimportance) of certain barriers and facilitators. The overall similarity of responses before and during the pandemic strengthens the worth of pre-pandemic break-taking data to current and future pandemic conditions, such that: 1) research on break taking prior to (or outside of) the Covid-19 outbreak can be used to inform break-taking policy and practice during the pandemic or other times of unusually high workload, and 2) interventions which are planned and implemented with the intended recipients are more likely to be cost effective, responsive, and gain better satisfaction and outcomes from users. Co-produced interventions are therefore more likely to remain beneficial under different circumstances (National Collaborating Centre for Mental Health, 2019).

There is a limitation to these interpretations, however, as the measurement of break-taking practice in the summer does not have a corresponding pre-pandemic summer comparator. The data are therefore unable to determine whether break-taking practice and experiences of foundation year doctors in the 2020 summer period was similar to summers in previous years.

There are several other methodological limitations. To provide a like-for-like comparison with the pre-pandemic data, the study-specific Likert-type questions were repeated to assess break practices. This means that the limitations of this method acknowledged previously in Chapter 4 (see 4.3.1) are also present here. Additionally, this sample of doctors had not yet begun working until the pandemic outbreak. Therefore, to obtain a comparable pre-pandemic baseline it was necessary to use data from the previous cohort of foundation doctors. This introduces potential confounders as the results can be affected by factors that are unique to each cohort or time point, not simply the Covid-19 outbreak. For example, the pre-pandemic survey was predominantly administered in person during group training sessions whereas this was not possible under pandemic conditions. The experience of

completing a survey with pen and paper in a group setting in person (with opportunities to ask questions of the researcher if necessary) compared with the experience of completing the same survey virtually in isolation could feasibly affect the results, especially as the questions relate to personal opinions and experiences and are highly subjective. Additionally, the survey conducted with the pre-pandemic sample included doctors working in Hampshire only, whereas the sample of doctors surveyed during the pandemic were located across the UK. The pandemic sample also comprised predominantly white, female participants of Christian faith or no religion, compared with a more representative sample in the pre-pandemic cohort. This might be explained by research suggesting that men are less likely to participate in online survey research than women (Smith, 2008) and further research suggesting that female trainee doctors demonstrated higher levels of anxiety and adverse mental health during the pandemic (Dunning et al., 2022). It is possible therefore that this motivated the self-selection for participation in a survey about wellbeing. Nevertheless, this survey achieved its aim as an exploratory exercise that sought to describe the intrawork break-taking practices and experiences of the first (interim) foundation year cohort beginning their careers during the Covid-19 pandemic. It provides an observational comparison with data from the previous pre-pandemic FY cohort (Chapter 4) and can be used to inform future experimental research.

6.3.2 Conclusions

There were many similarities between the break-taking data of foundation doctors who began their careers during the Covid-19 pandemic and the pre-pandemic foundation trainees (Chapter 4). Like pre-pandemic cohort of FY doctors, the 2020 FiY-FY1 cohort perceived breaks as important to their wellbeing across the first 6 months of the pandemic. Comparison of data on missed breaks from the pre-pandemic and pandemic cohort suggests an important effect of seasonal pressures on break-taking frequency, under typical and pandemic conditions. Across the two pandemic measurements and one pre-pandemic measurement, workload remained the most frequently cited barrier to breaks. Accordingly, interventions which address workload (e.g. hiring more staff for adequate cover, delegation of work tasks, handing over bleeps) always featured in the top five potential break facilitators, alongside two permissive factors: senior encouragement and making breaks mandatory. The facilitators rated least likely to make a difference to break taking, at all time points, were rest facility improvement, team building, break activities (e.g. mindfulness, yoga), education on the effect of missed breaks, and reminders to take breaks. However, these remain the most popular choices for interventions, both before and during the pandemic. This suggests that planning and decision-making regarding break-taking policy and interventions would benefit from involving the intended beneficiaries (doctors) to ensure their usefulness. The following chapter describes interview data

Chapter 6

which delves deeper into the experiences and perceptions of the cohort of FiY-FY1 doctors during the pandemic and provides further comparison with the narratives of pre-pandemic participants.

Chapter 7 Pandemic Impact Interviews

The pandemic impact survey with FiY doctors (Chapter 6) provided quantitative data and rankings of barriers and facilitators to break taking that were broadly similar to pre-pandemic findings. This is a useful starting point for organisational and procedural decision making on the potential means to improve break-taking practice. However, as demonstrated by the pre-pandemic findings (Chapter 5), interviews provide a more comprehensive understanding of the many factors that affect break taking and how they interact with one another. Given the vast global disruption caused by the pandemic, and the threat it posed to junior doctors and foundation level (FiY) doctors in particular (see 1.3), it is important to explore junior doctors' qualitative experience of the pandemic.

Chapter 5 described the structural, procedural, and individual factors that junior doctors described as significant to their break-taking practices under typical, pre-pandemic conditions (see Figure 12). This chapter will seek to explore if, or how, the pandemic impacted junior doctors' workplace experiences by investigating whether there were changes to (or similarities with) the pre-pandemic interview narratives. Chapter 5 established the link between various structural, procedural and individual factors and their effect on break-taking practices and experiences. This chapter will explore the challenges the pandemic posed to break-taking practice as well as the overall changes experienced in the workplace, with the acknowledgement that disruption to these factors and the wider working environment (the 'landscape' in which breaks are taken) will both directly and indirectly affect break-taking practice or the need for breaks and rest.

The pandemic impact surveys (Chapter 6) showed some differences in FiY doctors' break-taking frequency as well as the ranking of facilitators and barriers to break taking at different time points over the course of the first year of the pandemic. This suggests there could be a temporal component to workplace and break-taking experiences during the pandemic. Some of the phase 1 interviews with junior doctors of all training grades were conducted early in the Covid-19 outbreak, representing a different temporal perspective from the FiY-FY1 cohort who were recruited almost a year later. This chapter combines the experiences of these two groups of junior doctors to provide a thorough understanding of different perspectives and experiences of the pandemic.

Prior to these interviews there was an awareness that some (publicised) efforts were made to facilitate breaks or spaces for self-care under the challenging circumstances (e.g. the creation of 'wobble' rooms; Rimmer, 2020). However, the pre-pandemic interviews showed that the form these gestures take is important to determining whether doctors are able to engage with them or whether they affect meaningful change for doctors' break practices. The interviews therefore allow for a more thorough understanding of workplace interventions or areas for improvement that doctors found (or

would have found) useful in the context of pandemic pressures and how they should be delivered to maximise effectiveness and uptake.

7.1 Methods

7.1.1 Phase 1 participants

Twelve of the interviews conducted with doctors of all grades in phase 1 coincided with the first Covid-19 outbreak in the UK, including the first two weeks of restrictions within hospitals and the first national lockdown (see Figure 3) in March 2020. These participants described both pre-pandemic and post-pandemic outbreak experiences. As a result, the phase 1 interview data were divided: data relating to typical pre-pandemic conditions described by all ($N=21$ total) phase 1 interviewees are presented in Chapter 5. The data in phase 1 interviews that related to the Covid-19 pandemic ($N=12$) were extracted, analysed together with phase 2 data, and presented in this chapter. These data, describing the impact of the initial outbreak, were collected from doctors in a range of grades and specialties (see Table 14 for participant demographics; see Chapter 5 for recruitment methods and procedure).

7.1.2 Phase 2 participants

Following the final follow-up survey of the newly-qualified FY1 doctors (see Chapter 6), semi-structured individual interviews ($N=9$) were undertaken between February and March 2021 to understand the cohorts' experiences in the 10 to 11 months following graduation, while working through the Covid-19 pandemic as interim foundation year (FiY) and subsequently foundation year one (FY1) doctors.

Participation was offered to participants who completed the Covid-T₂ follow-up survey in November 2020 and consented to being contacted for this purpose. As in phase 1 interviews, a maximum variation purposeful sampling method was intended. Participants from a range of ethnic and religious backgrounds were invited to take part in the interviews first, before offering participation to other eligible participants, to capture a range of experiences that could have occurred in the ten months post-graduation (April 2020 to January 2021).

Due to the ongoing Covid-19 restrictions and because some participants had relocated from the Southampton area after graduation, interviews were conducted via telephone (or video conferencing) to facilitate participation, based on the success of this method in phase 1 (see 5.1). Transcription was completed alongside interviews and recruitment continued until saturation was

reached and no new data was yielded, involving a process of iterative data collection and preliminary analysis.

Prior to telephone/video call interviews, participants were sent the participant information sheet (Appendix P). Recorded interviews started with the confirmation that they had read the participant information sheet and were aware that the interview was being recorded. The researcher read out the statements in the interview consent form (Appendix Q) to participants, who were asked to verbally confirm their agreement with the statements and their consent to participate in the interview. As compensation for their time, participants received a £10 Amazon voucher upon completion of the interview.

In addition to direct questions about break taking, the interview topic guide (Appendix R) included questions about how the pandemic affected working conditions and/or how their experience differed from what they envisaged prior to the Covid-19 outbreak. This provided an understanding of the context for participants' break-taking practice. As interviews were an opportunity for participants to recount their own experiences, the researcher was guided by participants' pacing and topics of interest. The topic guide questions were used as a framework for potential areas to discuss further, where necessary.

7.1.3 Participant demographics

Table 14 shows the demographic data for phase 1 and phase 2 participants. The data represent a range of experiences across specialties, grades, ethnicities, and religious beliefs. The early pandemic phase 1 data represents the views of both male (33%) and female (67%) participants. Following the pattern of phase 2 survey recruitment, the phase 2 interview data represent predominantly (89%) female participant experiences.

7.1.4 Data analysis

Following transcription, a deductive thematic analysis of interview data was undertaken: themes were formed iteratively and responses were assessed for their similarities to, and deviations from, the themes derived in phase 1 to provide a comparison of pre-pandemic and post-outbreak workplace and break-taking experiences. As in Chapter 5, extracts and quotes from interviews are presented both as standalone excerpts and as embellishments to the narrative.

The pandemic interview data from phase 1 and phase 2 are not presented separately for brevity as, despite the temporal difference between the interviews, the narratives and themes were similar across both groups of participants working during the pandemic. However, to provide context for

readers and indicate which phase a participant was recruited in, quotes from the FiY-FY1 cohort are attributed with a 'C' before their participant identifier number, to indicate their participation in the Called to Serve FiY cohort study.

7.2 Results

Guided by participants' narratives and priorities during the interviews, the data in this chapter reflect participants' experiences of change and disruption in the workplace as a result of the pandemic outbreak. To remain true to participants' narratives during this time, the analysis includes themes and subthemes that *directly* affected break-taking practice, as in Chapter 5, as well as other structural, procedural or individual-level factors that *indirectly* affected break-taking practice by modifying participants' roles and responsibilities, work environment, workload, opportunities for breaks, the number of competing priorities, worries and concerns, and/or the resulting need for rest and recovery due to the cumulative effects of disruption at multiple levels.

In Chapter 5, pre-pandemic participants (junior doctors of all grades) described the 1) structures and contexts, 2) processes and team level factors, and 3) individual factors that had an effect on their break-taking practices (see Figure 12). Given the wide-ranging effects of the Covid-19 pandemic globally, it is not surprising that the junior doctors interviewed in this chapter described a disruptive impact on most of these factors.

Figure 20 shows the summary of main themes and subthemes derived by the thematic analysis. Compared with Figure 12, which summarised the pre-pandemic interview themes, the pandemic data saw the individual removed from the cyclical figure and depicted as a hand whose function was to cope with the weight of structural and procedural changes, unidirectionally, rather than also exerting an influence on them. Structures and processes remain as intrinsically linked factors, with some overlap between them and a significant effect on one another. As with the pre-pandemic data, the themes and subthemes can, and often do, overlap but are reported separately in this chapter for clarity.

Table 14 Demographic characteristics of participants interviewed under pandemic conditions

		Phase 1 early Covid participants n (%)	Phase 2 FY1 cohort participants n (%)
Gender			
	Female	8 (66.7)	8 (88.9)
	Male	4 (33.3)	1 (11.1)
Age			
	24 and under	1 (8.3)	5 (55.6)
	25 to 29	7 (58.3)	4 (44.4)
	30 to 34	1 (8.3)	-
	35 to 39	3 (25.0)	-
Ethnicity			
	White	7 (58.3)	6 (66.7)
	Asian or Asian British	3 (25.0)	2 (22.2)
	Chinese	1 (8.3)	1 (11.1)
	Mixed	1 (8.3)	-
Religion			
	No religion	6 (50.0)	3 (33.3)
	Christian	2 (16.7)	4 (44.4)
	Hindu	2 (16.7)	2 (22.2)
	Prefer not to say	2 (16.7)	-
Grade			
	Foundation trainee	6 (50.0)	9 (100.0)
	Core trainee	2 (16.7)	-
	Specialty trainee, registrar	3 (25.0)	-
	Specialty, associate specialist	1 (8.3)	-
Specialty			
	Emergency	3 (25.0)	-
	Psychiatry	3 (25.0)	2 (22.2)
	Surgery	1 (8.3)	3 (33.3)
	Trauma and orthopaedics	1 (8.3)	1 (11.1)
	ENT	1 (8.3)	-
	Haematology	2 (16.7)	-
	Oncology	1 (8.3)	-
	Acute medicine	-	1 (11.1)
	Respiratory	-	2 (22.2)

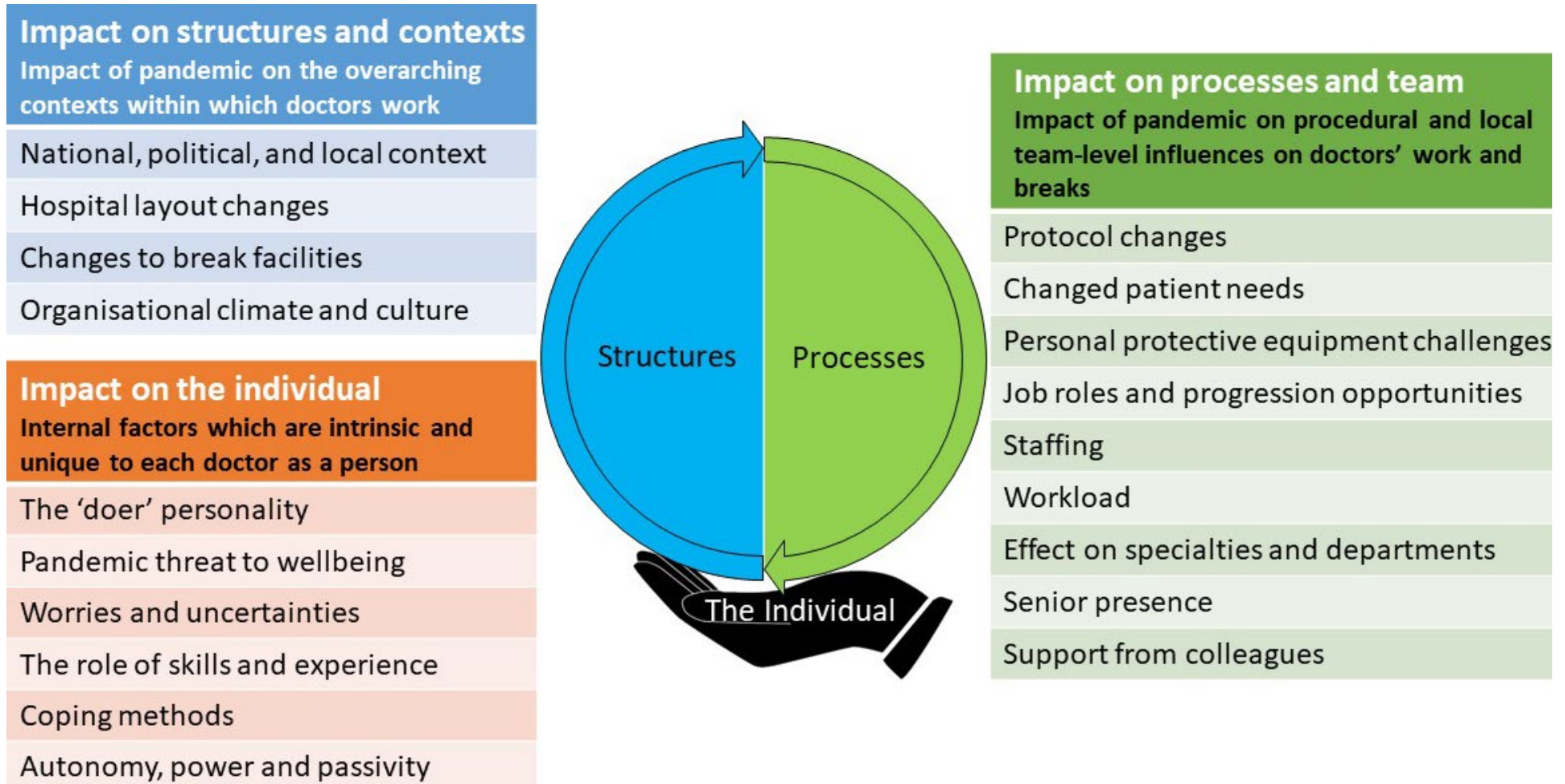


Figure 20 Pandemic interview themes: The influence of the pandemic on factors affecting break taking

7.2.1 Pandemic impact on structures and contexts

Pre-pandemic phase 1 participants described the structures within which they work, under typical working conditions, and the associated effect these have on break-taking practices. During the pandemic participants described many, major structural and contextual changes that drastically affected work (and home) environments. Organisations (trusts, hospitals, departments) had to unavoidably respond to and enact many of the upstream decisions with changes to physical structures, departmental arrangements, and broad organisational cultural contexts. This drastically changed the physical, cultural, and procedural landscape within which intrawork breaks are taken, which both directly and indirectly affected break-taking practice and/or the need for breaks during this time.

7.2.1.1 National, political and local context

The rate of Covid-19 infections varied largely over the course of the first year of the pandemic, with various, chronologically labelled ‘waves’ or ‘surges’ (e.g. first wave, second wave) which described a period where there were drastic increases in the national average of infection rates and often resulted in national lockdowns, where members of the public were unable to leave their homes, except for essential purposes – including to work in essential services where the work could not be done at home. Additionally, some waves had a greater impact than others, for example, in the UK, *“the second wave was a lot worse than the first time around. ... this winter period [November/December 2020] actually was a hundred times worse than it was in April May when they did their interim.”* (C096-FY1) Case rates in participants’ local areas had a significant effect on the number of patients presenting in hospitals, healthcare professional workload, and procedural decision-making (described further in 7.2.2).

On a global, national and more local scale, the pandemic unfolded differently and disproportionately affected some places more than others. A participant working outside the UK spoke about Covid-19 cases in their country, explaining that *“it’s a little bit of a different timeline from the UK... Overall there has not been such a big Covid presence...and we’ve just come out of our lockdown so we have a lot more liberty.”* (C094-FY1) However, within the UK, case rates also varied largely across regions at any given time. Some areas saw sudden surges in cases while others remained low or stable. This eventually resulted in governments across the four devolved nations implementing ‘circuit breaker’ local lockdowns at different points over the course of the pandemic. As a result, case rates and the proportionate effect on participants’ work (and home) experiences differed at any given time, depending on the unique way that the pandemic presented and affected their local area.

Geographical context, the size and density of local populations, and the size of hospitals-also affected the availability of staff and resources. For example, *“We had quite a big spike over Christmas [2020] with about 1,000 cases, and we're a population of less than 100,000, so it was quite a significant number. ... [But] there is definitely not enough staff and they can't pull from a big resource pool here.”* (C094-FY1) The impact of ‘waves’ on healthcare services was therefore relative and could not simply be explained by case rates alone. The resulting effect on division of responsibility and workload affected the opportunities for intrawork breaks and self-care.

As the pandemic unfolded differently in different locations, each with its own political and social nuances, the local laws or guidance under which participants worked also differed. Early in the pandemic, a participant with pre-pandemic experience for comparison, explained that, *“with all the top down edicts that have come from Public Health England, the government, there have been some significant changes and restructuring”* (1003-Registrar). Indeed many structural and procedural changes in workplaces, especially hospitals, in response to the Covid-19 outbreak were dictated by external decisions (e.g. government, GMC).

The variation in experience of Covid-19 effects was evident in participants’ narratives, across countries, regions, cities, towns and between and within trusts and hospitals. There were also differences across specialties and departments, with layout changes and case rates affecting some more than others, and associated disparate effects on break taking.

7.2.1.2 Hospital layout changes

To respond to the novel threat of the Covid-19 outbreak, participants explained how their respective hospitals and departments *“had to drastically change its layout and its structure... There have been changes and modifications every day.”* (1003-Registrar). At the start of the first and second waves, participants explained *“there was no real plan in place... They were just shoving random patients in until they kind of had time to sit and think and work out where everyone should be going.”* (C136-FY1)

For the most part spaces were *“reorganized slightly to make sure that you're separating respiratory patients and treating anyone with respiratory symptoms as if they're positive.”* (1001-FY) In this participant’s department, for example, *“they've separated two sides of [AMU] out to be a suspected ward and from there they wait for the results of the tests... If it's negative they can move on. If it's positive they either stay there or go to the specialist infectious disease ward.”* (1001-FY) Patients often moved to, or between, designated areas which some described as ‘red’ and ‘green’ wards: *“When I say ‘green’ I mean no Covid. And if anyone does get Covid they get moved away”* (C059-FY1), whereas ‘red’ wards were *“Covid contact or Covid... where they had Covid patients”* (C059-FY1)

Participants explained that organisations had to *“make sure that hot spots in the hospital are given the resources, are given the staff, are given the beds.”* (2179-Core) At the start of the outbreak, in preparation for the forecasted Covid-19 patient numbers, hospitals had cancelled scheduled care such as elective surgeries. Consequently, a ‘green’ ward could be utilised for other purposes and in many hospitals *“the wards were all mixed up”* (C051-FY1) For example, in one hospital, *“they’ve changed two of the surgery wards to Covid wards”* and *“they split the [T&O] ward in half, so it was half still trauma and orthopaedics and then the other half was some Covid patients.”*(C136-FY1)

It was clear from participants’ descriptions that, early in the pandemic, work spaces were rearranged rapidly in response to the fluctuating threat from Covid-19. However, one year after the first national lockdown, in March 2021, a participant explained that in response to the vaccine rollout, increasing population immunity, and, at the time, decreasing case rates, *“there’s a lot of discussion at the moment about what they’re gonna do moving forward. ‘Cause I think they’re trying to sort of revert the hospitals back to their normal process but we still need to have somewhere to send the possible Covid patients...so that we don’t get mini cluster outbreaks. But there hasn’t been any decision making on how that’s going to be yet.”* (C138-FY1) Indeed a year later participants still described a level of uncertainty about the duration of structural (and procedural) changes or how spaces might look in future.

7.2.1.3 Changes to break facilities

Alongside the changes to ward layout and nationwide restrictions on socialising, there were physical and procedural changes in hospital break facilities. Early in the pandemic, a participant explained that *“to minimize us bringing or carrying the potential viruses to other parts... we are encouraged not to go to the mess.”* (2064-FY) Almost a year later, some participants explained that restrictions in break facilities still applied: *“Our mess is currently closed because of Covid... You can go in to pick something up, but you’re not actually allowed to be in there.”* (C138-FY1).

When break facilities remained open, participants described how hospitals made changes to the spaces or rules to prevent transmission: *“they took away most of the chairs... for social distancing... Costa doesn’t have any seats anymore, the mess only has about nine. There’s a canteen, but you can’t sit within 2 meters of anyone while you’re there.”* (C136-FY1) Additionally, *“we have signs in the queue and footprints on the floor saying ‘social distance’.”* (C096-FY1) In another hospital *“there are number caps for the [break] rooms and if you’re not eating you’re masked.”* (C138-FY1)

Elsewhere, to enable social distancing, *“they’ve blocked off certain areas of our mess.... They’ve put tape, you know, like yellow police tape.”* (C086-FY1) While the participant understood the reasoning, they described a significant impact on the atmosphere of the facility as *“it doesn’t create that*

relaxing culture that we kind of need on a lunch break.... It doesn't feel very restful." With social distancing rules and the closure of break facilities, many participants described being unable to informally connect with near peers and colleagues: *"With Covid it's been harder because we don't have a place where we're all allowed to be... It makes it difficult for everyone to be in the same space and to be able to talk."* (C086-FY1)

The amount of space in break facilities, or their layout, could affect whether it was possible to comply with the guidance. In one participant's mess *"it's all cramped together so it's just difficult to social distance"* (096-FY1) Presented with the problem of insufficient space, a participant explained that *"during the first wave, they put the mess in the PGMC [Postgraduate Medical Centre]... a lot bigger, a lot more space."* (C059-FY1) However, this was not well-timed as *"they did this up until about October, so when it wasn't even the pandemic... When it went into the second wave we were still stuck...in a smaller space."* (C059-FY1) To mitigate the risk of catching Covid, therefore, some would *"just take myself somewhere [else]. I once sat outside in a little garden that we have. Another time I just sat in the computer room doing my emails."* (C059-FY1)

Some participants saw social distancing rules as nonsensical as *"you can't social distance amongst your work bubble because you work on the same ward as them. As much as you'd hope that we could social distance on a ward...we don't have the space... [But] now you have stand 2 meters apart for lunch."* (C096-FY1) However, one participant described their personal experience of the consequences of not doing so: *"I got Covid and had had lunch with lots of people in the mess that day and none of us had been socially distancing so I ended up taking out like eight of the F1s."* (C121-FY1) Indeed due to incidents like this, participants explained that *"we keep getting people come into the mess saying 'if you're not meant to be here, go home. You can't just sit here and chat because you might give each other Covid.'"* (C136-FY1)

Contrary to the experience of losing facilities, in some cases participants described the introduction of new or improved break facilities during the pandemic, with some hospitals recognising the need for doctors to rest and recharge. One participant explained that their trust had *"done a wellbeing room. So we got massage chairs and ice cream and popcorn...and it's open so that you're allowed to go in there and actually just relax and take time out from the ward."* (096-FY1) The participant explained that this was an additional space, separate from the mess, for doctors. The same participant also described efforts made in the mess as, due to the (national) restrictions, *"we were paying for the mess but we haven't had any socials. They've been using the money that we pay in other ways, so we've all got Nespresso coffee machines and they got new sofas, lots of new things for the mess."* Similar to pre-pandemic participants, these facilities were appreciated insofar as they were in accessible locations: *"I used it [the wellbeing room] a lot more in surgery because it was*

closer... Now I'm a floor above and it is literally on the other side of the building... It just needs to be in a better place.” (C096-FY1)

7.2.1.4 Organisational climate and culture

Many changes during the pandemic were evident in the way spaces physically changed or the distribution of beds that were filled compared with typical working conditions. However, participants also described the more intangible ways in which their working contexts changed over the course of the pandemic, including the organisational climate (the general atmosphere of the work environment) and the organisational culture (the shared norms and collective beliefs about how things should be done in the workplace).

In the beginning of the outbreak, the organisational climate was largely impacted by drastic changes which *“left everyone exceptionally on tenterhooks waiting for the next big change to come along and completely bugged up all plans that have been made... [But] we're now starting to settle into the structural changes in the department a lot more, because everyone starts to normalise change or upheaval.”* (1003-Registrar) As the pandemic progressed, the climate seemingly changed in response to the fluctuating pressure on the healthcare system: *“There was definitely a really horrible atmosphere in the hospital when it was really bad. There was something like 11 Covid wards at one point... Everyone was just miserable... And now you notice everyone's a bit more hopeful and cheery, 'cause I think we're kind of coming out the other side with one Covid ward left... The overwhelming mood of the hospital has become better.”* (C121-FY1)

Pre-pandemic participants described a work culture that prioritised work above rest and self-care. The extraordinary pressure exerted on the healthcare system at the height of the pandemic was an opportunity for this culture to thrive. A participant who began their career during the pandemic commented that *“the culture I've moved into is one where it values slaving away and staying late, and it's seen as a badge of honour if you've signed up for extra night shifts to help out and you've exhausted yourself... [but] we would be so much better off if people were well rested”* (C094-FY1) Participants explained that it was particularly difficult to have boundaries around taking time for breaks during the pandemic, *“because people might look at you funny or they think you're work shy... It's like I'm a doctor, I should be just willing to give every single bit of me to work... If you take your full break sometimes it's kind of shunned, just because there's always something to do.”* (C059-FY1)

The culture around missing breaks, generally, seemed to persist through observed actions or perceptions of colleagues' opinions, instead of spoken words: *“If other people are skipping lunch or busy, then you do it too, 'cause you feel bad then taking a break when they're not.”* (C114-FY1) A participant with work experience outside of medicine explained that the culture also persists because

“those who've come straight into medicine and then straight into this as their first job never worked for anybody else. I think it's much easier for me to recognize...that this is not normal.” (C094-FY1) The interim foundation year (FiY) cohort could be particularly vulnerable to accepting and continuing a culture of non-stop work and minimal self-care as *“I've never worked in an NHS that wasn't affected by Covid so I've never really known any different.”* (C138-FY1)

During the first national lockdown, a campaign known as ‘Clap for Carers’ (later known as ‘Clap for Heroes’) garnered a lot of attention. At 8pm on a Thursday night, members of the public across the UK would stand outside their houses and clap for a minute to show their appreciation for those ‘working on the frontlines’ during the pandemic. However, participants described how these seemingly positive gestures might inadvertently reinforce systemic issues: *“Lots of the rhetoric around the pandemic like heroes and clapping and things like that has also really put people off wanting to raise concerns. I think it's all just feeding into this unsaid culture that says ‘this is what it's like, just get on with it.’”* (C094-FY1) Public messaging that places doctors and healthcare professionals on pedestals as ‘superhuman’ can therefore unintentionally fuel a culture of ignoring self-care or taking breaks in favour of helping others.

7.2.2 Pandemic impact on processes and the team

Many of the structural changes (e.g. changes to ward layout) and external decisions made during the pandemic had a significant associated impact on the internal processes and ways of working within hospitals. There was a need to change existing protocols and create new ones to care for patients, prevent the spread of infection, and maintain sufficient staffing. Many changes also affected participants’ roles and their opportunities for progression. Modifications to job roles and ways of working affected participants’ workload, work hours, competing priorities, and access to support, which directly and indirectly affected participants’ job roles, opportunities for breaks, worries and concerns, and the need for rest and recovery.

7.2.2.1 Protocol changes

Early in the pandemic, participants explained that Covid-19 was *“just a brand new virus and every question you ask there's just no semblance of an answer that we can really give.”* (2002-FY) This meant that constant changes to protocols and ways of working were inevitable, with one participant explaining *“every day it's new rules. Don't do this. Don't examine this. So we're all just constantly staying up to date and staying within the guidelines.”* (2067-FY)

To accommodate structural changes and reduce the spread of infection, some ways of working changed drastically. For example, *“lots of important members of the multidisciplinary team weren't*

coming in, just because of foot fall. So a lot of things were done over Microsoft Teams and Skype.”(C059-FY1) Indeed where possible (e.g. administrative work, outpatient appointments, GP settings) remote work was encouraged. This also affected learning for trainees. Some training was cancelled entirely, for others it moved online “which is slightly limiting the amount of teaching you can have, you know, with practical things.” (094-FY1) There were also restrictions on visitors in clinical spaces: “If they were Covid positive they weren’t allowed to see the patient... They could do zoom conversations but that was about it.” (C096-FY1)

7.2.2.2 Changed patient needs

With Covid-19 being a new virus, at the start of the outbreak many doctors were unsure of what to expect. Those who had contact with Covid-19 patients explained, *“We’ve had a few test positive and those ones are super sick.” (2032-FY) As a result, “there were a lot of Covid patients desaturating, and I did find it more difficult compared to normal work because they do get unwell very quickly.” (C114-FY1) Particularly in patients with comorbidities, participants explained that during surges, “every day there’d be like one or two new patients that had passed away in the middle of the night... Basically whatever we were doing, nothing would help.” (C096-FY1) Containing the virus therefore became essential to prevent spread to other patients and staff.*

While existing protocols and ways of working were modified, entirely new ones were created to care for Covid patients, which created new challenges and questions. For example, *“if someone is coronavirus positive, if they go into cardiac arrest... you do not start chest compressions until you’ve got properly gowned up... But there’s no guidance over if someone’s likely Covid, but not confirmed... That five minutes could mean the difference between life and death.” (2002-FY)*

Other new processes included the Covid-19 testing procedures, which resulted in new wards, roles, and different ways of working with most patients admitted to hospitals. This represented another learning curve for participants. For example, *“mine is the suspected Corona ward... We have people coming in, literally waiting for a test result, and then they go back onto the open ward... You have to sit down and read through their notes every single time. You don’t get used to the patient.” (2002-FY) It also had implications for all staff on how to deal with patients as “if a patient is expected or suspected to be a Covid patient, we have the protective personal protective equipment while seeing them” (2179-Core)*

7.2.2.3 Personal protective equipment challenges

Personal protective equipment (PPE) was a significant concern for interviewees, both at the beginning of the outbreak and nearly a year later. PPE represented protection from the virus for participants themselves and to prevent them from unknowingly spreading infection, therefore “it

could save lives.” (C059-FY1) At the start of the outbreak participants described instances where “we ran out of masks... It was only for a period of hours but nevertheless that was a bit disconcerting.” (2090-FY) PPE was described as “a major issue right now to be honest... Everyone is really antsy about it... We don't know if things are coming... PPE is insufficient at the moment... And the testing in relation to the PPE is also not okay.” (2032-FY) At the time, due to low supplies, some participants were ineligible for PPE because, “it's not for the ward staff. But on the other hand, if I'm wearing my own clothes then that puts my family at risk and it also puts my patients at risk” (2002-FY)

Later in the pandemic it was not only the availability of PPE but also the quality that concerned participants. For example, *“in some hospitals... in any red zone they'll give you full PPE, so a full gown [and] FFP masks, one of the proper masks.”* However, in the participant's own hospital on Covid wards *“you're just expected to go in regular PPE, which is just gloves [and] a thin apron which doesn't cover your arms.”* (C059-FY1). PPE supply, quality and protocols further added to participants' workload, worries and concerns with an associated effect on the opportunities or need for breaks.

7.2.2.4 Job roles and progression opportunities

The rapid structural and procedural changes had a significant impact on participants' roles. Many placements were impacted by the pandemic, with some being postponed, changed or cancelled. For example *“I was supposed to be rotating to a research-only block, but...I have been asked to stay on clinical work... My colleagues...were supposed to go on psychiatry or other less stressful jobs but...they now have to stay on medicine.”* (2064-FY) As a result there were juniors who *“got stuck in the job for eight months 'cause they didn't rotate.”* (C138-FY1) For others, there was considerable change and uncertainty surrounding their placements as *“we were all due to change on the 1st of April and then we were told maybe not. And then we've been told probably yes.”* (2067-FY) Uncertainty also arose for some because *“the [substance misuse] service I'm currently in will probably be shut by the end of the week... I don't know where my job is going to be after that.”* (4009-Registrar). Once decisions were made, however, changes could be very rapid, with some having *“half a working days' notice to basically change to a different employer.”* (2067-FY)

Several training and upskilling opportunities were cancelled: *“Our apprenticeship was cancelled, our electives were cancelled.”* (C138-FY1) Some had a significant effect on participants' career progression, for example *“I had a few months left before I CCT [certificate of completion of training] and become a consultant... [But] the exams have been cancelled. ...If I am forced to take it at the next sitting that means adding on potentially another six months to my training.”* (1003-Registrar) Participants explained that progressing from registrar to consultant or FY2 to registrar not only resulted in salary increases, and therefore there were (anticipated) financial losses for some, but these moments were also opportunities to *“potentially step out or move off or go and do other*

things... If I had all these plans in place, it would have completely thrown them out of the water.”

(1003-Registrar) Disruption to job roles and progression was a significant source of uncertainty, concern, and upheaval to participants’ work and personal lives but many acknowledged the necessity to staff areas of great need.

7.2.2.5 Staffing

Most changes and uncertainties in relation to placements and job roles were caused by the significant challenges to staffing in healthcare services for the first two years of the pandemic. In addition to typical absence due to illnesses (other than Covid-19), annual leave, or time in lieu, there were laws on self-isolation – a period of time individuals had to remain at home if they were in contact, or infected, with Covid-19. These laws varied over time, including which symptoms or level of contact qualified. In the UK, the period of isolation was originally 14 days. It reduced to 10 days in December 2020, 7 days in December 2021, 5 days in January 2022, and the legal requirement to self-isolate was removed in February 2022. Due to their inherently high level of contact with patients carrying the infection, throughout medical settings *“a lot of people were self-isolating so there was minimal staffing”* (C051-FY1)

Staffing and rota decisions were described similarly to other structural and procedural decision-making at the start of Covid-19 surges: *“We’re being quite reactive to the here and now, rather than forward planning. But equally it’s hard to forward plan because we just don’t have a clue what the workforce numbers are going to be.”* (2090-FY) As a result, participants explained that *“there was just no structure”* (C094-FY1) and juniors *“would be each day just sent off to work in different places and it was so disruptive”* (C094-FY1). Many participants remarked that *“beyond next week I don’t have a rota, so I don’t know what hours I’m working”* (2002-FY)

Similar to pre-pandemic narratives, which described a direct effect of staffing on workload (and vice versa) as well as subsequent opportunities for breaks, participants explained: *“when you’re the only one that’s working to look after 13 patients you don’t leave at 5.”* (C059-FY1) and *“I would have days where there was 30 patients and just me and the consultant on the ward.”* (086-FY1) Alternatively, the opposite could be true where poor rota planning meant *“there’s twice as many of us [but] we’re half as busy ‘cause they’ve taken away loads of the [surgery] wards.”* (136-FY1)

To meet increased or anticipated demand, some participants experienced changes to their work hours. For example, *“in the past on the wards it was predominantly 8:30 to 5, but...because they want to spread out doctors and have the ward staff for longer, they are going to spread us out to maybe shifts of 8 hours each.”* (2064-FY) For others, *“we had all of our out-of-hours and nights and weekends doubled on like three days’ notice.”* (C136-FY1) To further help relieve some of the staffing

challenges, *“a lot of our colleagues who were not necessarily in medicine have been pulled back to medicine.”* (2064-FY) Additionally, new job roles were created, such as the FiY role, meaning that *“everywhere got given an extra one or two people. Even though we were training and new and finding things difficult, we were still an extra pair of hands and within a few weeks...we could take some of the workload off everyone else.”* (C086-FY1) However, this solution was temporary and in August 2020 *“the staffing massively reduced... The interim people became actual doctors so we were not making up their shortfall anymore.”* (C086-FY1)

7.2.2.6 Workload

Given the significance of workload to break taking under typical conditions, and the widely acknowledged impact of the pandemic in increasing pressure on healthcare services, it is unsurprising that workload was the most commonly cited factor affecting break taking in the survey data (Chapter 6). Similar to pre-pandemic narratives, almost all interview participants explained that whether breaks are taken *“depends on the workload on the day”* (C138-FY1). It also had a correlational effect on break duration because *“if there's not a great deal to do there's more time to take pause.”* (C138-FY1)

Pre-pandemic participants described workload as varying on a typical day. During the pandemic this was exacerbated by the various surges of Covid-19 infection, meaning certain times were more pressured than others: *“I was quite lucky to work on medicine over the summer rather than over the winter [when] it was much more difficult.”* (C094-FY1) During the second wave, which was commonly described as having a greater impact than the first, even those areas that were green, Covid-free zones could ‘turn red’ and suddenly, on a green stroke ward for example, *“we were struggling to find a bed that didn't have Covid... It got to a point where we were having a lot of people with end of life... There was one week I went down to bereavement every day for a week... [and] that week I did seven people's death certificates.”* (C096-FY1) As a result of the increased workload at these times, *“there would be quite a few days that we'd have lunch at 4 o'clock or skip it... 'cause you just don't have time... And if people are unwell you can't really leave.”* (C114-FY1)

In addition to the typical procedures involved in caring for critically ill patients, if they were suspected or confirmed Covid-positive *“you're masked up and gowning up... There is more time doing things like that before you can even treat the patient or get near the patient.”* (1001-FY) and *“after every patient it's...degowning and washing... In a normal situation, you probably could see about double the patients in the time.”* (2002-FY) As a result, the new protocols and ways of working introduced to prevent the spread of infection also added to the existing high workload and reduced the already limited space in a shift for breaks.

7.2.2.7 Effect on different specialties and departments

In phase 1 participants described inherent differences between specialties, under typical working conditions, that worked to encourage or discourage break taking. The Covid-19 outbreak appeared to make these differences more salient as red wards appear to have been disproportionately affected by workload and staffing issues. Pre-pandemic participants described specialties and wards as 'hot' or 'cold' (see 5.2.2.2) which impacted patient acuity, the need to be accessible, and opportunities for 'escape' breaks (see 5.2.3.1). In the context of Covid-19, green wards were generally 'colder' wards and red wards were comparatively 'hot'.

Emergency medicine, acute internal medicine, and respiratory wards were directly affected by Covid-19 infection rates and were therefore comparatively 'hot'. Participants explained that during the second wave, *"the hours on respiratory were just absolutely shocking... On average, I would never leave on time."* (C138-FY1) Additionally, *"there were a couple of days during AAU when I didn't find time [to take breaks]... I just went home without [eating] anything."* (C114-FY1) However, overall, emergency medicine and acute internal medicine were still said to encourage and foster good break-taking habits through the pandemic, similar to pre-pandemic participants' experiences: *"We're better on AMU at having lunch at what I would call a sensible lunchtime... I get a reasonable lunch break. I generally stop for coffee or a drink after the ward round as well."* (C138-FY1)

Specialties like surgery were previously described as hot specialties, where break taking was comparatively more difficult than medicine. However, during the pandemic participants explained that *"because they'd cancelled all the elective surgeries, the surgical wards were mostly empty"* (C136-FY1) and therefore *"it was much more difficult for those who were on medicine. We had a reasonably easy ride on surgery."* (C094-FY1) Consequently break-taking habits changed and *"in surgery...people are much more likely to take breaks."* (C114-FY1) Similarly, in specialties like haematology and oncology, *"we are dealing with very few patients at this time. So usually we have 80 beds... Now I believe less than half of them is occupied, only 30 or 35."* (2179-Core)

Specialties like psychiatry were also seemingly less affected by the pandemic. They experienced staff shortages as *"people did go off with Covid, but it didn't impact me very much... 'cause it wasn't that busy anyway."* (C059-FY1) Similar to pre-pandemic participants, it was described as having *"just a bit more sit-down space... I have an office and I can sit in there with a cup of tea to do my work and take a bit more breaks... Because they [patients] are physically not unwell most of the time, stuff can wait."* Therefore, rather unusually, *"my consultant says we should have an hour instead of half an hour for lunch."* (C086-FY1)

7.2.2.8 Senior presence

Similar to pre-pandemic participants, senior support was highly valued and desired – potentially more so during the pandemic, as demonstrated by the preceding survey results (see Figure 17 and Figure 18). A participant explained that *“there are fewer emergencies definitely, I’ve noticed, when there are more seniors available to ask questions at an earlier stage when someone deteriorates... [And] to just ask a question quickly rather than having to spend ages looking it up.”* (C051-FY1) Consequently, participants explained that a lack of senior support could lead to less teachings, being less efficient, and juniors often finishing their shifts late.

The physical presence and availability of seniors was also said to be important because *“you know they are available on the phone...but it's not really the same as having somebody who turns up and checks in on you and offers to help.”* (C094-FY1) During summer and the FiY placement, when Covid-19 cases were lower, participants described having considerably more visible, hands-on senior support than during surges when juniors were *“constantly fracturing off and sent to other teams... You get lost in a sea of other people... There's no senior responsible for you to check-in each day.”* (C094-FY1) Additionally, due to staff shortages many hospitals had *“quite a high proportion of locums...at a senior level.”* (C094-FY1) The lack of consistency or rapport-building led to instances where *“I got a bit told off for going to the mess too early, even though there was nothing going on on the wards... Because you're working with people you don't know...they don't necessarily trust that I'm doing my job.”* (C086-FY1) Moreover, an FY1 participant described an example of how:

“It was very unsupported until you actively asked for help... There was one very memorable man who had bladder cancer and it ruptured. He lost absolutely tons of blood and he ended up dying... I was dealing with that on the phone going, ‘yes, I know this is supposed to be a registrar-to-registrar referral system. However, there isn't one. It's just me. I've done my best, but he settled, got unstable, he's lost 3 litres of blood and I don't really know where to go from here, so could you maybe come and help out?’” (C136-FY1).

Overall, participants explained that *“a lot of the juniors feel very abandoned by the seniors who were then not seen on the wards, left the juniors to sort it all out.”* (C094-FY1) However, most juniors acknowledged that this was likely unintentional and due to procedural and system-level changes out of their seniors’ control. They acknowledged the additional burden that seniors appeared to carry: *“They seem burnt out... They don't want to teach or they don't want to be present [probably because] they usually have so much asked of them that then when they have a quiet moment, they'd rather go and do some self-preservation.”* (C094-FY1) Indeed a more senior member of staff described their frustration during the first surge, and that *“it takes a lot to make me flap, but I've definitely noticed I*

was getting very stressed. And it was having a secondary knock-on effect to some of my staff, I'm sure of it." (1003-Registrar)

7.2.2.9 Support from colleagues

In the absence of senior support, participants explained that fellow *"juniors plug some of the gaps."* (C094-FY1) Support could also come from other clinical staff and allied health professionals who *"share lots of the frustrations with how Covid is being managed and with the seniors as well. It feels like they are on our side...and they're very supportive"* (C094-FY1) Indeed to cope with pandemic pressures, participants explained that it was important for teams and near-peers *"to pull together and just make sure we all look out for each other because...it's a lot of stress for everyone."* (2067-FY)

Support from colleagues could be through timely handovers. For example, while on nights *"my colleagues who are coming on to day shift are very keen and very understanding and go, 'Don't worry about it. Just tell me what needs to be done. I'll sort it.'"* (1003-Registrar), allowing the outgoing colleague to leave on time. Support could also be pastoral, often taking the form of communication about shared experiences *"so that we all know that it's not just me...with a family and a child who is worried about how this might impact upon them."* (1003-Registrar) Some participants required slightly more from colleagues, as *"my mental health wasn't very good... It made me doubt whether I was doing well enough. So I had to ask for affirmation from my colleagues...that you're doing okay and that you're doing the right thing."* (C086-FY1)

Work breaks represented an opportunity for these conversations and rapport building as *"we'd go to lunch together...and we'd just chat stroke rant."* (C138-FY1) Indeed the dynamic of some teams and colleagues meant they *"are quite good at noticing when people are feeling a bit overwhelmed...[and] have absolutely no shame in going 'This sucks, I'm having a really bad day. Does anyone wanna go get coffee 'cause I just need a break?'... [or] even pre-empting that."* (C136-FY1) Through these experiences, many participants found that *"I got really close to my colleagues... We were all each other were seeing so we talk and we become each other's social bubbles."* (C086-FY1) and because *"a lot of us have kind of lent on each other, it makes you make friends a bit more quickly when you're all having a bit of a rubbish time together."* (C121-FY1) Consequently, in coping with the disruption caused by the pandemic, many found that *"the camaraderie of that team made a massive difference. I think if the group hadn't been who they were it would have been a lot harder."* (C138-FY1)

7.2.3 Pandemic impact on the individual

Participants described how the significant impact of the pandemic on system and procedural factors subsequently affected them as individuals and their need for rest and recovery. They explained how

working during the pandemic interacted with their 'doer' personalities, the threat it posed to their wellbeing, their many worries and uncertainties at different stages of the pandemic, how pandemic conditions affected their access to effective coping methods, the importance of an individual's level of experience to dealing with the challenges posed by the pandemic, and individuals' level of autonomy and power within the challenging circumstances.

7.2.3.1 The 'doer' personality

The pandemic was described as both a blessing and a curse to the very prevalent task-oriented 'doer' personality. Although the public heralded NHS staff as heroes for continuing to work and sacrifice themselves on the frontlines during the pandemic, many participants explained that, despite the immense challenges facing staff, *"work has been a source of wellbeing as well, bizarrely"* (C086-FY1). Because *"medics tend to have quite a Type-A personality, they tend to like to work hard."* (C094-FY1) Participants generally considered themselves fortunate that *"I am still getting to go to work at a job that I really do enjoy and there are loads of people around... I'm not furloughed and stuck in my flat 24/7 not able to see anyone."* (C136-FY1) Work was a blessing simply because they remained busy and *"my biggest thing is I hate doing nothing."* (C096-FY1) Indeed 'doers' found that *"I actually really like dealing with emergencies, I find it really exciting. The times I've struggled in the past have been in downtime, when I have time to ruminate on things and worry about things."* (2043-FY) For similar reasons, the participants who took up the FiY placement were generally grateful for the experience as *"it gave me a routine and social contact."* (C138-FY1)

However, the pandemic also presented a challenge to the 'doer' personality: As doctors had comparatively more exposure to the Covid-19 virus, they were also likely to require multiple periods of self-isolation. Most participants did not appreciate isolation periods as recovery time or breaks from work, but rather described them as *"just hideous"* (C051-FY1) Some explained *"I'm very bad at being in my own company"* (C121-FY1) For many, isolation represented a lack of purpose as *"I'm literally sitting in my flat cleaning my house twice over and watching TV... So many hours in the day to pass the time before it was bedtime again."* (C096-FY1) It not only removed the ability to remain busy and social, but with constant changes at work *"you don't like being out of the loop...the system, and going to work keeps you in the system."* (1003-Registrar) Many participants had to isolate simply because they tested positive for Covid-19, despite being asymptomatic and feeling well enough to work. They described being *"very frustrated...because I want to help. I know the NHS is on its knees... I could be useful... I have a job to do and I can't do it. I'm just itching to get going."* (2043-FY) For many, the periods of self-isolation conflicted with their sense of duty to work on the frontlines but also to keep others safe from infection.

7.2.3.2 Pandemic as a threat to wellbeing

Participants described the many ways that the pandemic could, or indeed did, affect their wellbeing. Doctors' physical health was affected, especially through contraction of Covid-19 infection(s), which were likely due to their high level of exposure: *"I was actually unwell... All I wanted to do was sleep, I didn't really wanna eat, I didn't really wanna move. So I just sat in my bed and slept."* (C096-FY1) Wellbeing was also threatened by the increased workload as *"working as a doctor is difficult and long hours, but this must be something else because this is F1 with a pandemic on top. So it's quite exhausting. I'm quite tired a lot of the time."* (C059-FY1) This sense of exhaustion was also said to be more concentrated in the FY1s who undertook the optional FiY placement as *"F1's really hard without [it]. We basically willingly extended that program by about three months... Was it sensible?... We're all really tired... Feeling a little bit fragmented... We should have taken the break."* (C138-FY1)

Pre-pandemic participants often described themselves as workaholics who prioritise patient needs or the needs of the job above their own. However, during the pandemic, with increased workloads, work hours, and a general lack of opportunities to adequately rest and recover, participants described a subsequent impact on their work ability as *"I know that I'm not going to be my best self for the patients, for myself. It's horrible. Like imagine going to work hungover. It would basically be like that."* (C059-FY1) Some participants experienced having *"that moral injury where you feel like you just can't do the best you want to do for people"* (C094-FY1), either due to the depletion of their own physical or mental reserves, and/or those of the broader system (e.g. PPE supplies or policy changes). For some, *"the side effects of it was me being unsure of how good I was at my job because I was just having really low self-esteem."* (C086-FY1)

Many participants experienced difficulties with mental health as a result of pandemic pressures. For some this was due to the constant changes to their work environment which *"caused a lot of stress and it's caused a lot of headaches... It is exceptionally mentally exhausting... I'm probably more frustrated and irritable than I normally am."* (1003-Registrar). Moreover, the surges of infections and subsequent increase in patient death rates had a significant impact on many participants' mental health:

"I almost felt a bit broken... It was just like an endless cycle of this person's going downhill, this person's gonna die, this person has died... I was like 'actually I'm done with this job.'... I can't deal with breaking any more bad news. I can't deal with telling families that your relatives and your loved ones are going to die, when you're having to do it three or four times a day, long conversations." (C096-FY1).

Indeed many participants described a sense of burnout in themselves, their colleagues and seniors. Several participants expressed a desire to take a career break when they were next able as they felt they would otherwise *“sell my soul to the NHS for the price of exhaustion and being demoralized.”* (C094-FY1) Beyond their workplace, it was also partly due to feeling mentally oversaturated elsewhere: *“All you did was come into work, get exposed to Covid, see Covid, come home, be tired, and then go back on and see more Covid... [At home] my parents kept asking me, ‘Did you see this in the news?’... [And] all the news talked about was Covid... I'm living Covid.”* (C096-FY1) With the order to stay at home during lockdown(s), the inability to escape the pandemic at home and work seemingly exacerbated feelings of exhaustion and burnout.

Many participants' health and wellbeing endured during the most stressful times – the surges and the immediate burden on the healthcare system. Once case rates began to lower and work environments became less pressured, some found that the decrease in workload and mental load meant that *“it was a bit easier to safeguard and look after my wellbeing... [But] as soon as I had a space to be away from it, it then led to me feeling really stressed and mentally unwell.”* (C086-FY1) As a result, the pandemic's threat to doctors' wellbeing might not have been reactive, or realised in the moment as events were unfolding. For many the effects were delayed until a point when they had a chance to reflect.

7.2.3.3 Worries and uncertainties

Given the overall impact of the pandemic on doctors' mental health, it is unsurprising that they described *“lots of uncertainty, lots of worry amongst the medical workforce”* (1003-Registrar). At the beginning of the pandemic, participants worried about the unknown in their near future and whether the virus would overwhelm the system *“because you look at how the death tolls keep rising in other countries. It just doesn't seem like anyone has a handle on it.”* (2032-FY) Participants explained that *“we know there will be a huge influx of patients. We know, as it stands, we won't be able to cope with it.”* (2067-FY) There was also much uncertainty regarding, for example, whether re-infection was possible, the long term effects of the virus, the accuracy of tests, and participants were particularly concerned about the idea of having *“no intensive care beds [and] having to make horrendous decisions about who gets the beds and who doesn't.”* (4009-Registrar) Indeed a common theme among participant's worries throughout the pandemic was sufficiency - whether there would be enough space, staff, support, PPE, and tests to meet demand. Some also worried about sufficiency of knowledge and experience: *“I don't feel very well prepared...but I don't think I feel any less prepared than any other doctor. I think none of us really know what we're dealing with here.”* (2043-FY)

With respect to the risk of contracting Covid-19, participants explained that *“working in a hospital...you're walking into the lion's den every day, and you don't know if you're gonna get it.”*

(C059-FY1) Some were *“worried for my own health because I have failed most fit-testing...to see whether the mask will prevent airborne particles to enter my airways.”* (2064-FY) Most participants described themselves as low risk due to their age and health status, but among the patients they had seen in hospital, *“there are so many people who have been completely healthy and fit before, and when they become infected, they develop a heavy health burden or they even died.”* (2179-Core). This caused concern that the same could happen to them, however, many also acknowledged that *“obviously we don’t see the ones who are [faring better] at home with symptoms, so it’s a very skewed view of what it’s like.”* (2032-FY) For some participants the main concern was not necessarily for themselves but rather *“you look around the ward and there’s certain people you can point to and go: If you get corona, you will die. It’s those sorts of people that you don’t want to be an asymptomatic carrier to.”* (2002-FY) Participants also worried about the risk to their families. Some participants therefore worried about social breaks explaining *“my team will want to have lunch together... but you feel a bit uncomfortable... Social distancing [is] a bit hard when you’re all eating together”* (C059-FY1)

Beyond worries about themselves or their families, some participants also took on the mental load of patients’ or patients’ families’ experiences, often due to policy changes out of their control. For example, a participant working on a dementia ward was concerned that patients *“can’t do activities together... They’re there 24 hours a day sitting in the same bed, doing the same thing on repeat... Part of the reason people deteriorate might be because they’re just stuck in the bed looking at the wall all day.”* (C059-FY1) Additionally, with visiting restrictions, many participants had experiences where a patient’s *“family requested a visit and we said no because of Covid and then they died suddenly”* (136-FY1) Families *“would hear that their loved one had passed away over the phone and they still wouldn’t be allowed to see them.”* (C096-FY1) Although participants understood why the rules were in place, they described the repercussions as difficult or ‘depressing’.

Despite the plethora of worries and anxieties, when asked whether a participant felt they could cope with the uncertainties they described, they responded *“yes, because that’s what doctors do.”* (4009-Registrar)

7.2.3.4 The role of skills and experience

Participants explained how the pandemic’s impact on individuals, particularly in relation to anxiety about uncertainty, could be affected by their level of experience. This could refer to the length of time a doctor had been working. For example, a participant noticed that, in an online forum, worries and concerns were expressed *“more often from the more junior staff by the looks of it. That’s not to say that the senior staff are not worried, just that we may choose not to articulate it as much. Or we’re dealing with it better. Or we’ve just got different stresses.”* (1003-Registrar) Another participant

remarked that it was time on the job, not textbooks or learning, that taught them in medicine *“there’s always an element of make it up as you go along and hope for the best.”* (2002-FY) and that this was the best approach to the pandemic.

Participants also described how the type of work that they had previously undertaken could be helpful experience in the pandemic. Some specialties were said to deal with uncertainty more than others. For example, a participant explained that *“A&E is definitely at the front line, the definition of unplanned care. That’s what we deal with on a day to day basis... It has prepared us.”* (1003-Registrar) The participant also explained that the pandemic *“is very much like a major incident... An event of medical proportion which is likely to, or will, or is, overstressing resources by the umpteenth degree.”* The participant had relevant previous experience as they had *“worked in Salisbury when the Novichok cases came in... I was dealing with the acute fallout over the night shift after the patients started presenting.”* Nevertheless, the participant felt that the upheaval caused by the pandemic was *“much longer, much bigger, much more disruptive.”* Others found that experience in acute medicine also provided helpful skills as *“with that sort of workload...it’s about triaging what’s more important and what can and can’t be done today”* (C138-FY1)

The voluntary FiY role was also described as invaluable experience to some as otherwise *“we would have started F1 without any form of preparation for practice at all, because...our apprenticeship was cancelled, our electives were cancelled, it was all pulled out.”* (138-FY1) The FiY role involved *“learning the systems and learning the teams”* (C138-FY1) and therefore by the start of FY1 *“I was just a bit more familiar with who people were and what was expected, having seen the F1s above me do them.”* (C094-FY1) Because the FiY cohort began FY1 during the second, more debilitating Covid-19 surge, *“I would absolutely have drowned in August if it wasn’t for that [FiY] job.”* (C086-FY1).

Participants described other helpful skills gained over time, which included *“actually saying ‘no’... At the start of medicine...I was like ‘Yeah, I’ll come and do it if I have time.’ And then I just realized I actually don’t have time...[and] it’s not that urgent... So I was just like ‘actually that could wait.’”* (C096-FY1) Additionally *“I feel like my confidence is definitely growing”* (C086-FY1). For some participants, increased confidence meant being able to ask for help or ask questions. Combined, these skills also helped facilitate better break-taking and self-care habits as *“I’ve definitely got better at prioritizing what’s a pre-lunch and post-lunch job... And knowing, actually recognizing in yourself, that you need to stop and have some food before we carry on, because otherwise you just start doing things badly.”* (C121-FY1)

7.2.3.5 Coping methods

Coping strategies are an important source of detachment and recovery and affect the physical and mental resources available to doctors, as well as the resulting need for intrawork breaks to overcome any deficits in recovery. Hobbies, personal interests and social interactions outside the workplace allow doctors to *“leave [work] at work and...to think about other things. Because I can't change anything worrying at home.”* (2067-FY1) Given participants' many worries and the threat of the pandemic to their wellbeing, their coping methods were likely more important than ever to maintaining their stamina and wellbeing, particularly during surges. However, surges resulted in national lockdowns and, due to legal restrictions (e.g. no socialising or leaving homes for non-urgent business), many participants remarked that *“all my normal coping strategies are out the window.”* (C094-FY1) particularly in their home lives where *“I had nothing to distract myself with.”* (C096-FY1)

An important loss for many was that *“no one is going to see family...because I guess we are all quite high risk and it is quite difficult to justify.”* (C136-FY1) Some participants, particularly FY1s, had moved across the country for their new placements whereas others had family abroad. This meant *“I didn't really know anyone here when I moved and I didn't come with anyone or anything”* (121-FY1). Due to restrictions, these participants were unable to return home and social opportunities to make new friends were scarce. They regularly used digital means to contact family and friends *“but it's not the same.”* (C138-FY1)

For those participants who, outside of work, would ordinarily *“do something every evening and the weekends are always jam packed...it's been a bit of a shock to the system... [I am] forced to have this very non-busy lifestyle, and it doesn't suit me very much.”* (C121-FY1) Many would *“usually play a lot of football...go to the gym and things like that”* (C136-FY1) However, with the restrictions, participants who were once very active found their time was more occupied by passive activities, explaining *“we just sit around the flat...[and] put all of the money that I'm saving from not socializing into nicer takeaways or nicer alcohol.”* (C136-FY1) Participants acknowledged *“I don't think it's great for me, but at least it's turning off not thinking about work.”* (C086-FY1)

Participants explained that *“it feels like work is the only thing I do anymore, which means it's kind of a bit less enjoyable.”* (C121-FY1) As Covid-19 was so prolific in their work lives and there were very few opportunities to escape it through usual methods, some participants described a need to have boundaries around particular topics of discussion, explaining *“that's why I don't listen to the news...and, especially with my parents, I don't like talking about vaccines or Covid.”* (C096-FY1) For others, debriefing was important as *“I find it very cathartic to come home and share my frustrations.”* (C094-FY1) This could include keeping a diary or blogging about their experiences. These participants

still maintained boundaries as they would *“talk about it with people as much as I can, without it becoming too much of my life outside of work.”* (C086-FY1).

In spite of the restrictions and challenges to usual coping strategies, some *“managed to make the best out of it...even if it's just going for a walk in the dark.”* (C121-FY1) and to take an approach of *“celebrating that I have time to do things...I wouldn't normally have time to.”* (C094-FY1) However, even those pursuing a positive outlook would explain *“I'm not gonna whitewash it, it's very difficult.”* (C094-FY1) With the loss of coping methods in their home life, breaks at work seemingly had greater importance, even if they were harder to come by, as *“when I have been able to get breaks...I felt so much better [and] able to cope.”* (C094-FY1) While not a substitute for the level of recovery usually provided in doctors' home lives, escape breaks often represented the only opportunity for a change of scenery and social interaction outside the wards, and therefore facilitating them could partially fill this need and maintain stamina and wellbeing.

7.2.3.6 Autonomy, power and passivity

Under typical conditions many participants described a level of agency or control, even as juniors or FY1s, which allowed them to challenge their environment or the wider culture. However, during the pandemic this seemingly changed as *“things have been very prescribed from a top down approach.”* (C094-FY1) With the unprecedented level of *“uncertainty along with multiple things changing, not just within the department, but [also] outside of the department that we have absolutely no influence upon, that makes you feel exceptionally vulnerable, frustrated and very, very irritated... You do feel powerless to be able to do stuff [and] doctors often are doers.”* (1003-Registrar) This sense of powerlessness and lack of control was described by junior and senior trainees alike.

Many perceived themselves as passive recipients of the disruption caused by the pandemic. Unlike pre-pandemic participants, they generally sought ways to cope with, rather than change, their circumstances: *“I'm contributing to these cultural things that I don't like: I don't take my breaks and I don't report them... But I think there's only so many battles you can pick...[while] also trying to preserve some of your energy so you have enough to give the next few days.”* (C094-FY1) The overwhelming pressure on the system meant that time (and energy) was limited and therefore *“when things are busy you just get on with it. You don't really question it.”* (C138-FY1) Importance was instead placed on remaining fluid to the ever-changing environment.

Participants explained that the only way to deal healthily with the challenging circumstances and their passive role was to *“focus on things I can do and not what I can't do”* (C094-FY1) Remaining present-focused (not ruminating on past or future events) was important as it allowed participants to persevere through, for example, staff and PPE shortages by *“just ploughing on, just doing the best*

with what we've got." (2032-FY). Participants also often felt that it was important to remember *"there are quite a lot of positives that have come out of this very strange pandemic."* (C121-FY1) For example, recognising that, despite certain placements being very challenging, *"it was a good learning experience."* (C136-FY1) Those whose career progression was affected by restrictions acknowledged that while it *"feels exceedingly unfair...we've all got to tighten our belts and do a bit of give and take. It may very well be that this is the best of a bad situation."* (1003-Registrar) Some participants found it important to gain a broader perspective and keep *"remembering that I am not just defined by what I do in my work... There's so much more to me than just the Hospital."* (C094-FY1)

7.2.4 Opportunities for intervention under pandemic conditions

Although hospitals during the pandemic were, generally, a challenging work environment for participants, they also described or identified ways to change the work environment that could potentially mitigate the risk to doctors' wellbeing and/or improve opportunities for break taking. It is clear from the surveys data in Chapter 6 and the qualitative data presented here, that, alike pre-pandemic participants, improving *"the basic things like staffing"* (C051-FY1) or lessening workload would create space in the day and help participants to better cope with the effects of the pandemic as well as the work pressures pre-dating Covid-19. Participants explained that *"these are, I think, chronic things that they're not necessarily going to fix."* (C138-FY1) whereas the pandemic represented an urgent threat. In the absence of permanent system-level fixes, participants described (both desired and realised) solutions to ease the immediate strain on the system and individuals.

7.2.4.1 Temporary staffing interventions

In addition to hosting FiY doctors from April to August 2020, participants explained how some trusts implemented solutions to staffing shortages: *"They offered more locum shifts so there was more doctors around... One of the weekends there were about 12 of us on, when there's normally only about 5. The numbers were doubled."* (C138-FY1) Some also *"put an extra consultant on in the evening. So the consultant normally leaves about 6, 7 o'clock, but they had a consultant stay til' 11... It made a massive difference."* (C086-FY1) Although participants were grateful for the extra resource, they explained that *"it's not sustainable"* (C138-FY1) and *"when Covid settles it will probably stop."* (C086-FY1)

7.2.4.2 Communication

The many rapid structural and procedural changes often represented a large disruption to staff. However, many participants commented that, from trusts in general, *"their communication has just not been good."* (C094-FY1) For example, as trusts were being fairly reactive to staffing numbers,

“whoever was there was there and whoever had to isolate or be moved elsewhere was not...[but] if I’d have just been told what was going on rather than just turning up and then finding out, I think that would have really helped.” (C094-FY1) A participant remarked that without adequate communication *“we seem to be put at risk and we didn't sign up for that... If I know in advance that this is what my duty, or my job, entails and this is what I'll be exposed to....I will be working this number of hours, I will have this amount of money in compensation...at least I would be making an informed decision.”* (2179-Core) Poor communication therefore added to the overwhelming sense of uncertainty described by participants.

Although communication was broadly lacking, participants explained that when they were self-isolating it was particularly problematic as *“I just didn't get [any] information because I wasn't in hospital”* (2067-FY). For those who could access their email account remotely to check for important updates *“they send all these links in e-mails...which you can't access unless you're on a hospital computer”* (2032-FY) Some trusts improved their communication strategies, albeit later in the pandemic, and *“we ended up having daily meetings on Microsoft Teams with Covid updates and an opportunity for people to say anything that was on their mind... It changed for the better definitely and we all got kept in the loop a bit more... It was nice to finally be a bit more aware of what was happening.”* (C121-FY1) Providing regular updates, in a remotely accessible format, is a seemingly feasible means of trusts easing a lot of unease and uncertainty among staff.

7.2.4.3 Consistency

With a high level of locums and many other temporary changes, in addition to the overall high level of uncertainty caused by the pandemic, a sense of structure and consistency was highly desired by participants. One way to achieve this was *“preserving a team structure... Our ability to cope would be so much stronger if we had like a core unit of two or three people...stay working as a unit. Not be constantly fracturing off and sent to other teams... To give people no notice and then to just expect people to constantly be flexible and not belong to a team really, I think, wears down people's value.”* (C094-FY1) Having greater consistency and belonging to one ward or specialty was also described as a way to improve efficiency as FY participants, for example, could become familiar with *“the types of patients, you understand the conditions, you understand the drugs. I just find all the simple jobs take me longer [when changing wards]... For a respiratory patient I could look through and immediately see the drugs that need to stop when they go home, but in cardiology...I'll have to look up everything.”* (C051-FY1) Additionally, with greater consistency *“you're handing over to people that you already know and that you know how to speak to.”* (C051-FY1)

7.2.4.4 Check-ins

Alongside a consistent team structure, participants expressed a desire, similar to pre-pandemic participants, for regular wellbeing check-ins from people at work *“who are used to working together, who knew each other...knew what was going on at home... People who make an effort to find out how you're doing.”* (C094-FY1) Breaks were said to be a good opportunity for this as staff could informally interact and get to know each other. However, participants also mentioned that *“even if it was just an email to say ‘hi, how's it going?’ I think that would be beneficial, because I know people that wouldn't speak up unless they were asked.”* (C086-FY1)

While regular check-ins could be done by staff in a similar role or level of seniority, participants described advantages to having *“someone senior that I can talk to, but also understands how things work if wellbeing isn't going well... Someone with answers... Someone I could approach that wasn't a random wellbeing guide... Someone that I knew personally who was responsible for me.”* (C084-FY1) Similar to pre-pandemic narratives, participants explained that senior check-ins could also refer to and encourage break taking because *“when you're asked or told to go take a break, I think that makes a difference”* (C114-FY1) Similarly, they could also function as reminders and encouragers of exception reporting because *“I've definitely exception reported on the advice of my consultants a lot more... They're like ‘what time did you finish, did you go home on time?’ And I was like ‘no’. [Senior:] ‘Exception report it.’”* (C096-FY1)

7.2.4.5 Debriefing

In place of a check-in, one participant explained that they preferred *“not so much having time for me to talk but more hearing how other people...coped with the same thing that I've seen on the ward... Somebody saying, ‘yesterday, after this patient died, I went home and I found that difficult, and I did this and this to help.’”* (C051-FY1) In this way staff could debrief together. Debriefing was valued by many as *“when we did it I went away feeling so much better. I actually left stuff at work.”* (C094-FY1) Participants highlighted the importance of talking about their experiences and debriefing, particularly in relation to issues around death and breaking bad news to families. Some explained *“we do it informally over lunch normally...a form of debriefing. But it's not a formal discussion of stuff we're finding difficult. I guess it's just like talking to friends.”* (C051-FY1) However, many found that, with decreased opportunities for social breaks, *“I haven't really spoken to the other doctors about it because we don't get the chance.”* (C059-FY1) When communal break facilities were closed or socialising was prohibited, this important and valued coping method was lost.

7.2.4.6 Virtual support

Beyond using digital methods to keep in contact with family members, participants described ways in which trusts or work groups used them to provide support. Sometimes this was for information sharing purposes, for example, *“the department Whatsapp group is dedicated to Covid-19. So somebody updates information, advice, suggestions about how should we be dealing with patients who are suspected or who will be positively confirmed to be Covid patients.”* (2179-Core) The same technology was also used to provide informal pastoral support for each other. This could include smaller groups of colleagues of certain grades or teams, for example, *“we've got lots of different work [Whatsapp] groups and when I was isolating...we had our own little [FY1] isolation group chat... And we were all on it all the time 'cause we had nothing better to do.”* (C121-FY1). Other virtual groups provided support for broader groups of staff, for example, *“I'm part of a group called Tea and Empathy, which is a Facebook group.”* (1003-Registrar). This group provided informal peer support for NHS staff of all roles, grades, and specialties.

7.2.4.7 Training

Some participants received additional pandemic-specific training on a range of topics, such as *“intensive care courses to learn about ventilation and helping people with respiratory problems... because not everyone has had all that training.”* (2067-FY1) or education about the virus itself. At the beginning of the outbreak a participant found this to be particularly valuable as *“a) it helped me realize that it [Covid-19] is a dangerous thing, that we should be alarmed about it... And b) it gives me idea about what can I do to protect myself.”* (2179-Core) In this way training could address some of the uncertainty and sense of unpreparedness that many individuals felt, particularly at the start of the pandemic or the start of a rotation.

With the potential for increased patient deaths and the anticipated impact on staff wellbeing, some participants also *“had various talks about having difficult conversations with relatives and how to debrief as a team and things.”* (C051-FY1) However, referring to talks and teachings of this nature, the participant explained that *“I haven't felt any of that to be particularly helpful. I feel like often it's delivered by people who aren't really doing it themselves.”* The participant also explained that, despite the training, they were not given opportunities to debrief as a team in practice.

7.2.4.8 Valued gestures and activities

To express gratitude for NHS staff working on the frontlines of the pandemic, there were several gestures of goodwill from the commercial sector too: *“businesses are giving us discounts, are giving us free coffee, are giving us 50 percent on meals. Uber is giving us free rides and free food deliveries.”* (2179-Core) In addition to free coffees from shops in many hospitals, there were *“people delivering*

free food to the hospital...and snacks...like fruit or granola bars.” (C114-FY1) In addition to helping staff feel appreciated, offers of food or drink *“also promotes the rest of the team to actually go and have a look together, and then we take a bit of a break.”* (C114-FY1) Therefore, similar to pre-pandemic participants, free food was an effective break facilitator.

Less valued gestures included *“a physio or a dance teacher who would come to each of the wards for 15, 20 minutes during the height of the pandemic to dance with the staff and do some stress relief... We didn't have time.”* (C094-FY1) Other ill-received gestures were *“wellbeing talks arranged outside of your work hours”* which were *“really poorly attended 'cause people are exhausted. They want to go home, have some dinner, and go to bed... It would be better to build that into your day when everybody's there.”* (C094-FY1) Indeed, similar to pre-pandemic experiences, participants found that for many gestures, including wellbeing activities, ‘wobble’ or ‘calm’ rooms in hospitals intended to provide escape breaks, or *“free therapy sessions... as much as I want to, I don't take it up just because...I don't really see where I could fit it in.”* (C059-FY1)

7.2.4.9 Consultation and co-production

Many trusts implemented well-meaning interventions during the pandemic but *“we didn't have time to go dancing around the ward. What we wanted much more was to feel listened to, go home on time, [and] have good PPE.”* (C094-FY1) Consulting staff and co-production of interventions was important but not commonly done. Being experts on their own experiences, participants were aware that, instead of what was on offer and poorly attended, *“there are a couple of other things that would be relatively easy to do and make a big difference to people’s wellbeing.”* (C094-FY1)

Regarding consultation on bigger structural and procedural matters, with individuals having a more passive role during the pandemic, it is perhaps unsurprising that some felt *“a bit of bitterness...that they [trusts] could do some things quite different. I think we just want to be heard and feel involved in decision making.”* (C094-FY1) While some changes to the work environment were imposed from external, national-level decision-making (e.g. social distancing or isolation rules), participants described some disappointment in the internal, trust-level decision making as *“they didn't really understand or seek the opinions of what we were doing and how we as juniors were feeling.”* (C094-FY1). This was important as *“it's easy on paper to look like you're doing all that you should be doing in terms of minimum staffing and having somebody in the office you could go raise serious concerns, but the reality day-to-day is quite different. And I don't think managers in particular have any idea really what we do day-to-day.”* (C094-FY1)

7.3 Discussion

7.3.1 Pandemic impact on structures, processes and the individual

The purpose of these interviews was to capture and compare doctors' experiences of the workplace and break taking during the Covid-19 pandemic with those of pre-pandemic doctors (Chapter 5). Using the main themes inductively derived in Chapter 5 as a coding framework, the deductive thematic analysis showed that the pandemic had a significant impact on most of the factors described by pre-pandemic participants, providing important contextual data for the preceding quantitative survey results from foundation year 1 (FY1) doctors.

While structural and procedural factors were important to pre-pandemic participants' break-taking and workplace experiences, they gained greater significance in the wake of considerable structural and procedural changes in hospitals throughout the pandemic. Participants seemed to more easily identify and describe structural and procedural phenomena that affected their workplace experience than under typical pre-pandemic conditions, likely because the changes were significant and visible enough to gain attention. The subsequent impact was apparent for phase 1 participants (any doctors at FY2 level or above), who had a pre-pandemic frame of reference. Participants' narratives therefore confirmed suspicions that the pandemic would cause considerable disruption to the workplace and the landscape, or broader contexts, in which breaks are taken.

In pre-pandemic narratives about break taking, the individual had a similar weighting with system and process level factors - having an effect on and being affected by each other. However, with Covid having such a global, systemic influence, the data placed individual factors in a more secondary role. Contrasting Figure 20 (summarising the themes in this chapter) with Figure 12 (depicting themes from pre-pandemic interviews in Chapter 5), individual factors were still prominent in the pandemic data but not as agents of change in the break-taking landscape or the workplace as a whole. The data suggests that individuals were instead passive recipients that needed to cope with, and mould themselves to, the resulting disruption.

The survey results showed that break-taking varied over time, with more breaks being taken in the summer when Covid-19 cases were low, and less taken over the winter as case rates surged. Unsurprisingly, surges feature in all the interview themes (structural, procedural, and individual) and most subthemes, as they had a considerable effect on participants' workplace experiences. As infections increased, so too did workload and staff absences through sickness or isolation – the two most consistently prevalent barriers to break taking in both the pre-pandemic and pandemic quantitative surveys as well as the pre-pandemic interviews. Surges also resulted in increased national, local, and trust-level restrictions; increased chances of being redeployed to unfamiliar

environments; and the need for (though often lacking) more support from seniors and colleagues, resources, and PPE. Modifications to policies and procedures were also necessarily reactive to wider contexts and individuals bared the responsibility of carrying out their duties in fluctuating environments and functions, amid a significant loss of autonomy and control over their surroundings. Certain specialties and wards were more affected by surges (or pandemic conditions in general) compared with others, with a seemingly associated and proportionate effect on break taking practices. Similar experiences across the various phases and surges of the pandemic has also been demonstrated in a longitudinal qualitative study with healthcare professionals in the UK (Borek et al., 2022).

The organisational culture described by pre-pandemic participants was one that promoted work completion above self-care and this seemingly intensified during the pandemic. Public messaging deemed healthcare professionals 'heroes' who prioritise the needs of others above their own, making participants less inclined to assert their boundaries on breaks at work or more broadly on their sense of wellbeing and self-care. Cox (2020) provides a detailed overview of the implications of the 'heroic' messaging, explaining that heroes make an informed choice to go above and beyond what is required to help others, in spite of known risks or personal sacrifice. However, participants in these interviews explicitly describe not making an informed or voluntary choice to sacrifice themselves beyond the performance of their duties at work. Cox also explains that there is an important sense of reciprocity expected by healthcare professionals in performing their work duties: 1) From healthcare organisations who are expected to provide adequate protection (e.g. PPE), clear communication, sufficient resources to carry out duties, and adequate support for employee wellbeing; and 2) from the public who are expected to pay taxes, vote for governments that support healthcare systems, and follow public health guidance to prevent the spread of infection (e.g. social distancing, wearing masks). It is clear from the data (e.g. lack of PPE, communication, and resources) that the reciprocal agreement was not always honoured by policy makers or organisations and the 'hero' messaging puts healthcare professionals at risk by removing the need for reciprocity and systemic change in place of honouring individual sacrifice. The weight of structural and procedural barriers depicted in Figure 20 simply becomes heavier and the individual lacks the power or energy reserves to fight for change.

With a great deal of disruption, alongside increased workload, staffing issues, and a host of other challenges in the workplace, the pandemic represented a significant threat to individuals' wellbeing. Much of participants' life, both at home and work, was over-saturated with the topic of the pandemic and, with legal restrictions in place, there were very few opportunities to escape. Participants described a multitude of worries about the threat of the pandemic to their families, their patients, themselves and the wider community, which echo the pandemic literature elsewhere (e.g.

Shanafelt, Ripp, & Trockel, 2020). In their more passive roles, participants described a loss of autonomy and control, which was previously highlighted as an important requirement for doctors' wellbeing (West & Coia, 2019). Additionally, the lack of consistency through being redeployed to unfamiliar environments, which interview participants described as particularly challenging, was also shown to predict higher levels of burnout in a multinational cross-sectional study with healthcare workers in the UK, Poland and Singapore (Denning et al., 2021). Research in nurses and clerical staff has also shown that job control is an important predictor of break-taking ability (Blasche, Wendsche, Tschulik, Schoberberger, & Weitensfelder, 2021). With lower levels of job control, break taking is less likely. However, amid the threat of the pandemic to doctors' wellbeing and a lack of access to usual coping methods outside the workplace, intrawork breaks might gain greater importance in mitigating the global deficits in doctors' rest and recovery.

Participants often found their physical and mental stamina withstood surges in Covid-19 infections but was more affected once infection rates slowed and hospitals began to function more normally, providing them with space to think and reflect. This is not unlike Ekstedt and Fagerberg's (2005) understanding of the process that precedes burnout: individuals begin with conflicting inner demands between self-nourishment and responsibilities at work. They start ignoring the inner conflict and shift sole focus to their work, to the detriment of recovery activities. Subtle or early warning signs of ill-being, both physical and psychological, are easily ignored through this focus shift but gradually grow stronger, alongside fatigue. Individuals finally reach the 'bottom line' where the symptoms worsen enough to get their attention, leading to them feeling drained and an overwhelming need for escape. Indeed several studies and reports found an increase in the prevalence of burnout or psychiatric morbidity among doctors during the pandemic (e.g. GMC, 2021b; Jefferson et al., 2022) With Fagerberg's understanding of burnout and its relation to recovery needs, intrawork break taking is likely to take on more importance for doctors' wellbeing during the pandemic to cope with increased work demands, but it is also likely to be less prioritised in the face of other urgent work.

Tenacity, perseverance and remaining present-focused were important to cope with the loss of agency, overwhelming uncertainty posed by the pandemic, and to remain fluid and flexible to the ever-changing work environments. Other qualitative research with health and social care professionals echoed this need to 'accept uncertainty' (Aughterson, McKinlay, Fancourt, & Burton, 2021). Furthermore, a study on UK doctors and final-year medical students found that psychological flexibility negatively predicted symptoms of anxiety, depression, PTSD and burnout during the pandemic (Johns, Waddington, & Samuel, 2022). Some interview participants with this seemingly effective coping strategy still described a sense of burnout at work and a desire to take career breaks at the next possible opportunity. The concern would be for those doctors whose personalities or

existing mental health is not immediately conducive to accepting a great level of uncertainty. The data described thus far shows that the NHS is already understaffed and under-resourced. It is therefore essential to invest in and research the means of encouraging rest and recovery, improving staff wellbeing, and ultimately retaining staff during periods of high demand on healthcare services (e.g. pandemics, winter pressures, major incidents).

7.3.2 Areas for improvement and intervention

Participants described interventions, or identified potential areas for improvement, which could address some of the structural or procedural factors that had a significant impact on their workplace and break-taking experiences during the pandemic. Predictably, systemic issues identified in the preceding pre-pandemic and pandemic surveys, like high workload and insufficient staffing, remained a high priority to allow adequate space in the day for breaks. Participants described temporary staffing interventions that were implemented to ease the overwhelming pressures (e.g. locum posts, staff remaining in medical placements, the early introduction of the FiY cohort in the first wave). Although participants were aware that these solutions were not permanent fixes, they were highly effective and highly valued and point to the potential of more permanent solutions to insufficient staffing in managing workload pressures – under pandemic and typical working conditions.

Juniors expressed a need for greater senior presence and check-ins regarding breaks and wellbeing, which they described as severely lacking, particularly during times of great need (i.e. during surges). However, they acknowledged that seniors were dealing with increased demands and seemingly high levels of burnout themselves. Though not an adequate substitution, they found that colleagues and near peers filled the gaps in support where possible and insofar as restrictions on socialising allowed.

To help staff prepare and deal with some of the consequences of the pandemic, trusts often provided training on practical issues arising from Covid-19 (which helped ease some uncertainty) and many hosted wellbeing teachings, break activities (e.g. dancing classes), and talks. However, the value of interventions was negated if they were hosted outside of participants' work hours or by someone without lived experience of participants' jobs. Indeed confirming suspicions from the pandemic quantitative surveys, co-producing wellbeing interventions with doctors, and consulting with staff representatives on decisions that will significantly affect their day-to-day work, was of great importance to participants. Many doctors found the interventions on offer (e.g. wellbeing rooms, therapy sessions, break activities) were inaccessible to them due to location, start time, or workload, and had different ideas of what could make a meaningful difference to their wellbeing.

Other seemingly feasible requests for intervention under pandemic conditions included better communication and more regular updates from trusts in remotely accessible formats, preserving a team structure, remaining in a given role or placement, having regular check-ins with near peers or seniors, and providing formal or informal opportunities to debrief.

7.3.3 Strengths and limitations

The pandemic interview data add to the knowledge base on breaks and the importance of the contexts and working conditions in which they are taken. The data provide perspectives from two different time periods over the course of the pandemic: 1) The first round of data collection, which included trainee doctors in various roles and levels of seniority, gathered views at the beginning of the outbreak in March 2020. These phase 1 participants experienced the introduction of restrictions and described the (then) novel events as they were unfolding and were able to compare their work and break-taking experiences under typical, pre-pandemic conditions with their experiences following the Covid-19 outbreak. 2) The second round of interview data collection occurred one year later, with a cohort of FY1 doctors who had undertaken the inaugural (and as yet only) FiY role. These participants gave a retrospective account of the first year of the pandemic, which was also their first year working as doctors in the NHS. They provided a unique viewpoint of the pandemic, as it was the only environment they had known in their work experience to date. This meant that the pandemic waves or surges were more prominent and memorable events in their work experience, and they could focus on the potentially subtle changes brought on by a surge (e.g. winter 2020) as compared with their baseline pandemic work conditions when cases decreased (e.g. summer 2020).

Whereas some authors have demonstrated positive gains in participants' perspectives and experiences with only one month between qualitative data collection (e.g. Ardebili et al., 2021), this study incorporated a greater time difference of one year. Despite the time difference, the pandemic and associated challenges were still ongoing in the second phase of data collection and, if not occurring in the present, the retrospective experiences were recent enough for detailed recall and/or for the consequences to still be felt by participants.

As the phase 2 interviews with FiY (latterly FY1) participants were undertaken after the second wave of Covid-19 infections, this study provides a retrospective understanding of their experiences across both the first and second wave of the pandemic. Similar studies undertaken with FiYs often focused on the first wave and/or the immediate aftermath. For example, the large longitudinal research study commissioned by the GMC on the wellbeing of FiY doctors (Burford et al., 2021) concluded in November 2020, at the beginning of the second wave. However, the time period immediately following this was highlighted by FiY-FY1 participants in this study as the most challenging time in

their work experience to date. Consequently, some existing evidence tends to provide a predominantly positive outlook of the FiY-FY1 cohort's experiences (e.g. Bandyopadhyay et al., 2021) as most data was collected in the summer rather than the winter. This study therefore provides a unique perspective of FiY-FY1 experiences at a point in time that no research (at the time of writing) had yet captured and reported.

The use of qualitative data at both the beginning and end of longitudinal quantitative data collection is described by Plano Clark et al. (2015) as a strong longitudinal mixed method design, providing a combination of prospective (expectations) and retrospective (recollections) design. However, it should be noted that the early pandemic (phase 1) group of participants were distinct from the group interviewed one year later. This could be viewed as both a strength and limitation. The phase 1 participants include comparatively more senior doctors (such as registrars, SAS doctors and core trainees), providing a necessary and important perspective of various doctor grades' pandemic experiences, which was not present in the quantitative pandemic data (Chapter 6) as it surveyed FiY-FY1 doctors only. The data therefore represent a greater range of voices and perspectives at the different time points. However, the use of two distinct groups negates the ability to directly compare experiences over time on an individual level, which is achieved by a purely longitudinal design with the same sample of participants.

Despite the inclusion of the early pandemic group, junior voices remain over-represented in this chapter. Consultants and senior doctors were often merely described as absent from their perspective. Although some research found that junior trainees had more adverse mental health consequences during the pandemic (e.g. Doulias et al., 2023; Pascoe et al., 2021), this research has shown that senior trainees also experienced significant challenges before the pandemic and at its onset, and they had an important role in junior behaviours and experiences throughout.

While it was not feasible for this project, due to pandemic-related restrictions and barriers to recruitment at the time, future qualitative research could benefit from the inclusion of consultants' perspectives of their pandemic experiences and the support they could feasibly lend to juniors and/or would wish to receive themselves. Additionally, the recruitment to these follow-up interviews was contingent on responses to an online survey which, as previously discussed (see 6.3.1), often elicits a greater response from female participants. Although research shows that female doctors were also comparatively more at risk for adverse mental health during the pandemic (e.g. Dunning et al., 2022; Claponea, Pop, Iorga, & Iurcov, 2022), with 67% of phase 1 participants and 89% of phase 2 participants in this chapter being female, there is potentially a need to gather more qualitative interview data from male doctors.

7.4 Conclusions

The data describes a variety of perspectives and pandemic experiences, not only in relation to seniority by including junior doctors of various training grades, but also temporally, due to two different phases of data collection – one at the start of the pandemic and another a year later. Comparing narratives before and during the pandemic using similar coding structures demonstrated the significant changes to structural and procedural factors which placed the individual in a more passive role than in pre-pandemic accounts. Given the threat of the pandemic to doctors' wellbeing and/or intentions to leave the profession, the interview data provide an important and thorough understanding of doctors' experiences of the pandemic, the many ways that the workplace and break-taking landscape changed following the Covid-19 outbreak, and meaningful ways to intervene to improve break-taking practices and wellbeing under pandemic conditions. The data can therefore be used to aid future-proofing strategies and decision making in periods of high pressure on healthcare services.

Chapter 8 Overall discussion and concluding remarks

This final chapter integrates the findings from the studies described earlier in this thesis. Combining and summarising the findings of the systematic review and results from two phases of investigation using mixed methods, it proposes a conceptual model of break taking, provides recommendations for future research, and discusses the implications for policy and practice.

8.1 Summary and synthesis of findings

Chapter 1 described the high levels of burnout and problems with retention among UK doctors, under pre-pandemic conditions. The Covid-19 pandemic represented an additional, substantial threat to doctors' wellbeing. Some national policy and trust-level interventions sought to improve the break-taking environment at work in response to predominantly anecdotal evidence that a) break taking is rare among doctors, and b) an assumption that more breaks should improve wellbeing. Theoretical understandings of rest and recovery support the latter; however, initial searches suggested that supporting empirical evidence in doctors was lacking. The evidence summarised in the chapter suggested a need for systematic evidence synthesis and empirical exploratory research on the break-taking landscape.

Chapter 2 described the methods chosen for investigation in this thesis. A mixed method design was used to explore intrawork break taking in UK doctors preceding and during the Covid-19 pandemic. It included three studies in two chronological phases (pre-pandemic and post-pandemic outbreak):

1. A systematic review of empirical research on the effectiveness of break taking for doctors' wellbeing and/or work performance (Chapter 3) undertaken across both phases
2. Phase 1 Pre-pandemic sequential mixed method study:
 - a. Surveys administered to doctors and patients to quantifiably explore their perceptions on doctors taking breaks at work (Chapter 4)
 - b. Follow-up semi-structured qualitative interviews with a sample of survey-respondent doctors (Chapter 5)
3. Phase 2 Post-pandemic outbreak sequential mixed method study:
 - a. Surveys administered to a cohort of newly qualified (FY1-FY2) doctors at two different time points to quantifiably and longitudinally explore their perceptions of break taking during the pandemic (Chapter 6)

- b. Follow-up semi-structured qualitative interviews with a sample of post-pandemic outbreak survey respondents and a subset of phase 1 participants whose interviews coincided with the start of the UK Covid-19 outbreak (Chapter 7)

The systematic review of break-taking literature before and during the pandemic (Chapter 3; O'Neill et al., 2022) found that good-quality evidence in the doctor population was lacking on a global scale and specifically among UK doctors. There was much heterogeneity in design, focus of research, and outcomes, hindering cross-comparison and definitive conclusions about the effectiveness of breaks for wellbeing or work performance. The review also highlighted that information about break taking is often a secondary, incidental research question within a broader study. The findings of the review highlighted the need for good-quality focused research, particularly on the effect of standard 20 to 30 minute breaks – which are prescribed by current policy and guidance – in addition to further underpinning research exploring a) alternative break durations and practices, and b) break taking as a construct. The review also highlighted that experimental research was lacking in UK contexts, as well as precursory exploratory research to inform how best to develop the evidence base. Chapters 4-7 sought to address the latter gap in the evidence.

A pre-pandemic survey (Chapter 4) administered to doctors of all grades suggested that they perceived breaks as important to wellbeing but the majority of doctors missed their breaks on a daily or weekly basis. When the survey was repeated with FY1 doctors on two occasions during the Covid-19 pandemic (Chapter 6) and compared against FY data from the pre-pandemic sample, similar findings were seen at all measurement points. Break frequency improved briefly in the pandemic summer of 2020 but reduced to pre-pandemic levels in the winter, suggesting an important effect of winter pressures and/or surges of Covid-19 infections. Indeed, workload remained the most commonly cited barrier to taking breaks at all time points and for all subsets of the data, and, similarly, staffing levels consistently remained among the top three barriers to breaks, indicating the importance of these factors to break-taking ability. The availability of break facilities was the least cited barrier to break taking at all times. The top five and bottom five ranked break facilitators were the same pre- and post-outbreak, and although their rankings changed slightly over time, participants' responses indicated a clear split in priorities for interventions. The interventions participants consistently rated the most likely to make a difference to doctors' break taking addressed workload (having adequate cover, task delegation, handing over bleeps) and gave participants permission to take breaks (senior encouragement, making breaks mandatory). The interventions rated least likely to make a difference, at all measurement points, and by a considerable margin, were facility improvement, team building, break activities, educational campaigns and reminders about breaks. Nevertheless, the bottom ranked interventions are often

offered by trusts to improve break taking and/or as part of broader wellbeing strategies, while the top-ranked interventions are not implemented, likely due to financial cost or complexity.

Interviews with doctors sought to explore comprehensively the reasons for doctors' reports of infrequent break taking in the preceding surveys. An inductive thematic analysis of the pre-pandemic interview data (Chapter 5) produced a framework of factors that affected break taking at structural, procedural and individual levels. These factors interacted such that they affected, and were affected by, each other. A deductive analysis of interviews with doctors following the Covid-19 outbreak in the UK (Chapter 7) focused on the impact of the pandemic on the framework of factors derived from the pre-pandemic interviews. During the pandemic, structural and procedural level factors interacted and affected each other, similar to the pre-pandemic findings; however, due to the unprecedented (but necessary) level of disruption to systems and processes during the pandemic, the individual had a more passive role that focused more on accepting and coping with the considerable changes in their work (and home) environment than affecting change. The pre-pandemic and post-outbreak themes and subthemes are summarised in Table 15.

The interview data also provided greater understanding of doctors' perceptions of 'break taking' as a construct. In their narratives, doctors described break taking with greater nuance than a dichotomous ability or inability to take breaks. This resulted in the proposed concept of *break practice(s)* to include break duration, frequency, timing, location, degree of socialising, activities (e.g. work or no work), value (appreciation or importance) and restfulness (relative contribution to wellbeing and recovery). Grouping common patterns in participants' described break practices yielded three *types* of break: 1) 'working' breaks, 2) food and drink breaks, and 3) escape breaks. 'Working' or food and drink breaks were the most common type of breaks taken by doctors. Escape breaks were often referred to as 'proper' breaks and were likened to lunch breaks taken in industrial settings, where employees temporarily leave their work space, either together with colleagues or individually. These were consistently described as the most valued and restful type of break but they were least likely to be taken due to the many structural, procedural, and individual barriers to breaks described by participants.

Table 15 Factors affecting break taking in phase 1 and phase 2 interviews

Factors affecting pre-pandemic break taking	Pandemic impact on factors affecting breaks
Structures and settings <ul style="list-style-type: none"> - Geographical location - Acute vs community - Inpatient vs outpatient - Departments and specialties - Facilities - Culture and break importance 	Impact on structures and contexts <ul style="list-style-type: none"> - National, political and local contexts - Hospital layout changes - Changes to break facilities - Organisational climate and culture
Processes <ul style="list-style-type: none"> - Job role characteristics - Workload - Patient acuity - Staffing - Team dynamics - Interruptions - Seniors - Contractual guidelines and policy 	Impact on processes <ul style="list-style-type: none"> - Protocol changes - Changed patient needs - Personal protective equipment challenges - Job roles and progression opportunities - Staffing - Workload - Effect on specialties and departments - Senior presence - Support from colleagues
The individual <ul style="list-style-type: none"> - Definitions of breaks - Individual needs and preferences - Perception of breaks - Doctors as 'doers' - Breaks as an individual's responsibility - Skills and experience - Autonomy and power 	Impact on the individual <ul style="list-style-type: none"> - The 'doer' personality - Pandemic as threat to wellbeing - Worries and uncertainties - The role of skills and experience - Coping methods - Autonomy, power and passivity

Pre-pandemic and pandemic interview participants also described the interventions, or properties thereof, that would effectively improve the opportunities for escape breaks and/or their wellbeing in the workplace more broadly. While many interventions were offered by trusts, with well-meaning intentions, doctors often found they were not designed with doctors in mind and therefore they were unable to either engage with, or access, them. A strong finding across the mixed method studies in both the pre-pandemic and post-outbreak phases was that consultation and co-production is important to a) identifying meaningful interventions that can affect change, and b) achieving better uptake among doctors.

8.2 Towards a conceptual model

In a review of literature on ‘knowledge workers’ (described in section 3.8.1), Lyubykh et al. (2022) present an integrative conceptual framework of work breaks and how they affect wellbeing and performance (see Figure 21). Although healthcare workers would be included in their definition, there are inherent and considerable differences between the work environments of doctors and the broad ‘knowledge worker’ population. For example, there is likely to be greater variability in doctors’ work hours through shift work than those of an accountant who is likely to maintain consistent, day-time work hours. Additionally, the Covid-19 pandemic was a direct and unparalleled threat to healthcare professionals. Their workplace became the frontlines of the fight against the outbreak and their closer proximity to the virus put them at increased risk of stress, burnout, moral injury, depression, acute and post-traumatic stress, and other mental health difficulties (Søvold et al., 2021; Raudenská et al., 2020). It would therefore be prudent to account for the effect of pandemics or periods of high demand on healthcare services in a conceptual model about doctors’ intrawork break taking. Nevertheless, there are some overlaps between the Lyubykh et al. (2022) review and this body of work. It is therefore proposed that their model be adapted for doctors, in light of the findings presented in this thesis.

The adapted conceptual model is depicted in Figure 22. It incorporates findings across the studies of this mixed method research which sought to explore and understand the breadth of factors that affect doctors’ break practices, experiences, and perceptions. The model proposes that the factors that precede and affect break practices influence, and are influenced by, one another. However, because the individual’s influence on structures and processes is contingent on the presence of contextual factors (‘events’ like Covid-19 or major incidents), it holds a tentative and varying level of influence in the process, indicated by the dotted arrow. Adapted for the model, *break practice* comprises break frequency, duration, timing, activities (work vs no work), the degree of socialising, and the type of break taken. Together, the components of break-taking practice have an effect on various individual and group outcomes and experiences (rest and recovery, enjoyment, wellbeing, performance and job satisfaction), which subsequently affects the individual and group value ascribed to taking breaks. It is proposed that individual and group break-taking experiences feed back into structural, procedural, and individual factors and subsequently inform future practice and beliefs. Therefore, a feedback loop is inserted between the resulting effects of taking breaks, the perceived value of them, and the factors preceding break taking.

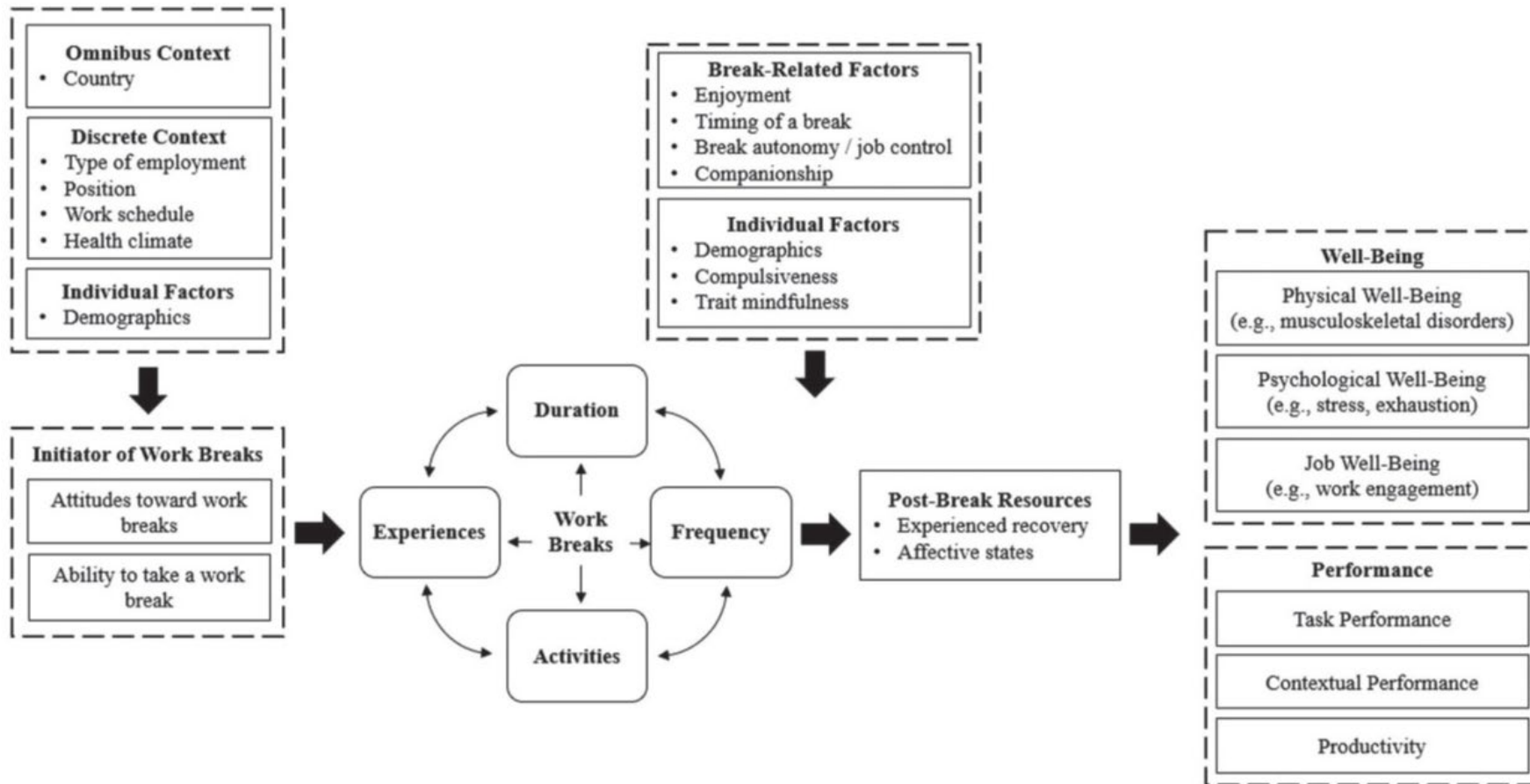


Figure 21 An integrative conceptual framework of work breaks proposed by Lyubkyh et al. (2022). Copyright © 2022 by American Psychological Association. Reproduced with permission. Lyubkyh, Z., Gulseren, D., Premji, Z., Wingate, T. G., Deng, C., Bélanger, L. J., & Turner, N. (2022). Role of work breaks in well-being and performance: A systematic review and future research agenda. *Journal of Occupational Health Psychology*, 27(5), 470-487.

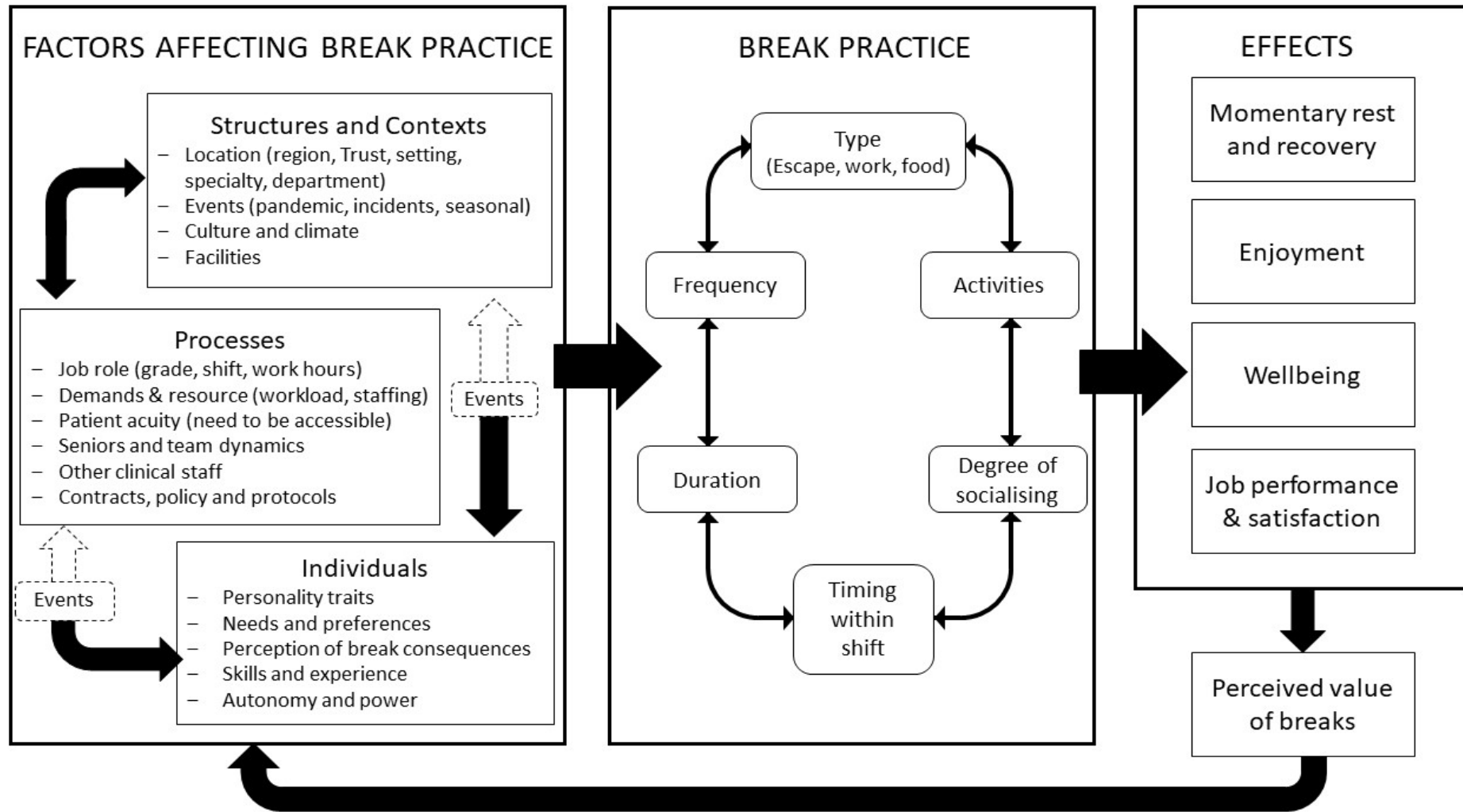


Figure 22 The proposed conceptual model for understanding intrawork break taking in doctors

8.3 Strengths and limitations

This thesis fills an evidence gap identified through the systematic review (O'Neill et al., 2022) by gathering and describing exploratory data on UK doctors' break-taking practices and perceptions. Through the integration of quantitative and qualitative data, advances were made towards understanding the host of factors that affect break-taking practice and perceptions, which resulted in a proposed conceptual model.

As a whole, the work provides a broadly longitudinal perspective by investigating break taking prior to and during the Covid-19 pandemic, and provides a more directly longitudinal approach during the first year of the pandemic through multiple data collection points over time. This allowed for an important quantitative finding that break-taking practice varied alongside workload and seasonal (or pandemic) pressures. The qualitative data collection prior to the Covid-19 outbreak and at different points during the pandemic (at the start of the outbreak and one year later), provide a unique perspective of how priorities and the break-taking landscape compare over time, in the wake of different contextual challenges and environments, which has important implications for future research as well as policy and decision making.

The data, however, have several limitations. While the first pre-pandemic quantitative study was able to achieve relatively equal representation, the follow-up interviews as well as data collected during the pandemic are over-representative of female voices. Additionally, although some registrars, SAS, and doctors in core training were interviewed early in the Covid-19 outbreak, senior and consultant voices are largely lacking during the pandemic period. This is related to pandemic-related restrictions on research at the time. The scope of this project was directly affected by limited access to healthcare professional participants or the ability to undertake experimental research with them in the wake of national and institutional restrictions (e.g. ethics committees, Health Research Authorities). It is likely that different support will be needed for doctors at different stages of training and their careers (e.g. see Pascoe et al., 2021). Therefore, while consultant and senior doctors' perspectives are important and should be sought in future research, the strength of this project's approach is that it resulted in a thorough understanding of junior doctors' workplace experiences (particularly FY1 doctors) and their perceptions of break taking both before and during the pandemic.

A further limitation, due to the pandemic-related restrictions on recruitment methods, is that subsets of phase 1 data (from FY doctors) were used in phase 2 as a) the pre-pandemic baseline for the quantitative surveys and b) the early Covid qualitative interviews. This means that longitudinal perspectives were not necessarily gained from the same group of participants at each time point. For the quantitative methods, this introduces a level of complexity when making statistical comparisons.

Additionally, the use of qualitative data at both the beginning and end of longitudinal quantitative data collection provides a valuable combination of prospective and retrospective narratives. However, the use of different participants might undermine this strength in methodological design.

8.4 Implications for future research

The findings of this thesis provide an exploratory starting point for future research on break taking in doctors. The systematic review demonstrated a need for greater quantity and quality of break-taking research on: 1) a broad, international scale as well as within the UK for relevance to local populations; 2) perceptions and priorities of doctors as break takers; and 3) optimum break-taking strategies and practices. This project makes advances towards addressing the first two areas of research need through its exploration of break-taking perceptions, experiences, and priorities of UK doctors. The findings of this exploratory research suggest that larger studies on break taking, involving doctors from across the four devolved nations of the UK, is warranted. The findings also indicate the importance of both quantitative and qualitative methods in research on break-taking practice. Further observational and interventional research that focuses primarily on break-taking is needed in UK settings and recommendations arising from this project are described below.

8.4.1 Observational research

Future epidemiological research could address this project's limitations by including the perspectives of more male participants, senior trainees, and consultants. As many consultant participants from the pre-pandemic survey commented that breaks were simply not part of their job, it will be important for future research to explore their views and experiences, the barriers experienced at senior level, and the relationship to broader organisational culture surrounding rest and recovery. Additionally, future research could also address the limitations of this research – and the majority of the existing evidence base – by using more objective, real-time measures of break-taking practice (e.g. using methods that record momentary break duration as opposed to retrospectively assessing break behaviour using Likert-type scales).

In addition to the recommendations above, future observational research could seek to understand the relationship between wellbeing, workload, and break-taking practice. The findings in Chapter 6 suggested that, when workload increased in winter 2020, due to the second Covid-19 wave of infections, break taking became more infrequent for FiY doctors than in summer 2020, when case rates were lower. Simultaneously, as discussed in Chapter 6 (see 6.3.1), the BMA Covid-19 tracker surveys (BMA, 2021a) undertaken with UK doctors of all grades indicated that more doctors were experiencing mental health difficulties over the 2020/21 winter than in the 2020 summer. This might

suggest that as workload increased, alongside Covid-19 case rates, doctors' opportunities for break taking *and* wellbeing were negatively affected. However, due to multiple differences between the samples and recruitment methods, as well as many other potentially confounding differences, cross-comparison is difficult. Future research could directly investigate measures of wellbeing, workload, and break taking in the same sample of doctors to provide more definitive conclusions.

Another consideration for future observational research is the views and opinions of healthcare service users – including patients and their families and/or visitors. During the course of the broader project on break taking, a relatively small number of participants were recruited to a pilot survey with members of the public ($N=14$; see Appendix A). While the sample size was too small to make definitive conclusions, the small number of participants who were surveyed generally preferred to wait and receive treatment from a rested doctor, than sooner see a doctor who had not taken a break. This is contrary to a popular belief among healthcare professionals that visible break taking would be perceived as unprofessional. Future research could seek the input of a larger group and potentially use other methods (such as social media or online forums) to gain a wider public perspective. A study of this type could be a valuable myth-busting exercise in attempts to deconstruct the prevailing workplace culture which is widely perceived to be incompatible with regular break taking and self-care.

8.4.2 Interventional research

While this project makes suggestions regarding areas for intervention, future research is required to investigate the feasibility and effectiveness of interventions. The systematic review (Chapter 3) found that existing interventional research often entails small sample sizes and moderate-to-severe risk of bias. Future quantitative research should seek to reduce bias as much as possible through experimental design (e.g. randomisation) and/or appropriate statistical techniques to account for confounders.

The findings of this research (Chapters 4-7) have also demonstrated the need to recognise the inherent differences between grades and stages of training, specialties, workplace location and a host of other structural and procedural factors (see 8.2) when seeking to understand break-taking practice and intervention needs. Future research should either focus on groups of doctors with similar profiles (e.g. same training grade and specialty) or measure demographic data with sufficient granularity to account for these factors (e.g. as potential confounding variables).

To address the topic of optimum break-taking strategies and practice, future research could begin by identifying the core outcomes needed to demonstrate effectiveness of breaks for wellbeing and/or job performance. The next priority could be to investigate the effect of 20 to 30 minute breaks in a

UK population of doctors, which is currently prescribed by policy and guidance though, in reality, regularly not possible for doctors. There is also a need to investigate the effectiveness of alternative break durations, activities, locations, degree of socialising, and timing during a shift – as well as doctors' perceptions of their value – to determine optimum break-taking practice for doctors' wellbeing and/or job performance. The use of realist methodology would help evaluate what works, for whom, under what circumstances, and how.

As many structural, procedural, and individual factors interact to affect break taking, it is likely that multi-layered, whole-system interventions will be needed to meaningfully improve break practices. Research is needed to investigate the potential for, and effectiveness of, this type of multi-faceted approach. As the findings of this project suggest an important effect of different contextual conditions or events (e.g. winter pressures, pandemic outbreaks, major incidents) on workload and break-taking practice, comparisons between interventions need to account for this in the design (e.g. conducting studies at similar times of year and under similar levels of clinical demand). Additionally, it might be helpful to use longitudinal designs to assess the effectiveness of interventions at different times of year.

As the findings suggest a collaborative approach should be used in the design, appraisal and implementation of break interventions, it will be important for future research to include as many relevant stakeholders as possible, which have been identified by this research. This not only includes doctors of all grades and specialties but also management of healthcare organisations, policy makers, patients and their family members, rota coordinators, other clinical staff and allied health professionals.

8.5 Implications for policy and practice

From the mixed method data in both pre-pandemic and pandemic phases of this project, it is clear that breaks were considered an important component of doctors' wellbeing. Prior to the Covid-19 outbreak, burnout and ill-being among doctors represented a significant challenge to trusts and national policy makers, with detrimental effects on the retention of an already insufficient number of doctors to serve the needs of the increasing and aging UK population. National surveys show that the pandemic brought about yet higher levels of burnout (GMC, 2021b) and intentions to leave the profession (GMC, 2021a). A study with NHS staff (16% doctors) during the pandemic showed that burnout was significantly affected by the ability to take breaks as well as the ability to rest and recover during breaks (Gemine et al., 2021). Additionally, research with nurses in Germany suggests that regular rest breaks act as a buffer against the effects of understaffing and subsequent staff turnover rates (Wendsche et al., 2017) Despite the potential importance of breaks to wellbeing and

retention of staff, this thesis has shown that doctors were often unable to take them, both prior to and during the pandemic.

With a general lack of existing empirical evidence, current national policy, guidance, and trust initiatives relating to breaks (e.g. Junior Doctor contract, Working Time Regulations) seem to assume that a) successful intrawork break taking is defined by breaks of approximately 20 to 30 minutes, b) this duration should sustain wellbeing and/or job performance, and c) more of these breaks need to be facilitated – which is often addressed through a one-size-fits-all trust-wide intervention. However, the findings of these studies show that doctors are regularly unable to take breaks of this nature and identify a need to go beyond the assumptions of current policy to determine optimum break-taking practices or strategies. However, this will require more attention from national policy makers, trusts, and research funders on the topic of break taking.

The factors with the greatest impact on break-taking practice appear to be those which are externally-imposed structural and/or procedural issues. While policies and trust-level decision making might not be able to fully mitigate the effect of pandemics or other major incidents on healthcare staff wellbeing, there are other structural and procedural level factors such as workload, staffing, rota coordination, organisational culture, and senior presence, which are within their control.

The findings of these studies, taken together, suggest that doctors' priorities consistently differ from those of policy makers and decision makers who implement interventions. Unsurprisingly doctors' priorities for interventions tend to focus on addressing structural, systemic issues; however, interventions currently on offer place the onus for wellbeing on the individual (e.g. resilience training, mindfulness sessions). Additionally, when doctors wish to engage with existing hospital-wide interventions, they often find them inaccessible to doctors. There is a need for co-production at each step of the intervention design and implementation process, with representation from doctors at all levels and from various specialties.

It is also clear that there is a great deal of complexity to be considered and a need to account for a host of structural, procedural, and individual factors in the design and implementation of new policies or interventions. Given the interconnectedness of the barriers described, small-scale singular interventions will likely only 'go so far' in improving break-taking behaviour and a multi-faceted, whole-system approach will likely be needed. While some ambitious singular changes could be successful in achieving better break taking practice (e.g. improved staffing levels or reduced workloads), these are often perceived as financially non-viable for trusts. However, one study (Mitra et al., 2008) found that it is possible to creatively adjust rotas or pair staff together as cover to better facilitate breaks, without the financial implications of recruiting more staff. Unfortunately the

research was judged to be at critical risk of bias. It is therefore possible that with more attention and funding, innovative methods can be found to improve break-taking practice, cultural norms, positively affect wellbeing, and ultimately retain doctors in practice.

8.6 Conclusions

Break taking is a globally under-researched topic, but one that could have important implications for doctors' wellbeing and the issues of staff retention facing UK healthcare settings. This body of work has shown that doctors of all grades consistently perceive breaks as important to their wellbeing and, although the literature is in its infancy and further good-quality evidence is needed, a systematic review of the evidence (O'Neill et al., 2022) suggests positive effects of breaks on wellbeing and job performance indicators. However, the majority of doctors missed their breaks on a daily or weekly basis, both before and during the Covid-19 pandemic. Structural and procedural barriers interact to create an environment that is largely hostile to break taking, but doctors are often delegated the individual responsibility to take breaks. Correspondingly, doctors and decision makers consistently differ in their priorities for interventions, which often target individuals instead of the more significant external, systemic barriers to taking breaks. This thesis has taken important initial steps towards exploring and creating a conceptual model to understand intrawork break taking in UK doctors, prior to and during the Covid-19 pandemic, and has recommended meaningful ways for future research and policy to continue this important work.

Appendix A Public survey

A.1 Method

In September 2019, during the recruitment period for the doctors' survey, members of the public visiting Southampton General Hospital (for any reason), and willing to spare time, were presented with vignettes and surveyed about their opinions on doctors taking breaks in various scenarios. With an inherently diverse population of attendees, this exercise aimed to engage a diverse sample of the Southampton population in the scoping research.

Over a 90-minute period at the hospital's front entrance, three verbal questions were posed to passers-by ($N=9$):

- 1) Would you rather see a tired doctor sooner or wait (whilst s/he takes a break) and see a rested doctor?
- 2) What if you were in A&E?
- 3) *[If applicable] What if you were with your child(ren)? [This could include scenarios where participants were attending for the needs of the child(ren) or the adult]*

If time allowed or if written form was preferred, a survey was completed instead (Appendix J) ($N=5$). To gather a variety of opinions and viewpoints, the written survey consisted of both quantitative and qualitative open-ended questions allowing free-text responses.

Attempts to engage a diverse sample of the public were successful, particularly with regards to age of respondents (age range ~25-80). However, female passers-by were more likely to engage ($N=10$) than males ($N=4$).

A.1.1 Data analysis

Verbal responses to the brief questions were categorised into three response categories/options (yes, no, urgency dependent). Free-text responses to the open-ended survey questions were thematically analysed for recurring responses, categories, and themes and the exceptions to them.

A.2 Results

A.2.1 Verbal vignettes

Responses to the verbal vignettes posed to members of the public are depicted in Figure 23. The majority of respondents were willing to wait whilst a doctor took a break (8/9) though this reduced to just over half (5/9) if attending A&E or where children were present. The remaining participants

mentioned that their willingness to wait whilst a doctor took a break would depend on the urgency of the medical problem and their pain management.

A.2.2 Written survey

Two respondents to the public written survey (2/5) would be willing to wait whilst a doctor took a break, whatever the wait entailed. For one respondent (1/5) it depended on the urgency of the presenting problem. Another (1/5) felt the reason for the delay was irrelevant as they would not be aware of it, simply assuming the doctor was with other patients. One respondent (1/5) was not willing to wait, commenting that doctors’ breaks should be staggered whilst the work is covered by other doctors.

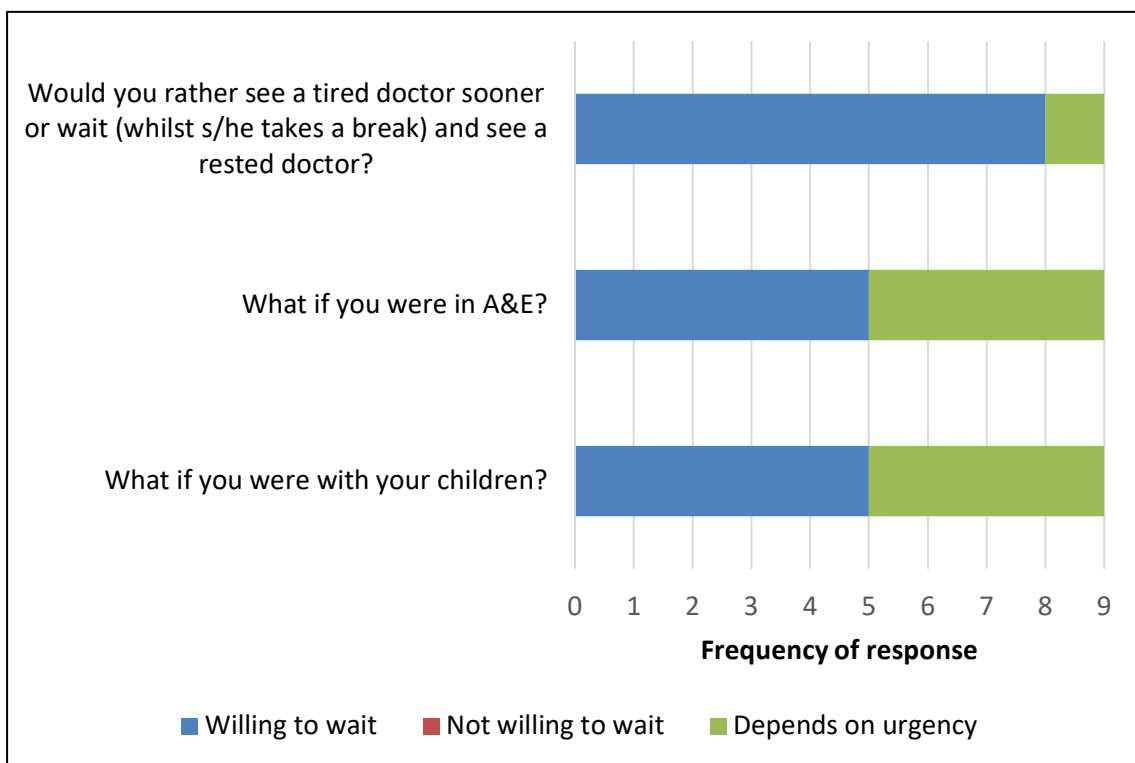


Figure 23 Verbal questions posed to members of the public attending Southampton General Hospital

Willingness to wait was unchanged by a scenario where participants were needed elsewhere imminently. Of those willing to wait, or willing to wait dependent on urgency, two (2/3) were less willing to wait if their child(ren) were present. However, one respondent stated this could be attenuated if appropriately trained/vetted volunteers were present to entertain or care for the child(ren). In a scenario where they were attending A&E instead of routine appointments, only one respondents’ willingness to wait changed, commenting that emergency personnel should have adequate cover to enable them to take breaks and provide immediate response to emergencies.

Appendix A

All respondents to the survey (5/5) felt that taking breaks during shifts is important to doctors' wellbeing. Reasoning comprised three categories: 1) high job demands and stress (2/5), 2) the notion that doctors are human and humans require breaks (4/5), and 3) for safe and effective performance of the job (2/5). All respondents thought doctors worked longer than average work hours (Range: 45-80 hours per week).

All respondents felt that in a 10-hour shift doctors should take breaks accumulating to at least 40 minutes to 1 hour (or more) interspersed throughout the day. When probed as to how they'd feel observing a doctor taking a break, all participants would be unperturbed by it, with several (3/5) commenting that the doctor would be "practicing what they preach" regarding self-care.

A.3 Discussion

In addition to the main factors identified by doctors in Chapters 4-7 of this thesis, another consideration in doctors' break-taking culture is the perceived expectations of patients and the general public. There is a common belief that consuming food or drink on the wards or in clinical areas would appear unprofessional to patients (Royal College of Nursing, 2018). However, all of the members of the public who were surveyed for their opinions responded that they would be unconcerned by the sight of a doctor taking a break, with some highlighting that it would be reassuring to them – a stark contrast to the concerns about perceived professionalism. Whilst the presence of children and urgency of the presenting problem modified willingness to wait for some, the majority of respondents would be willing to wait for non-urgent care whilst their doctor took a break, preferring to see a rested doctor for their care over a tired doctor. All respondents felt that breaks were important to doctors' wellbeing, demonstrating agreement with the doctors' survey responses.

This small-scale engagement exercise provides some evidence to contradict the common perception that if patients observed doctors taking a break, they would perceive the doctors as unprofessional. This type of data could function as evidence for "myth busting" in the attempts to change popular views that encourage a culture of break skipping.

Appendix B Systematic review search strategies

B.1 Ovid Embase Classic + Embase 1947 – 2020 January 06

Line	Search terms
1	exp physician/ OR exp resident/
2	(doctor* OR physician* OR resident*).ab,ti
3	#1 OR #2
4	exp rest/
5	(break OR breakroom OR breaks OR break-time OR break-taking OR doctors mess OR micro-break* OR microbreak* OR nap OR napping OR naps OR rest OR rest-break* OR restful OR resting OR sleep OR sleeping OR work-break*).ab,ti
6	#4 OR #5
7	exp "occupation and occupation related phenomena"/
8	(duty OR duties OR employee* OR employment OR internship* OR job OR jobs OR occupation* OR on-call OR on-shift OR organisation* OR organization* OR profession* OR rotation* OR rota* OR shift OR shifts OR shift-work OR shift-working OR staff OR work OR workday* OR work environment* OR worker* OR workforce OR working OR workload OR workplace OR work-related).ab,ti
9	#7 OR #8
10	#3 AND #6 AND #9
11	exp health/ OR exp wellbeing/ OR exp occupational health/ OR exp medical error/ OR exp work/ OR exp occupational science/
12	(absenteeism OR anxiety OR anxious OR burnout OR depression OR depressive OR employee health OR exhaustion OR fatigue OR mental health OR musculoskeletal OR occupational health OR occupational disease* OR occupational injury OR occupational injuries OR presenteeism OR quality of life OR recovery OR resilience OR resiliency OR sick note* OR sickness absence* OR sickness leave OR sick leave OR sleepiness OR staff absence* OR staff leave OR stress OR tiredness OR turnover OR wakefulness OR well-being OR wellbeing OR well being OR wellness OR well-ness OR work absence*).ab,ti
13	(ability to concentrate OR adverse event* OR alertness OR appraisal* OR assess* performance OR care quality OR claim* by patient* OR care of patient* OR care for patient* OR clinical performance OR clinical outcome* OR competen* at work OR concentration OR consultation satisfaction OR deadline* OR death rate* OR feedback OR fit* to practice OR fit* to practise OR decision-making OR decision making OR industrial safety OR industrial health OR infection rate* OR job dedication OR job effectiveness OR job efficiency OR job engagement OR job motivation OR job performance OR job satisfaction OR job skill* OR job productivity OR medical error* OR medical mistake* OR medical negligenc* OR meet* objective* OR mental acuity OR occupational safety OR organisational citizenship OR organizational citizenship OR patient care OR patient complaint* OR patient claim* OR patient death* OR patient outcome* OR patient mortality OR patient satisfaction OR patient wait* time* OR perform task* OR performance assess* OR prevention uptake rate* OR quality of work OR quality of care OR quality indicat* OR quality of service OR reaction speed* OR reaction time* OR readmission* rate* OR referral rate* OR revalidation OR service provision OR significant event* OR standard* of care OR surgery rate* OR target* OR task performance OR teamwork OR treatment outcome* OR wait* list* OR wait* time* OR work capacity OR working effectively OR working efficiently OR work engagement OR work performance OR work productivity OR work quality).ab,ti
14	("friends and family test*").ab,ti
15	#11 OR #12 OR #13 OR #14

Appendix B

Line	Search terms
16	#10 AND #15

B.2 PubMed

Line	Search terms
1	physician [MeSH] OR "Internship and Residency"[MeSH]
2	doctor*[Title/Abstract] OR physician*[Title/Abstract] OR resident* [Title/Abstract]
3	#1 OR #2
4	"rest"[MeSH]
5	break[Title/Abstract] OR breakroom[Title/Abstract] OR breaks OR breaktime[Title/Abstract] OR break-taking[Title/Abstract] OR "doctors mess"[Title/Abstract] OR "doctor's mess"[Title/Abstract] OR micro-break*[Title/Abstract] OR microbreak*[Title/Abstract] OR nap[Title/Abstract] OR napping[Title/Abstract] OR naps[Title/Abstract] OR rest[Title/Abstract] OR rest-break*[Title/Abstract] OR restful[Title/Abstract] OR resting[Title/Abstract] OR sleep[Title/Abstract] OR sleeping[Title/Abstract] OR work-break*[Title/Abstract]
6	#4 OR #5
7	work[MeSH] OR workplace[MeSH]
8	duty[Title/Abstract] OR duties[Title/Abstract] OR employee*[Title/Abstract] OR employment[Title/Abstract] OR internship*[Title/Abstract] OR job[Title/Abstract] OR jobs[Title/Abstract] OR occupation*[Title/Abstract] OR on-call[Title/Abstract] OR on-shift[Title/Abstract] OR organisation*[Title/Abstract] OR organization*[Title/Abstract] OR profession*[Title/Abstract] OR rotation*[Title/Abstract] OR rota*[Title/Abstract] OR shift[Title/Abstract] OR shifts[Title/Abstract] OR shift-work[Title/Abstract] OR shift-working[Title/Abstract] OR staff[Title/Abstract] OR work[Title/Abstract] OR workday*[Title/Abstract] OR "work environment*" [Title/Abstract] OR worker* OR workforce[Title/Abstract] OR working[Title/Abstract] OR workload[Title/Abstract] OR workplace[Title/Abstract] OR work-related[Title/Abstract]
9	#7 OR #8
10	#3 AND #6 AND #9
11	"occupational health"[MeSH] OR "mental health"[MeSH] OR "medical errors"[MeSH] OR "work performance"[MeSH]
12	absenteeism[Title/Abstract] OR anxiety[Title/Abstract] OR anxious[Title/Abstract] OR burnout[Title/Abstract] OR depression[Title/Abstract] OR depressive[Title/Abstract] OR employee health[Title/Abstract] OR exhaustion[Title/Abstract] OR fatigue[Title/Abstract] OR mental health[Title/Abstract] OR musculoskeletal[Title/Abstract] OR occupational health[Title/Abstract] OR occupational disease*[Title/Abstract] OR occupational injury[Title/Abstract] OR occupational injuries[Title/Abstract] OR presenteeism[Title/Abstract] OR quality of life[Title/Abstract] OR recovery[Title/Abstract] OR resilience[Title/Abstract] OR resiliency[Title/Abstract] OR sick note*[Title/Abstract] OR sickness absence*[Title/Abstract] OR sickness leave[Title/Abstract] OR sick leave[Title/Abstract] OR sleepiness[Title/Abstract] OR staff absence*[Title/Abstract] OR staff leave[Title/Abstract] OR stress[Title/Abstract] OR tiredness[Title/Abstract] OR turnover[Title/Abstract] OR wakefulness[Title/Abstract] OR well-being[Title/Abstract] OR wellbeing[Title/Abstract] OR well being[Title/Abstract] OR wellness[Title/Abstract] OR well-ness[Title/Abstract] OR work absence*[Title/Abstract]

Appendix B

Line	Search terms
13	ability to concentrate[Title/Abstract] OR adverse event*[Title/Abstract] OR alertness[Title/Abstract] OR appraisal*[Title/Abstract] OR assess* performance[Title/Abstract] OR care quality[Title/Abstract] OR claim* by patient*[Title/Abstract] OR care of patient*[Title/Abstract] OR care for patient*[Title/Abstract] OR clinical performance[Title/Abstract] OR clinical outcome*[Title/Abstract] OR competen* at work[Title/Abstract] OR concentration[Title/Abstract] OR consultation satisfaction[Title/Abstract] OR deadline*[Title/Abstract] OR death rate*[Title/Abstract] OR feedback[Title/Abstract] OR fit* to practice[Title/Abstract] OR fit* to practise[Title/Abstract] OR decision-making[Title/Abstract] OR decision making[Title/Abstract] OR industrial safety[Title/Abstract] OR industrial health[Title/Abstract] OR infection rate*[Title/Abstract] OR job dedication[Title/Abstract] OR job effectiveness[Title/Abstract] OR job efficiency[Title/Abstract] OR job engagement[Title/Abstract] OR job motivation[Title/Abstract] OR job performance[Title/Abstract] OR job satisfaction[Title/Abstract] OR job skill*[Title/Abstract] OR job productivity[Title/Abstract] OR medical error*[Title/Abstract] OR medical mistake*[Title/Abstract] OR medical negligenc*[Title/Abstract] OR meet* objective*[Title/Abstract] OR mental acuity[Title/Abstract] OR occupational safety[Title/Abstract] OR organisational citizenship[Title/Abstract] OR organizational citizenship[Title/Abstract] OR patient care[Title/Abstract] OR patient complaint*[Title/Abstract] OR patient claim*[Title/Abstract] OR patient death*[Title/Abstract] OR patient outcome*[Title/Abstract] OR patient mortality[Title/Abstract] OR patient satisfaction[Title/Abstract] OR patient wait* time*[Title/Abstract] OR perform task*[Title/Abstract] OR performance assess*[Title/Abstract] OR prevention uptake rate*[Title/Abstract] OR quality of work[Title/Abstract] OR quality of care[Title/Abstract] OR quality indicat*[Title/Abstract] OR quality of service[Title/Abstract] OR reaction speed*[Title/Abstract] OR reaction time*[Title/Abstract] OR readmission* rate*[Title/Abstract] OR referral rate*[Title/Abstract] OR revalidation[Title/Abstract] OR service provision[Title/Abstract] OR significant event*[Title/Abstract] OR standard* of care[Title/Abstract] OR surgery rate*[Title/Abstract] OR target*[Title/Abstract] OR task performance[Title/Abstract] OR teamwork[Title/Abstract] OR treatment outcome*[Title/Abstract] OR wait* list*[Title/Abstract] OR wait* time*[Title/Abstract] OR work capacity[Title/Abstract] OR working effectively[Title/Abstract] OR working efficiently[Title/Abstract] OR work engagement[Title/Abstract] OR work performance[Title/Abstract] OR work productivity[Title/Abstract] OR work quality[Title/Abstract] OR “friends and family test*”[Title/Abstract]
14	#11 OR #12 OR #13
15	#10 AND #14

B.3 Web of Science

Line	Search terms
	<i>(Topic search selected)</i>
1	doctor* OR physician* OR resident*
2	break OR breakroom OR breaks OR “break-time” OR “break-taking” OR “doctors mess” OR “micro-break*” OR microbreak* OR nap OR napping OR naps OR rest OR “rest-break*” OR restful OR resting OR sleep OR sleeping OR “work-break*”
3	duty OR duties OR employee* OR employment OR internship* OR job OR jobs OR occupation* OR “on-call” OR “on-shift” OR organisation* OR organization* OR profession* OR rotation* OR rota* OR shift OR shifts OR “shift-work” OR “shift-working” OR staff OR work OR workday* OR “work environment*” OR worker* OR workforce OR working OR workload OR workplace OR “work-related”
4	#1 AND #2 AND #3 = 5,854

Appendix B

Line	Search terms
5	#5 absenteeism OR anxiety OR anxious OR burnout OR depression OR depressive OR "employee health" OR exhaustion OR fatigue OR "mental health" OR musculoskeletal OR "occupational health" OR "occupational disease*" OR "occupational injury" OR "occupational injuries" OR presenteeism OR "quality of life" OR recovery OR resilience OR resiliency OR "sick note*" OR "sickness absence*" OR "sickness leave" OR "sick leave" OR sleepiness OR "staff absence*" OR "staff leave" OR stress OR tiredness OR turnover OR wakefulness OR "well-being" OR wellbeing OR "well being" OR wellness OR "well-ness" OR "work absence*"
6	"ability to concentrate" OR "adverse event*" OR alertness OR appraisal* OR "assess* performance" OR "care quality" OR "claim* by patient*" OR "care of patient*" OR "care for patient*" OR "clinical performance" OR "clinical outcome*" OR "competen* at work" OR concentration OR "consultation satisfaction" OR deadline* OR "death rate*" OR "decision-making" OR "decision making" OR feedback OR "fit* to practice" OR "fit* to practise" OR "friends and family test*" OR "industrial safety" OR "industrial health" OR "infection rate*" OR "job dedication" OR "job effectiveness" OR "job efficiency" OR "job engagement" OR "job motivation" OR "job performance" OR "job satisfaction" OR "job skill*" OR "job productivity" OR "medical error*" OR "medical mistake*" OR "medical negligenc*" OR "meet* objective*" OR "mental acuity" OR "occupational safety" OR "organisational citizenship" OR "organizational citizenship" OR "patient care" OR "patient complaint*" OR "patient claim*" OR "patient death*" OR "patient outcome*" OR "patient mortality" OR "patient satisfaction" OR "patient wait* time*" OR "perform task*" OR "performance assess*" OR "prevention uptake rate*" OR "quality of work" OR "quality of care" OR "quality indicat*" OR "quality of service" OR "reaction speed*" OR "reaction time*" OR "readmission* rate*" OR "referral rate*" OR revalidation OR "service provision" OR "significant event*" OR "standard* of care" OR "surgery rate*" OR target* OR "task performance" OR teamwork OR "treatment outcome*" OR "wait* list*" OR "wait* time*" OR "work capacity" OR "working effectively" OR "working efficiently" OR "work engagement" OR "work performance" OR "work productivity" OR "work quality"
7	#5 OR #6
8	#4 AND #7

B.4 PsycINFO

Line	Search terms
1	DE "Physicians" OR DE "Family Physicians" OR DE "General Practitioners" OR DE "Gynecologists" OR DE "Internists" OR DE "Neurologists" OR DE "Obstetricians" OR DE "Pathologists" OR DE "Pediatricians" OR DE "Psychiatrists" OR DE "Surgeons" OR DE "medical residency" OR DE "medical internship"
2	TI doctor* OR TI physician* OR AB doctor* OR AB physician* OR TI resident* OR AB resident*
3	S1 OR S2
4	DE "Relaxation" OR DE "Work Rest Cycles"
5	TI break OR TI breakroom OR TI breaks OR TI "break-time" OR TI "break-taking" OR TI "doctors mess" OR TI "micro-break*" OR TI microbreak* OR TI nap OR TI napping OR TI naps OR TI rest OR TI "rest-break*" OR TI restful OR TI resting OR TI sleep OR TI sleeping OR TI "work-break*" OR AB break OR AB breakroom OR AB breaks OR AB "break-time" OR AB "break-taking" OR AB "doctors mess" OR AB "micro-break*" OR AB microbreak* OR AB nap OR AB napping OR AB naps OR AB rest OR AB "rest-break*" OR AB restful OR AB resting OR AB sleep OR AB sleeping OR AB "work-break*"
6	S4 OR S5
7	#DE "Working Conditions" OR "Workday Shifts" OR DE "Working Space"

Appendix B

Line	Search terms
8	TI duty OR TI duties OR TI employee* OR TI employment OR TI internship* OR TI job OR TI jobs OR TI occupation* OR TI "on-call" OR TI "on-shift" OR TI organisation* OR TI organization* OR TI profession* OR TI rotation* OR TI rota* OR TI shift OR TI shifts OR TI "shift-work" OR TI "shift-working" OR TI staff OR TI work OR TI workday* OR TI "work environment*" OR TI worker* OR TI workforce OR TI working OR TI workload OR TI workplace OR TI "work-related" OR AB duty OR AB duties OR AB employee* OR AB employment OR AB internship* OR AB job OR AB jobs OR AB occupation* OR AB "on-call" OR AB "on-shift" OR AB organisation* OR AB organization* OR AB profession* OR AB rotation* OR AB rota* OR AB shift OR AB shifts OR AB "shift-work" OR AB "shift-working" OR AB staff OR AB work OR AB workday* OR AB "work environment*" OR AB worker* OR AB workforce OR AB working OR AB workload OR AB workplace OR AB "work-related"
9	S7 OR S8
10	S3 AND S6 AND S9 = 1,702
11	DE "Health Status" OR DE "Health Literacy" OR DE "Health Outcomes" OR DE "Mental Health" OR DE "Occupational Health" OR DE "Physical Health" OR DE "Well Being" OR DE "Spiritual Well Being" OR DE "Errors" OR DE "Patient Safety" OR DE "Job Performance" OR DE "Employee Efficiency" OR DE "Employee Productivity" OR DE "Job Satisfaction"
12	TI absenteeism OR TI anxiety OR TI anxious OR TI burnout OR TI depression OR TI depressive OR TI "employee health" OR TI exhaustion OR TI fatigue OR TI "mental health" OR TI musculoskeletal OR TI "occupational health" OR TI "occupational disease*" OR TI "occupational injury" OR TI "occupational injuries" OR TI presenteeism OR TI "quality of life" OR TI recovery OR TI resilience OR TI resiliency OR TI "sick note*" OR TI "sickness absence*" OR TI "sickness leave" OR TI "sick leave" OR TI sleepiness OR TI "staff absence*" OR TI "staff leave" OR TI stress OR TI tiredness OR TI turnover OR TI wakefulness OR TI "well-being" OR TI wellbeing OR TI "well being" OR TI wellness OR TI "well-ness" OR TI "work absence*" OR AB absenteeism OR AB anxiety OR AB anxious OR AB burnout OR AB depression OR AB depressive OR AB "employee health" OR AB exhaustion OR AB fatigue OR AB "mental health" OR AB musculoskeletal OR AB "occupational health" OR AB "occupational disease*" OR AB "occupational injury" OR AB "occupational injuries" OR AB presenteeism OR AB "quality of life" OR AB recovery OR AB resilience OR AB resiliency OR AB "sick note*" OR AB "sickness absence*" OR AB "sickness leave" OR AB "sick leave" OR AB sleepiness OR AB "staff absence*" OR AB "staff leave" OR AB stress OR AB tiredness OR AB turnover OR AB wakefulness OR AB "well-being" OR AB wellbeing OR AB "well being" OR AB wellness OR AB "well-ness" OR AB "work absence*"

Appendix B

Line	Search terms
13	<p>TI “ability to concentrate” OR TI “adverse event*” OR TI alertness OR TI appraisal* OR TI “assess* performance” OR TI “care quality” OR TI “claim* by patient*” OR TI “care of patient*” OR TI “care for patient*” OR TI “clinical performance” OR TI “clinical outcome*” OR TI “competen* at work” OR TI concentration OR TI “consultation satisfaction” OR TI deadline* OR TI “death rate*” OR TI “decision-making” OR TI “decision making” OR TI feedback OR TI “fit* to practice” OR TI “fit* to practise” OR TI “friends and family test*” OR TI “industrial safety” OR TI “industrial health” OR TI “infection rate*” OR TI “job dedication” OR TI “job effectiveness” OR TI “job efficiency” OR TI “job engagement” OR TI “job motivation” OR TI “job performance” OR TI “job satisfaction” OR TI “job skill*” OR TI “job productivity” OR TI “medical error*” OR TI “medical mistake*” OR TI “medical negligenc*” OR TI “meet* objective*” OR TI “mental acuity” OR TI “occupational safety” OR TI “organisational citizenship” OR TI “organizational citizenship” OR TI “patient care” OR TI “patient complaint*” OR TI “patient claim*” OR TI “patient death*” OR TI “patient outcome*” OR TI “patient mortality” OR TI “patient satisfaction” OR TI “patient wait* time*” OR TI “perform task*” OR TI “performance assess*” OR TI “prevention uptake rate*” OR TI “quality of work” OR TI “quality of care” OR TI “quality indicat*” OR TI “quality of service” OR TI “reaction speed*” OR TI “reaction time*” OR TI “readmission* rate*” OR TI “referral rate*” OR TI revalidation OR TI “service provision” OR TI “significant event*” OR TI “standard* of care” OR TI “surgery rate*” OR TI target* OR TI “task performance” OR TI teamwork OR TI “treatment outcome*” OR TI “wait* list*” OR TI “wait* time*” OR TI “work capacity” OR TI “work* effectively” OR TI “work* efficiently” OR TI “work engagement” OR TI “work performance” OR TI “work productivity” OR TI “work quality” OR AB “ability to concentrate” OR AB “adverse event*” OR AB alertness OR AB appraisal* OR AB “assess* performance” OR AB “care quality” OR AB “claim* by patient*” OR AB “care of patient*” OR AB “care for patient*” OR AB “clinical performance” OR AB “clinical outcome*” OR AB “competen* at work” OR AB concentration OR AB “consultation satisfaction” OR AB deadline* OR AB “death rate*” OR AB “decision-making” OR AB “decision making” OR AB feedback OR AB “fit* to practice” OR AB “fit* to practise” OR AB “friends and family test*” OR AB “industrial safety” OR AB “industrial health” OR AB “infection rate*” OR AB “job dedication” OR AB “job effectiveness” OR AB “job efficiency” OR AB “job engagement” OR AB “job motivation” OR AB “job performance” OR AB “job satisfaction” OR AB “job skill*” OR AB “job productivity” OR AB “medical error*” OR AB “medical mistake*” OR AB “medical negligenc*” OR AB “meet* objective*” OR AB “mental acuity” OR AB “occupational safety” OR AB “organisational citizenship” OR AB “organizational citizenship” OR AB “patient care” OR AB “patient complaint*” OR AB “patient claim*” OR AB “patient death*” OR AB “patient outcome*” OR AB “patient mortality” OR AB “patient satisfaction” OR AB “patient wait* time*” OR AB “perform task*” OR AB “performance assess*” OR AB “prevention uptake rate*” OR AB “quality of work” OR AB “quality of care” OR AB “quality indicat*” OR AB “quality of service” OR AB “reaction speed*” OR AB “reaction time*” OR AB “readmission* rate*” OR AB “referral rate*” OR AB revalidation OR AB “service provision” OR AB “significant event*” OR AB “standard* of care” OR AB “surgery rate*” OR AB target* OR AB “task performance” OR AB teamwork OR AB “treatment outcome*” OR AB “wait* list*” OR AB “wait* time*” OR AB “work capacity” OR AB “work* effectively” OR AB “work* efficiently” OR AB “work engagement” OR AB “work performance” OR AB “work productivity” OR AB “work quality”</p>
14	#11 OR #12 OR #13
15	#10 AND #14

B.5 Google Scholar checks

Line	Search terms
1	~doctor OR ~physician AND ~break
2	~doctor OR ~physician AND ~"rest break"
3	(~doctor OR ~physician) AND ~break AND (~wellbeing OR ~performance)
4	(~doctor OR ~physician) AND ~"rest break" AND (~wellbeing OR ~performance)

Appendix C Rationale for JBI checklist risk of bias ratings

C.1 Rationale for risk of bias assessments for observational cohort studies

C.1.1 Berastegui (2020)

Question	Comments
Q1	No control/ comparison group
Q2	No control/ comparison group
Q3	Study specific qualitative tool (list of fatigue reduction strategies), validity unclear. Not objective.
Q4	No mention of covariates, no confounders identified.
Q5	Model allowed control of variance from random factors
Q6	Participants not free of outcomes prior to study commencement
Q7	Validity of outcomes unclear. However, measured in a reliable way
Q8	Several repeated measurements of reaction time (sufficient). Burnout measured once at baseline.
Q9	Authors mention there was staff turnover and new participants recruited but unclear whether this affected follow-up of the longitudinal variables
Q10	Rationale as above in question 9.
Q11	Statistics appear appropriate for data

C.1.2 Hockey (2020)

Question	Comments
Q1	No control/ comparison group
Q2	No control/ comparison group
Q3	Time spent on task (breaks). Objective and reliably measured.
Q4	Analysis controlled for demographic data, time at which the task (breaks) was performed and the minutes since it was started.
Q5	Rationale as above in Q4
Q6	Participants not free of outcomes prior to study commencement
Q7	Validation studies completed showing acceptable validity

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Question	Comments
Q8	5x 2-hour periods selected across shifts (sufficient).
Q9	All survey responses included, regardless of quantity of surveys completed. When incomplete task data was excluded, other data from survey included.
Q10	Rationale as above in Q9.
Q11	Statistics appear appropriate for data

C.1.3 Neprash (2018)

Question	Comments
Q1	No control/ comparison group
Q2	No control/ comparison group
Q3	Objective and reliably measured. (Gap of >15 minutes in schedule)
Q4	Analysis controlled for demographic characteristics, visit characteristics and differences across physicians
Q5	As above in Q4.
Q6	Participants not free of outcome prior to study commencement
Q7	Objective and reliable measurement (of inappropriate opioid prescription).
Q8	12-month period (sufficient)
Q9	Not applicable to retrospective cohort studies
Q10	Not applicable to retrospective cohort studies
Q11	Statistics appear appropriate for data

C.1.4 Vosshehrich (2021)

Question	Comments
Q1	No control/ comparison group
Q2	No control/ comparison group
Q3	Method of defining breaks does not appear reliable. Authors assume 45-min breaks taken before/after teaching at noon, when staff overlap on weekend shifts, and inconsistently on night shifts. Then split data into 2-hour blocks (10:00-11:59am, 12-1:59pm, etc.) and approximate reports which might be close to lunch times.

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Question	Comments
Q4	Proofreading behaviour consistency among staff was analysed (potential confounder). State that inclusion of a large number of cross-sectional imaging studies might exacerbate decreases in mean report similarity
Q5	Impact of cross-sectional imaging identified as confounder but not considered in analysis. Proofreading consistency over course of a day (e.g. morning vs afternoon) assumed.
Q6	Participants not free of outcome prior to study commencement
Q7	Objective, reliable. (Jaccard similarity coefficient)
Q8	2.5 year period (sufficient).
Q9	Not applicable to retrospective cohort studies
Q10	Not applicable to retrospective cohort studies
Q11	Statistics appear appropriate for data

C.2 Rationale for risk of bias assessments for cross-sectional studies

C.2.1 Al Dandan (2020)

Question	Comments
Q1	Inclusion criteria defined
Q2	Subjects described in adequate detail
Q3	Break frequency and duration measured using arbitrary study-specific time categories.
Q4	As above in Q3.
Q5	Confounding factors identified
Q6	Confounders not dealt with statistically. Used multivariate logistic regression but it did not account for certain inherent confounders (e.g. mobile usage and type of corrective lenses)
Q7	Although eye strain not diagnosed objectively, scale used was tested for face validity etc.
Q8	Statistics appear appropriate for data

C.2.2 Hassan (2020)

Question	Comments
Q1	Inclusion criteria defined

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Question	Comments
Q2	Subjects described in adequate detail
Q3	The original, validated survey does not include questions about breaks. This is an additional component without psychometric data.
Q4	As above in Q3.
Q5	No confounders identified
Q6	As above in Q5.
Q7	Stress as outcome measurement on the original HCJSSQ is validated.
Q8	Statistics appear appropriate for data

C.2.3 Kalboussi (2020)

Question	Comments
Q1	Inclusion criteria defined
Q2	Subjects described in adequate detail
Q3	Breaks measured as dichotomised yes/no variable. Not clear how this was measured or defined.
Q4	As above in Q3.
Q5	Confounders identified
Q6	Analysis does not appear to take confounders into account
Q7	Used validated measures of burnout
Q8	Only description for analyses was 'univariate analysis'

C.2.4 Kirkcaldy (2002)

Question	Comments
Q1	Inclusion criteria defined
Q2	Subjects described in adequate detail
Q3	Break duration measured as time of break onset and time of break cessation. Appears objective and reliable.
Q4	As above in Q3.
Q5	Confounders identified and methods (e.g. recruitment, statistics) were used to control for these.
Q6	As above in Q5.
Q7	Criterion validity measured/established for the measure of stress

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Question	Comments
Q8	Statistics appear appropriate for data

C.2.5 Nitszche (2017)

Question	Comments
Q1	Inclusion criteria defined
Q2	Subjects described in adequate detail
Q3	Study-specific single question on recovery opportunities with Likert-type rating. Not validated, not objective or standardised measure.
Q4	As above in Q3.
Q5	Confounders identified in limitations
Q6	While SEM and multivariate equations should account for confounders, it appears the author did not put these into the equation.
Q7	Burnout, work-home conflict and home-work conflict measured using established, validated and reliable measures
Q8	Statistics appear appropriate for data

C.2.6 Ohlander (2015)

Question	Comments
Q1	Inclusion criteria defined
Q2	Subjects described in adequate detail
Q3	Breaks measured in minutes per day. Appears objective and reliable.
Q4	As above in Q3.
Q5	Confounders identified
Q6	Statistics accounted for apriori confounders.
Q7	Work stress measured on validated effort-reward imbalance questionnaire
Q8	Statistics appear appropriate for data

C.2.7 Winston (2008)

Question	Comments
Q1	Inclusion criteria defined

Question	Comments
Q2	Subjects described in adequate detail
Q3	Not clear how break prevalence was measured. Lack of breaks listed as an option on a checklist of barriers to healthy eating.
Q4	Does not appear to be validated or objective.
Q5	Confounders identified
Q6	Variables that could affect healthy eating are descriptively measured but break-taking analyses do not appear to account for confounding factors
Q7	Study specific questionnaire used to select perceived barriers
Q8	Statistics appear appropriate for data

C.3 Rationale for risk of bias assessments for qualitative studies

C.3.1 Hall (2018)

Question	Comments
Q1	Philosophical perspective and methodology congruent
Q2	Methodology and research objectives congruent
Q3	Methodology and methods congruent
Q4	Methodology and analysis congruent
Q5	Methodology and interpretation congruent
Q6	Partially. Acknowledges “the first author’s realist epistemological approach”.
Q7	No mention of implications of above (Q6)
Q8	Voices of participants adequately represented
Q9	Ethical approval granted
Q10	Conclusions appropriate

C.3.2 Lemaire (2011)

Question	Comments
Q1	Unknown - No statement about philosophical or theoretical perspective
Q2	Methodology and research objectives congruent

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Question	Comments
Q3	Methodology and methods congruent
Q4	Methodology and analysis congruent
Q5	Methodology and interpretation congruent
Q6	Acknowledges that interviewer was female internal medicine consultant, clinical professor, a colleague, and Vice Chair of Physician Wellness and Vitality
Q7	No mention of implications of above (Q6)
Q8	Voices of participants adequately represented
Q9	Ethical approval granted
Q10	Conclusions appropriate

C.3.3 Lockhart (2013)

Question	Comments
Q1	Unknown - No statement about philosophical or theoretical perspective
Q2	Methodology and research objectives congruent
Q3	Methodology and methods congruent
Q4	Methodology and analysis congruent
Q5	Methodology and interpretation congruent
Q6	No statement about the researchers' cultural or theoretical perspectives
Q7	While an anonymous survey was used and researcher shouldn't theoretically have an influence, there were only 5 participants in the intervention so it is potentially more open to influence. Unclear from abstract information alone if this could affect results.
Q8	Unknown - Insufficient information in the abstract
Q9	Unknown - Insufficient information in the abstract
Q10	Conclusions appropriate

C.3.4 Morrow (2014)

Question	Comments
Q1	Unknown - No statement about philosophical or theoretical perspective
Q2	Methodology and research objectives congruent

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Question	Comments
Q3	Methodology and methods congruent
Q4	Methodology and analysis congruent
Q5	Methodology and interpretation congruent
Q6	No statement about the researchers' cultural or theoretical perspectives
Q7	Influence of researcher not addressed
Q8	Voices of participants adequately represented
Q9	Ethical approval granted
Q10	Conclusions appropriate

C.3.5 O'Shea (2020)

Question	Comments
Q1	Unknown - No statement about philosophical or theoretical perspective
Q2	Methodology and research objectives congruent
Q3	Methodology and methods congruent
Q4	Methodology and analysis congruent
Q5	Methodology and interpretation congruent
Q6	No statement about the researchers' cultural or theoretical perspectives
Q7	Explains that faculty members known by participants were moderators for focus groups which could have influenced their answers
Q8	Voices of participants adequately represented
Q9	Ethical approval granted
Q10	Conclusions appropriate

C.3.6 Walsh (2005)

Question	Comments
Q1	Unknown - No statement about philosophical or theoretical perspective
Q2	Methodology and research objectives congruent
Q3	Methodology and methods congruent

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Question	Comments
Q4	Methodology and analysis congruent
Q5	Methodology and interpretation congruent
Q6	No statement about the researchers' cultural or theoretical perspectives
Q7	Influence of researcher not addressed
Q8	Voices of participants adequately represented
Q9	Ethical approval granted
Q10	Conclusions appropriate

C.3.7 Wilkesmann (2016)

Question	Comments
Q1	Lots of theoretical context in the introduction (e.g. known unknowns, known knowns etc.) but no statement of philosophical perspective
Q2	Methodology and research objectives congruent
Q3	Methodology and methods congruent
Q4	Methodology and analysis congruent
Q5	Methodology and interpretation congruent
Q6	No statement about the researchers' cultural or theoretical perspectives
Q7	Influence of researcher not addressed
Q8	While the qualitative data does show some evidence of quotes for the two overarching themes (hiding ignorance and sharing ignorance) there is not much evidence of participant voices in the hypotheses building
Q9	Unknown – statement about ethical approvals not given
Q10	Conclusions appropriate

Appendix D Summary of findings for studies included in the systematic review

D.1 Quantitative studies

D.1.1 Standard 30-minute break interventions

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Coburn (2006) Germany Published report	Double blind randomised cross-over trial. Minimum 28 days between crossover phases	N=30 anaesthesia residents; 63.3% Male	30-min breaks in a recreation room vs no break during 7.5 hr shifts	<i>Measured at 7:30 and 14:00:</i> 1) Test for Attentional Performance 2) Stanford Sleepiness Scale 3) State-Trait Anxiety Inventory	N.S difference between break or control on divided attention, working memory, sleepiness or self-reported anxiety
Mitra (2008) Australia Published report	Before-and-after study over 4-week period (2-week baseline phase, 2-week intervention phase)	N=121 baseline and N=112 post-intervention surveys from ED doctors of all grades M/F ratio not reported	Baseline/usual practice phase vs promotion of 30-min uninterrupted breaks (facilitated by cover doctor, educational sessions and posters)	<i>Completed at the end of every shift:</i> 1) Number of breaks and duration 2) Visual analogue tiredness rating 3) Fatigue Severity Scale 4) Routine departmental performance indicators	1) Break-taking prevalence improved from 33% to 60% 2) Subjective tiredness at end of shift reduced when break taken (p<.001) 3) N.S reduction in objective fatigue levels at end of shift when break taken (p=.065) 4) Triage time, time to be seen, time to ward admission, and admissions to wards within target times improved (p<.001)

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D.1.2 Sleep-related interventions

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Amin (2012) USA Published report	Cluster non-randomised controlled trial. Single-day protocol. Intervention and control groups 1 year apart	N=29 1 st year internal medicine residents; n=19 intervention, n=11 control; 58.6% Male	20-min midday naps in a recliner chair during daytime shifts vs controls who lay in chair but conversed with researcher for 20 min	<i>Measured before and after intervention:</i> 1) Conner's Continuous Performance Test (CPTII) 2) Attentional failures (EEG) 3) Average sleep duration during intervention (EEG)	1) Cognitive functioning improved in nap group compared with control (Hit reaction time p=.004; Omission rate p=.01; Commission rate p=.007) 2) Attentional failures decreased in nap group and increased in control group (p=.002) 3) 8.4 +/- 3 mins
Smith-Coggins (2006) USA Published report	Randomised control trial. 2-day protocol: baseline shift and shift with intervention	N=49 ED staff (n=25 doctors, n=24 nurses); n=26 intervention, n=23 control; 32.7% Male	40-min nap opportunity at 3AM during a 12-hr night shift vs continued work	<i>Measured before shift (BS-6:30pm), post-intervention (PI-4am) and after shift (AS-7:30am) on baseline and intervention day:</i> 1) Psychomotor Vigilance Task 2) Probe Recall Memory Task 3) IV simulation (CathSim) 4) Profile of Mood States 5) Karolinska Sleepiness Scale 6) Driving simulation (StiSim Drive Simulation System) <i>Measured during nap (3am):</i> 7) Average sleep duration and onset (EOG)	1) No differences except AS-7:30am: Nap group had fewer lapses (p<.03) and faster reaction time (p<.05) 2) No differences except PI-4am when nap group worsened after nap (p<.05) 3) BS-6:30pm Control group quicker (p<.04), AS-7:30am nap group N.S. quicker (p=0.10) 4) AS-7:30am nap group had less fatigue (p<.05) and more vigor (p<.03) 5) AS-7:30am Less sleepiness (p<.03) in nap group 6) Nap group improved dangerous driving and alertness from baseline, control group worsened from baseline (p<.03). No aggregate group differences on intervention day. 7) Average nap time: 24.8 mins (SD=11.1) Average sleep onset: 8.9 mins (SD=5.5)

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D.1.3 Yoga and mindfulness interventions

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Babbar (2019) USA Published report	Before-and-after study conducted over 8-week period	N=25 OBGYN residents and maternal-fetal medicine fellows; M/F ratio not reported	Weekly 1-hr yoga sessions held within protected education time	<i>Measured before and after 8-week intervention:</i> 1) Maslach Burnout Inventory 2) Depression Anxiety Stress Scale 3) Five Facet Mindfulness Questionnaire 4) Blood pressure (BP) 5) Heart rate 6) Average weight 7) Feedback survey on program	1) Reduction in depersonalization domain (p=.04). N.S. difference in other 2 domains. 2) Anxiety rates reduced (40% to 28%), stress rates reduced (40% to 24%), no difference in depression. 3) 1/5 domains increased (p=.01). N.S difference in total mindfulness. N.S difference between frequent and infrequent yoga attendees. 4) Systolic and diastolic BP decreased (p=.01). Greater decrease in frequent attendees (p=.04) 5) N.S difference. 6) Increased (p=.03). 7) 74% agreed protected wellness with colleagues improved training experience and felt more appreciated. 83% felt increased sense of camaraderie and more motivated to incorporate wellness in their lives. 90% became more aware of physical activity.
Babbar (2021)* USA Published report *Note: Follow-up to Babbar 2019	Before-and-after study conducted over 8-wk period	N=13 OBGYN residents and maternal-fetal medicine fellows; M/F ratio not reported	Weekly 1-hr yoga sessions held within protected education time	1) Daily objective sleep data (Polar A370 fitness tracker) 2) Baseline and post-intervention subjective sleep data (Pittsburgh Sleep Quality Index)	1) On yoga days, attendees had greater total (p = 0.04) and restful sleep (p=0.01) than non-attendees. Compared with non-yoga days, attendees had greater total (p=0.05) and restful sleep (p = 0.04) the night following yoga class. 2) N.S changes
Ireland (2017) Australia Published report	Randomised control trial conducted over 10-week period	N=44 EM interns; n=23 intervention, n=21 control; 36% Male	Wkly 1-hr mindfulness sessions for 10 wks vs 1-hr midday break per wk	<i>Measured at beginning (week1), middle (week 5), and end (week 10) of intervention:</i> 1) Perceived Stress Scale 2) Copenhagen Burnout Inventory	1) Intervention group stress decreased over time (p=.007, $\eta^2=0.28$). Control group stress N.S increased over time (p=0.302, $\eta^2=0.08$). 2) Intervention group burnout N.S improved over time (p=.072, $\eta^2=0.16$); Control group burnout N.S. increased over time (p=0.222; $\eta^2=0.10$)
Scheid (2020) USA Published report	Before-and-after study (6-wk)	N=12 faculty physicians; 0% Male	Baseline/usual practice vs weekly 1-hr yoga sessions for	<i>Measured at baseline, post-intervention and 2 months post-intervention:</i>	<i>Between baseline and post-intervention:</i> Significant improvements in perceived stress (p=.031), anxiety (p=.045), depression (p=.029), resilience (p=.005), professional

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
	intervention period)		6 wks during work hrs	1) Professional fulfilment and burnout (Stanford Professional Fulfilment Index); 2) Perceived Stress Scale 3) Resilience Scale; 4) Anxiety, depression and sleep disturbances (Patient-Reported Outcomes Measurement Information System) 5) Positive and Negative Affect Schedule; 6) Five Facet Mindfulness Questionnaire	fulfilment (p=.031) and burnout (p=.047). N.S change in sleep disturbances, affect and mindfulness. <i>Between baseline and 2-month follow-up:</i> Significant improvement in 1 dimension of burnout (p=.038), resilience (p=.024), and mindfulness (p=.012). N.S change in professional fulfilment, overall burnout, perceived stress, anxiety, depression, sleep disturbances and affect.

D.1.4 Microbreak interventions in surgery

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Dorion (2013) Canada Published report	Randomised crossover trial (N=16)	N=16 surgical staff and residents; M/F ratio not reported	Control vs 20-second micropauses every 20 mins during prolonged (2 hr minimum) surgery	<i>Rated after control and intervention surgery:</i> 1) Study-specific rating of physical discomfort; 2) Fatigue (2.5kg weight hold for as long as possible) 3) Star-shaped precision test	1) Micropauses improved discomfort in neck, back, shoulders, wrists, elbows and eyes compared with control (p<.05). N.S difference in legs/lower limbs. 2) Micropauses improved muscular fatigue cf. control (p<.001). 3) Micropauses improved accuracy cf. control (p<0.01).
Engelmann (2011) Germany Published report	Randomised crossover trial	N=7 paediatric surgeons; n=51 operations randomised to intervention (n=26) or control (n=25); 85.7% Male	5-min intraoperative breaks every 30 mins (25-min work then 5-min break) vs control (no breaks)	<i>Measured before, during and/or after surgery:</i> 1) Salivary cortisol, amylase, testosterone, and DHEA; 2) BP-test of concentration and performance; 3) Fatigue items from NASA Task Load Index; 4)	Compared with control group, break group showed: 1) Salivary cortisol improvement (p<.05), lower testosterone for female participant (p<.001), N.S difference in amylase and DHEA. 2) Improvement in attention (p<.05) and concentration (p=.06) – error rate 3x lower than control, threshold significance due to outlier.

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
				Perceived stress; 5) Pain (neck, arms, spine, knees, eyes); 6) Mean operation time corrected for complexity <i>Measured continuously:</i> 7) Heart rate and intraoperative ECG events (sudden increase in HR during stressful event)	3) Less post-operative fatigue (p<.005), less intra-operative impairment by fatigue (p<.001) 4) Less intra-operative stress (p<.05) 5) Less musculoskeletal strain (all p<.001 except eyes, p=.09) 6) No difference in mean operation time (breaks did not prolong operations, p>.05) 7) Fewer intraoperative events (p<.05), less increase in heart rate (p<.05)
Engelmann (2012)* Germany Published report *Note: Follow-up to Engelmann 2011. Includes patients as participants	Randomised control trial	N=7 paediatric surgeons and N=52 paediatric patients; surgeons; 85.7% Male	Patient outcomes and surgeon perceptions of 5-min intraoperative breaks every 30 mins (25-min work then 5-min break) vs control (no breaks)	<i>Patient outcomes measured during surgeries:</i> 1) Cardiovascular monitoring; 2) Urine volume; 3) Blood gas parameters; 4) Body temperature <i>Surgeon feedback measured 1 month after intervention:</i> 5) Team communication; 6) Team coordination; 7) Were there any welcome breaks vs any particularly unwelcome breaks?; 8) Overall scheme ratings; 9) Individual work style (fast, slow, exact, standardized, creative, alternating)	1-4) No difference between control and intervention groups in any patient outcomes. <i>Surgeon feedback:</i> 5) With breaks team communication changed from implicit (little verbal feedback) to explicit (outspoken) (p<.05) 6) More coordination required for break scheme but not significant (p>.05) 7) Unwelcome breaks scored N.S higher 8) Overall approval rating: 5.9/10 (+/- 3.2) 9) Slow operators more in favour of break scheme than fast operators (p<.05)
Hallbeck (2017) USA Published report	Before-and-after study. 1 control day followed by 1 intervention day. Approx. 1 wk between control and intervention.	N=56 attending surgeons; 67.9% Male	Control surgery day with no breaks vs one day of 1.5-2 min intraoperative microbreaks with guided exercises every 20-40 mins	<i>Measured pre- and post-surgery (control and intervention days):</i> 1) Surg-TLX and GOAL questionnaire; 2) Musculoskeletal pain (Adapted Nordic Musculoskeletal Questionnaire)	1) N.S difference in surgery duration, degree of difficulty, complexity, distractions, and mental and physical demands between intervention and control surgeries 2) Improvement in right and left shoulder pain (p<.001) with microbreaks compared with control 3) Improved by breaks: 62%; No change: 46% 4) Improved by breaks: 34%; No change: 53%; Reduced: 12%

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
				<i>Measured after intervention:</i> 3) Physical performance; 4) Mental focus; 5) Distractions and workflow interruptions caused by breaks; 6) Desire to incorporate into routine	5) Distractions: 2/10, Workflow interruptions: 2/10 6) 87% answered yes

D.1.5 Other microbreak interventions

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Lemaire (2010) Canada Published report	Before-and-after study. 2-day protocol	N=20 medical, surgical, and primary care staff physicians; n=17 day shifts, n=3 night shifts; 85% Male	Standard/usual practice day vs one day of micro-food-breaks (delivery of 6 small daily meals) Baseline day preceded intervention day, both days occurred within 2 wk period	<i>Measured at baseline (7:30am) and 2-hourly intervals until end of day:</i> 1) Simple reaction time and complex reaction time (Brain Checkers software); 2) Capillary blood glucose samples (Precision Xtra Blood Glucose); 3) Volume of fluid consumed and urine voided; 4) Diet recall/food diaries; 5) Checklist of 17 hypoglycemic nutrition-related symptoms	1) Intervention improved speed and accuracy on simple reaction time test (p=0.01) and complex reaction time test (p<.001) 2) Blood glucose levels reduced on intervention day (p=0.03) and less variable 3) Fluid intake (p=.04) and urine output (p=.008) improved by intervention 4) Intervention increased caloric intake (p=.008) 5) N.S reduction in hypoglycemic nutrition-related symptoms on intervention day (p=0.36). 70% ppts reported fewer symptoms or no change compared with baseline
Mengin (2021) France Published report	Randomised control trial	N=47 ENT residents; 47.7% Male	Effect of listening to a 5-min guided mindfulness meditation vs control track prior to a simulated	<i>Measured post-simulation only</i> 1) Performance (rated by blinded expert assessors on bad-news consultation scale); 2) Physician self-rated empathy (visual analogue scale); 3) Patient	1) Performance improved in mindfulness group compared with control group (p=.026). Fewer participants rated as “fail” by assessors in the mindfulness group than control (4.3% vs 30.4%, p=.04) 2) N.S difference in self-rated empathy

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
			consultation where physicians break bad news to patients	perception of physician empathy (Jefferson Scale of Patient Perceptions of Physician Empathy) <i>Measured pre-intervention, post-intervention and post-simulation</i> 4) Self-rated stress (visual analogue scale); 5) Physician self-rated confidence (visual analogue scale)	3) N.S difference in patients' perceived empathy across groups. Perceived empathy positively correlated with performance (r=0.541, p<.001). 4) N.S difference in perceived stress 5) N.S difference in physician confidence

D.1.6 Survey and cohort studies

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Al Dandan (2020) Saudi Arabia Published report	Cross-sectional survey	N=198 clinical radiology residents, senior registrars and consultants; 56.1% Male	Break-taking prevalence as a predictor of digital eye strain	1) Symptoms of digital eye strain 2) Break frequency (% of participants) 3) Break duration (% of participants)	1) Infrequent break-taking (once or twice per day) was a predictor of digital eye strain compared with more frequent break-taking 2) 25.3% once/day, 30.8% twice/day, 32.3% every 2 hours, 11.6% at least hourly 3) 10.6% <5 mins, 45.0% 5-10 mins, 28.3% 11-15 mins, 16.1% >15 mins
Berastegui (2020) Belgium Published report	Observational prospective longitudinal study conducted over 10-month period	N=28 ED physicians; 60.7% Male	Association between fatigue reduction strategies with a) reaction time, and b) burnout. Fatigue reduction strategies: Used to reduce subjective	<i>Measured at baseline only:</i> 1) Checklist of fatigue reduction strategies (FRS, checklist based on previous focus group data) 2) Maslach Burnout Inventory measured at baseline only	1) Higher FRS use significantly associated with faster reaction times on PVT (p=0.01) 2) FRS use not significantly associated with burnout

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
			on-the-job fatigue e.g. rest, nap, have a snack, get fresh air, listen to music, etc.	<i>Measured during each shift (6:30-7:30pm for day shift, 9:30-11pm for night shift):</i> 3) Psychomotor Vigilance Task (PVT)	
Hassan (2020) Egypt Published report	Cross-sectional survey	N=278 surgical and medical resident physicians; 46.4% Male	Association between break prevalence and level of work stress	Adapted version of the Hospital Consultants' Job Stress and Satisfaction Questionnaire (work characteristics rated for their contribution to work-related stress). Stress scores categorized as low, moderate and high.	High stress scores associated with lack of breaks during working hours (76.9% of low/moderate stress group not taking breaks vs 93.3% of high stress group not taking breaks, p=.001) Barriers to break taking: 50.7% of participants described rest areas as limited, 38.8% as sufficient for one person only, 1.8% as big enough, 8.7% reported no rest areas
Hockey (2020) England, UK Published report	Observational prospective longitudinal study	N=565 doctors in training (core, foundation, & specialty trainees); 42% Male	Association between breaks and positive and negative affect	<i>Tasks and affect measured during 2-hour windows. Repeated 5 times in different shifts.</i> Intensity of positive affect (competence, enjoyment, friendliness, happiness) and negative affect (worry, tiredness, impatience, hassle, frustration, criticism) when reporting a break	Compared to shifts with breaks, in shifts without breaks participants experienced significantly greater feelings of negative affect and significantly less feelings of positive affect on all measured domains.
Kalboussi (2020) Tunisia Published report	Cross-sectional survey	N=46 anaesthetists of varying grades; 11% Male	Association between taking breaks at work (among other occupational factors) and burnout	1) Maslach Burnout Inventory 2) Breaks at work dichotomised into "Yes" or "No"	N.S association between burnout and break-taking (p=0.790)
Kirkcaldy (2002) Germany Published report	Cross-sectional survey	N=309 doctors and consultants who own a medical practice;	Association between break duration and occupational stress, motor vehicle	1) Study-specific questionnaire about occupational stress 2) Number of motor vehicle accidents	1a) Occupational stress showed a significant negative association with lunch break duration (r=-0.19, p<.05)

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
		63.4% Male	accident rates, and work-related accident rates	3) work-related accidents during previous 12 months 4) Break duration: Lunch break start and end time reported	1b) In predictor model of job stress break duration was significant ($\beta=-0.16$, $p=.03$) alongside 3 factors: weekly working hours, no. of dependent children and work satisfaction (R^2 adj = 0.12, $p<.001$) 2) Break duration not significant predictor of motor vehicle accident rates 3) In predictor model of work-related accidents, shorter lunch breaks were included ($\beta=+.0.10$, $p<.10$) alongside 1 factor: high levels of job commitment 4) Working longer hours significantly associated with shorter lunch breaks ($p<.001$)
Neprash (2018) USA Conference presentation* *Report published did not include break data.	Retrospective cohort study (Secondary analysis of electronic records spanning 2013-2014 period)	N=2,805 primary care physicians (n=703,612 appointments); M/F ratio not reported	Opioid, NSAID and physical therapy prescribing rates immediately before and after breaks of >15 mins (during appointments where opioids were likely inappropriate)	1) Opioid, NSAID and physical therapy prescribing rates for outpatient appointments (per electronic health record systems) 2) Breaks: Gap of >15 mins in schedule	Physicians 4.9% more likely to inappropriately prescribe opioids before breaks than after ($p=0.02$) N.S. relationship with physical therapy orders and NSAID prescribing
Nitzsche (2017) Germany Published report	Cross-sectional survey	N=152 private practice haematology and oncology physicians; 73% Male	Association between breaks, emotional exhaustion and work-home conflict	1) Maslach Burnout Inventory (emotional exhaustion scale) 2) Work home conflict: Effect of work on private life (Survey Work-Home Interaction – NijmeGen) 3) Home-work conflict: Effect of private life on work 4) Two study specific questions about how often breaks are taken	1) Significant indirect effect of breaks on emotional exhaustion, mediated by work-home conflict ($p<.05$, $\beta = -0.22$). No direct effect. 2) Breaks directly related to work-home conflict. WHC reduced by breaks ($\beta=-.33$, $p<.05$). 3) No direct effect of breaks on home-work conflict. 4) 1/4 took regular breaks, 16% never took breaks.

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Ohlander (2015) Sweden & Germany Published report	Cross-sectional survey Data from the 2 nd of 3 follow-up surveys in cohort study.	Swedish sample: N=85 physicians; 60% M. German sample: N=561 physicians; 48.5% Male	Association between break duration and work stress in two different countries	1) Work stress (Effort-Reward Imbalance questionnaire) 2) Minutes of break per day	1a) Sweden: Negative association between work stress and break duration ($\beta=-0.002$, $p=.03$) 1b) Germany: N.S. association, break duration not included in regression model 2) German sample had shorter breaks per day than Swedish sample (28.2 +/- 18.1 min/day vs 40.4 +/- 20.9 min/day)
Vosshenrich (2021) Switzerland Published report	Retrospective cohort study (secondary data analysis of resident reports)	N=117,402 reports written by n=27 residents; M/F ratio not reported	Effect of lunch breaks on number of corrections made to resident reports in proofreading process	Similarity (%) of preliminary reports to final corrected versions (Jaccard similarity coefficient)	Report similarity temporarily increased after breaks (lunchtime), suggesting recovery. However, recovery effect reduced as the week progressed and disappeared towards end of the week.
Winston (2008) England, UK Published report	Cross-sectional survey	N=328 hospital doctors of varying grades; M/F ratio not reported	Break prevalence and healthy eating behaviours	1) Study-specific checklist of potential barriers to healthy eating 2) Break prevalence	1) Lack of breaks rated the most common barrier to healthy eating (66%). Next most common barriers: Lack of food choices (56%) and canteen opening times (48%). 2) Prevalence of regular break taking: 46%

D.2 Qualitative studies

D.2.1 Qualitative appraisals of interventions

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Lemaire (2011)* Canada Published report	Before-and-after study evaluation using semi-structured interviews	N=20 medical, surgical, and primary care physicians; 85% Male	Standard/usual practice day vs one day of micro-food-breaks (delivery of 6 small daily meals)	Semi-structured interviews before and after intervention (15-45 min duration). Inductive thematic analysis (2 coders).	<u>Impact of inadequate nutrition:</u> 1) Emotional symptoms (e.g. irritability); 2) Physical symptoms (e.g. inability to focus or concentrate); 3) Affects ability to work (efficiency, focus); 4) Affects interactions with others (colleagues and patients).

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
*Note: qualitative follow-up to Lemaire 2010 quantitative intervention study ³¹			Baseline day preceded intervention day, both days occurred within a 2-week period		<u>Barriers to adequate nutrition:</u> 1) Lack of time due to workload and schedule; 2) Lack of access to nutrition (distance of facilities, queues, opening hours); 3) Lack of food choices; 4) Work ethic (work/patients come first); 5) Professionalism (unprofessional to eat in patient areas). <u>Impact of participating in the intervention:</u> 1) Increased awareness of workplace nutrition and impact; 2) Intention to change future habits and eat more regularly.
Lockhart (2013) Canada Conference abstract	One-group post-test only design using qualitative survey evaluation	N=5 rheumatology fellows; M/F ratio not reported	1-hour circuit-training-style exercise session for 12-week period instead of lecture as part of academic half-day	Qualitative survey administered in week 9 of 12. Responses analysed for themes.	1) Program resulted in changes to diet, stress, sleep habits, mood, learning and time-off activities; 2) Participants perceived program as effective use of time and resources, preferable over teachings; 3) 4/5 participants desired focused instruction on beneficial exercises for patients; 4) 3/5 confidence in exercise prescribing increased; 5) 5/5 participants perceived work and training as barrier to exercise; 6) 3/5 had not previously participated in regular exercise. 2/5 participated twice wkly. Post-intervention 4/5 complete 1-3 sessions of exercise >30 mins.

D.2.2 Other qualitative studies

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Hall (2018) England, UK Published report	Single occasion focus groups	N=25 General practitioners (locums, salaried, trainees, and partners); n=5 focus groups;	Breaks as potential strategy to improve general practitioner wellbeing	Inductive thematic analysis (2 coders)	<u>Breaks:</u> 1) Scheduled short breaks as feasible strategy to improve wellbeing. Lunch breaks not deemed realistic but short coffee breaks feasible; 2) Breaks as opportunity to leave the work space, interact with colleagues, and/or have respite from work; 3) Breaks valued where they are common practice and desired where they

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First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
		44% Male			are not; 4) Increase in resources perceived as fundamental to enabling time for breaks
Morrow (2014) UK (England, Scotland Wales, Northern Ireland) Published report	Focus groups and telephone interviews	N=82 medical, surgical and psychiatry foundation and specialty trainees; 44% Male	Effect of UK Working Time Regulations (WTR) on trainees' experience of fatigue (including effect on breaks and rest periods)	n=11 focus groups (60-90 mins) and n=30 telephone interviews (30-45 mins) for participants who could not attend focus groups Analysed using a framework approach (2 coders)	<u>WTR implementation in practice:</u> 1) Fatigue still experienced despite regulations (e.g. due to work compression and intensity); 2) Rest facilities being reduced and less capacity to take breaks or rest; 3) Lost rest periods due to senior staff lack of awareness of them. <u>Effects of fatigue:</u> 1) Detriment to skills, judgement, efficiency, mood, ability to retain new information; 2) Effects compounded by hunger/discomfort from inability to take breaks
O'Shea (2020) USA Published report	Focus groups	N=116 resident and attending physicians in emergency department; M/F ratio not reported	Beliefs about taking breaks for self-care while on shift	n=8 one-hour focus groups conducted separately with residents and attending physicians. Analysed for themes by 3 coders and validated by participants.	<u>Six themes:</u> 1) Emergency physicians have innate physiological needs which affect cognitive function and emotional regulation; 2) Shared beliefs (culture) on break-taking relate to productivity and patient safety as a strength, and self-care as a weakness; 3) Breaks can create delays and negatively impact patient safety, though no participants had experienced this personally; 4) The ability to take breaks requires certain skills, safety-oriented communication strategies, and practice; 5) Changing the cultural norms would require approval from peers and other staff; 6) Breaks need to be flexible in form and duration and cater to individual needs and circumstances.
Walsh (2005) Canada Published report	Semi-structured individual interviews	N=21 female family medicine residents; 0% Male	Effect of access to breaks on ability to breastfeed when returning to work from maternity leave	Semi-structured individual interviews analysed for themes	1) Breastfeeding valued but often unable to continue at work. 2) Maintaining breastfeeding contingent on ability to take breaks to express breast milk. Additional requirements: privacy, good breast pump, refrigerated storage and sympathetic seniors.

D.3 Mixed-method study

First author (year), Country, Type of publication	Design	Population & Male/Female ratio	Break type and/or topic of investigation	Break-related outcome measurement(s)	Break-related result(s)
Wilkesmann (2016) Germany Published report	Sequential mixed method design	N=43 qualitative semi-structured interviews with hospital physicians; N=2,598 quantitative surveys from surgeons and anaesthetists (residents excluded); M/F ratio not reported	Impact of breaks on opportunities for physicians to 'share ignorance' (detect unknown things and share them, ability to learn from failures) or 'hide ignorance' (intentionally prevent knowledge sharing) Ignorance: a known or unknown lack of knowledge	1) Qualitative semi-structured interviews analysed using content analysis firstly deductively then inductively to form hypotheses for subsequent testing in the quantitative survey 2) Quantitative survey item: Effect of breaks ("I usually take opportunities to discuss work related things in my work break with colleagues") on a) hiding ignorance and b) sharing ignorance	1) <u>Qualitative findings:</u> Breaks could serve as informal, face-to-face opportunity to share ignorance and learn from it 2) <u>Quantitative findings:</u> a) Breaks had N.S. effect on hiding ignorance ($p=0.64$) b) Breaks had a significant effect on sharing ignorance ($p<.001$)

Legend and Abbreviations: 'Trainees' – includes any/all training grades, unless specifically stated. Consultants – fully trained in specialty, includes 'faculty' and 'attending' physicians/ surgeons. EM – Emergency medicine specialty. ED – Emergency department. ENT- Ear, nose and throat. Hr(s) – hour(s). M/F – male/female. Min(s) – Minute(s). OBGYN – Obstetrics and gynaecology. NSAIDS – non-steroidal anti-inflammatory medication. WTR – working time regulations. UK- United Kingdom. USA – United States of America. Wk(s) – Week(s)

Appendix E Phase 1 Survey participant information sheet

Study Title: Exploring the Wellbeing of Doctors: Survey

Researcher: Dr Gemma Simons and Aimee O’Neill

IRAS number: 266831

ERGO number: 49247; Version 0.4

You are being invited to take part in the above study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This research is part of a portfolio of work from the Centre for Workforce Wellbeing, a collaboration between Health Education England and the University of Southampton. The research also forms part of two PhD research projects. The importance of doctors’ wellbeing to us as individuals and to everyone using our national health and social care system is evidenced by 80% of doctors being at high risk of burnout and 11,576 doctor vacancies. Policy documents recommend interventions at a system, group and individual level to try improve wellbeing. Many trusts are keen to “do something” and are spending money on interventions to improve on the 6% of staff that said their trust takes positive action on health and wellbeing in the 2018 NHS Staff survey. This study aims to explore doctors’ opinions on the interventions that could improve their wellbeing as well as the outcome measures that could be used to evaluate them.

Why have I been asked to participate?

Because you are a doctor attending a local trust.

What will happen to me if I take part?

After you have read this information sheet you will be asked to initial and sign a consent form, so that we know you understand the study and want to participate.

You are being asked to take part in an anonymous questionnaire. This involves considering and answering questions for 30 minutes on how you think wellbeing should be measured and improved

in doctors. You will be asked either to use an app on your smartphone, a provided tablet, or a paper form if the survey is conducted face to face. You will be emailed a link to an online survey if it is not face to face. All of these methods will allow you to provide anonymous answers to the questions. You will be asked not to talk to other doctors about the survey while completing the survey. You can also choose whether to be invited to further surveys or a follow-up face-to-face interview with a researcher. This will only happen if you initial that part of the consent form. Your participation in further surveys and the interview is optional and is not a prerequisite to participating in this survey.

Are there any benefits in my taking part?

There are no direct benefits to taking part in this survey. The study aims to improve our understanding of doctors' experiences and priorities for interventions that could improve their wellbeing and the measures that could be used to evaluate them. This could result in the design and implementation of user-endorsed, well-evidenced wellbeing interventions, which ensures that the suite of interventions offered by the National Health Service are helpful to you and your colleagues.

Are there any risks involved?

There are no anticipated risks associated with the answering the survey questions.

What data will be collected?

Your consent form and a decryption file will be the only place that your personal information (your name) is listed. You will be asked your role, and some personal information about your gender, ethnicity and religion before answering the wellbeing questions. The number of people that answered each question and the percentage that gave each answer will be recorded, along with free text answers. Your name will not be linked to any of your answers.

Will my participation be confidential?

Yes. Your participation and the information we collect about you during the course of the research will be kept strictly confidential. All consent forms and the decryption file will be stored securely in a locked filing cabinet, in a limited access room in the limited access Academic Centre, College Keep, University of Southampton. The Investigators involved with this study will not disclose, or use for any purpose other than performance of the study, any confidential information disclosed to those individuals for the purpose of the study. All electronic data will be anonymised and stored on the secure University of Southampton network and require password input for access. Members of the University of Southampton may be given access to data for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may

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require access to data. All of these people have a duty to keep information, as a research participant, strictly confidential.

Do I have to take part?

No. It is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to sign a consent form to show you have agreed to take part.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time without giving a reason and without your participant rights being affected. However, if you decide to withdraw from the study it will not be possible to remove the data that is no longer linked to your personal information.

What will happen to the results of the research?

Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

Where can I get more information?

Dr Gemma Simons (Clinical Research Fellow) & Aimee O'Neill (Senior Research Assistant)

c4ww@soton.ac.uk

02382 310776

Centre for Workforce Wellbeing, Academic Centre, College Keep, 4-12 Terminus Road, Southampton, Hampshire, SO14 3DT.

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Thank you for taking the time to read the information sheet and for considering taking part in the research.

Appendix F Phase 1 Survey consent form

Study title: Exploring the Wellbeing of Doctors: Survey

Researchers name: Dr Gemma Simons & Mrs Aimee O'Neill

IRAS: 266831

ERGO number: 49247; Version 0.4

Participant Identification Number (will be completed by the researcher):

Please initial the box(es) if you agree with the statement(s):

- I have read and understood the information sheet (06/08/19 V0.4) and have had the opportunity to ask questions about the study.
- I agree to take part in this research project and agree for my data to be used for the purpose of this study.
- I understand my participation is voluntary and I may withdraw at any time for any reason without my participation rights being affected.
- I understand that if I withdraw from the study after any questions have been asked, it will not be possible to remove the data once it is no longer linked to my personal information.
- I agree to be sent the link to take part in the survey.
- I agree to be contacted about taking part in further surveys and interviews that are part of the Exploring the Wellbeing of Doctors research (optional)

Name of participant (print name).....

Signature of participant.....

Date.....

Name of researcher (print name).....

Signature of researcher.....

Date.....

Appendix G Phase 1 Survey case report form

Study Title: Exploring wellbeing in doctors: A Survey.

Researchers: Dr Gemma Simons and Mrs Aimee O'Neill

IRAS number: 266831

ERGO number: 49247; Version 0.2

Participant Number:

Case Report Form

1. Are you a doctor?

Yes

No

2. What is your **email address**? (optional)

Thank you for your time in completing this form.

Appendix H Demographic data questionnaire

Study Title: Exploring Wellbeing in doctors: Survey

Researcher: Dr Gemma Simons and Mrs A. O'Neill

IRAS number: 266831

ERGO number: 49247

Demographic Questions

1. How would you define your role?

- Foundation trainee
- Core trainee
- Speciality trainee
- Registrar
- Speciality, associate specialist
- Consultant
- Other (please specify):

2. What speciality are you working in?

.....

3. How old are you (years)?

4. What is your gender?

- Male
- Female
- Prefer not to say
- Prefer to self-describe:

5. What is your ethnicity? Choose the option that best describes your ethnic group or background.

White

- English/Welsh/Scottish/Northern Irish/British
- Irish
- Gypsy or Irish Traveller
- Any other White background, please describe:

Mixed/Multiple ethnic groups

- White and Black Caribbean
- White and Black African
- White and Asian
- Any other Mixed/Multiple ethnic background, please describe:

Asian/Asian British

- Indian
- Pakistani
- Bangladeshi
- Chinese
- Any other Asian background, please describe:

Black/ African/Caribbean/Black British

- Black British
- African
- Caribbean
- Any other Black/African/Caribbean background, please describe:

Other ethnic group

- Arab
- Prefer not to say
- Any other ethnic group, please describe:

6. What is your religion?

- No religion
- Christian (including Church of England, Catholic, Protestant and all other Christian denominations)
- Buddhist
- Hindu
- Jewish
- Muslim
- Sikh
- Prefer not to say
- Any other religion, please describe:

Appendix I Break-taking survey questions

Study Title: Exploring Wellbeing in doctors: Survey

Researcher: Dr Gemma Simons and Mrs A. O'Neill

IRAS number: 266831

ERGO number: 49247

Survey Questions

Exploring break behaviours

1. Have the following ever been a factor in you missing your breaks? (Tick any that apply and put a star next to those you think are most important)

Factor	Tick or star
Workload	
Staffing levels	
Expectation from others to keep working	
Pressure on self to keep working	
Lack of break facilities/infrastructure	
Interruption during breaks (e.g. bleeps, colleagues)	
Breaks are not restful (e.g. rumination on to-do list during breaks)	
Other (please describe):	

2. Please read the statements below and rate whether you would be more likely or less likely to take a break given each scenario:

Statement	More likely	Less likely	No difference
Have some tasks completed by other types of staff (e.g. doctors administrators)			
Having someone who is able to cover my tasks			
Improve rest facilities/infrastructure (e.g. improve locations/quality of doctors' mess)			

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Statement	More likely	Less likely	No difference
Team building (e.g. to foster trust in other members of team so I feel confident my work will be completely covered in my absence)			
Encouragement from seniors to take breaks			
Make break-taking mandatory			
Offer break activities/distractor/interrupting activity (e.g. therapy dog visit, 5-minutes of mindfulness, sensory pods)			
Understanding how self-care impacts patient outcomes			
Campaigns/posters/visible reminders across hospital about the importance of taking breaks in the workplace			
Handing over bleep when going on break			
Other (please describe):			

3. How often do you miss your breaks/rest periods? (How often are you unable to take your breaks?)

Option	Tick
Daily	
Every second day	
Twice a week	
Weekly	
Fortnightly	
Monthly	
Never	

4. Do you think taking breaks during shifts is important to your wellbeing?

Option	Tick
Yes	
No	
Undecided	

Appendix J Public survey questions (written)

Doctors and Breaks

The following questions do not refer to attendance at A&E (except question 8):

1. Do you think it is important for doctors to take rest breaks during their shifts? Please explain why/why not.

2. How many hours do you think a doctor works on average per week?

3. If a doctor works a 10-hour shift, do you think the doctor should take a break? If so, for how long?

4. How would you feel if you saw a doctor taking a break? (e.g. having lunch, going to a coffee shop, etc.)

5. Would you be prepared to wait for treatment/an appointment whilst a doctor took a break? If yes, how long would you be willing to wait?

6. Would your answer to question 5 be different if you were seeking treatment for your child(ren), or if your child(ren) was present whilst you waited? How would you feel if you saw a doctor take a break in this scenario?

7. Would your answer to question 5 be different if you needed to be somewhere soon after your appointment (e.g. work, school run, etc.)? How would you feel if you saw a doctor take a break in this scenario?

8. Would your answers to questions 5-7 be different if you were attending A&E instead? If so, why?

Appendix K Phase 1 interview participant information sheet

Study Title: Exploring the Wellbeing of Doctors: Individual Interviews

Researchers: Dr Gemma Simons and Aimee O’Neill

IRAS number: 266831

ERGO number: 49247; Version 0.3

You are being invited to take part in the above study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This research is part of a portfolio of work from the Centre for Workforce Wellbeing, a collaboration between Health Education England and the University of Southampton. The research also forms part of two PhD research projects. The importance of doctors’ wellbeing to us as individuals and to everyone using our national health and social care system is evidenced by 80% of doctors being at high risk of burnout and 11,576 doctor vacancies. Policy documents recommend interventions at a system, group and individual level to try improve wellbeing. Many trusts are keen to “do something” and are spending money on interventions to improve on the 6% of staff that said their trust takes positive action on health and wellbeing in the 2018 NHS Staff survey. This study aims to explore doctors’ opinions on the interventions that could improve their wellbeing as well as the outcome measures that could be used to evaluate them.

Why have I been asked to participate?

Because you are a doctor attending a local trust.

What will happen to me if I take part?

You will meet with a researcher who will ask you questions relating to your workplace experiences and what could be done to measure and improve doctors’ wellbeing. These interviews will vary in length but will take approximately 30 minutes. Interviews will be held at a date, time and location that fits with your shift patterns and the interviews could be held over two separate occasions if this is more convenient.

Are there any benefits in my taking part?

For your participation you will be provided with a £10 voucher. The study aims to improve our understanding of doctors' experiences and priorities for interventions that could improve their wellbeing and the outcome measures that could be used to evaluate them. This could result in the design and implementation of user-endorsed, well-evidenced wellbeing interventions, which ensures that the suite of interventions offered by the National Health Service are helpful to you and your colleagues.

Are there any risks involved?

Depending on your personal experiences and level of disclosure, the questions during the face-to-face interviews could bring to mind unpleasant memories. Should you experience any psychological distress, we will discontinue the interview process and signpost you to appropriate support services.

Your GP, for health concerns.

The BMA wellbeing support service 0330 123 1245 (24 hour phone line) for any other concerns.

What data will be collected?

Your consent form and a decryption file will be the only place that your personal information (your name) is listed. The face-to-face interviews will be audio recorded. Audio recordings will be labelled with a number code and will be given to a typist who will type out what was said to produce a transcript. The typist will have signed an agreement to keep everything said in the interview strictly confidential. Any personal identifiers, such as your name, the names of associates, or your role/team, will be removed from transcripts. Your transcript will only be identified through the number code. The recordings will be password protected, and only accessible by the research team and transcriber. Audio recordings will be deleted once transcribed and checked for quality.

Will my participation be confidential?

Yes. Your participation and the information we collect about you during the course of the research will be kept strictly confidential. All consent forms, audio recordings, transcripts and the decryption file will be stored securely in a locked filing cabinet, in a limited access room in the limited access Academic Centre, College Keep, University of Southampton. The Investigators involved with this study will not disclose, or use for any purpose other than performance of the study, any confidential information disclosed to those individuals for the purpose of the study. All electronic data will be anonymised and stored on the secure University of Southampton network and require password input for access. Members of the University of Southampton may be given access to data for monitoring purposes and/or to carry out an audit of the study to ensure that the research is

complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to data. All of these people have a duty to keep information, as a research participant, strictly confidential.

Do I have to take part?

No. It is entirely up to you to decide whether or not to take part in both or either part of this research study. If you decide to take part, you will need to sign a consent form to show you have agreed to take part.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time without giving a reason and without your participant rights being affected. The interviews can be stopped at any time. If you decide to withdraw, the audio recordings and transcripts with your contributions will be removed.

What will happen to the results of the research?

Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

Where can I get more information?

Dr Gemma Simons (Clinical Research Fellow) and Mrs Aimee O'Neill (Senior Research Assistant)

c4ww@soton.ac.uk

02382 310776

Centre for Workforce Wellbeing, Academic Centre, College Keep, 4-12 Terminus Road, Southampton, Hampshire, SO14 3DT.

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Thank you for taking the time to read the information sheet and considering taking part in the research.

Appendix L Phase 1 interview consent form

Study title: Exploring the Wellbeing of Doctor: Individual Interviews

Researcher names: Dr Gemma Simons and Aimee O'Neill

IRAS number: 266831

ERGO number: 49247; Version 0.3

Participant Identification Number (to be completed by the researcher):

Please initial the box(es) if you agree with the statement(s):

- I have read and understood the information sheet (06/08/19 V0.3) and have had the opportunity to ask questions about the study.
- I agree to take part in this research project and agree for my data to be used for the purpose of this study.
- I understand my participation is voluntary and I may withdraw at any time for any reason without my participation rights being affected.
- I understand that the information I provide for this study will be treated confidentially, and my name will not be identified or identifiable in the report or reports that result from the research.
- I agree to being audio recorded for the interview. I understand the audio recording will be used only for analysis and that anonymous, non-identifiable extracts from the interview may be used in reports, journal articles or conference presentations developed as a result of this research. I understand that no other use will be made of the recording without my written permission and that no one outside the research team and transcriber will be allowed access to the original recording.

Name of participant (print name).....

Signature of participant.....

Date.....

Name of researcher (print name).....

Signature of researcher

Date.....

Appendix M Phase 1 interview topic guide

ERGO number: 49247; Version 0.3

The list below is not exhaustive and not every question will need to be asked. The researcher will be guided by what the participant wants to discuss relating to the broad topics, and some questions will be informed by the questionnaire/survey results.

For the purpose of this interview when I say “breaks” I am referring to breaks during the context of a shift, not a career break or the period of time between two shifts.

1. How often do you take breaks?
2. How long are your breaks typically?
3. When do you usually take your breaks? (i.e. at what point in your shift)
4. What do you typically do during your break?
5. Do you find you are able to relax and engage in, or think about, non-work activities during your breaks? (If no: Why do you think that is? What could help you to fully relax in your breaks?)
6. Do you experience any difficulties taking your breaks?
7. In our survey most participants reported missing their breaks on a daily or weekly basis. Under the 2016 Junior doctor contract the Guardian of Safe Working can levy fines to Trusts if breaks are missed on at least 25% of shifts, how do you feel about this? (Prompts: Have you witnessed or been a part of instances where this has happened?)
8. What do you think could help you to take your breaks more often? (Further prompts: 1) In a perfect scenario with unlimited resources? 2) Is there something feasible that Trusts could do for you/offer at present to help you take your breaks, given current infrastructure/resources?)
9. *[If not already addressed above]* When asked in our survey, one of the most frequent hindrances to taking breaks appeared to be interruptions during breaks. Have you experienced this? (Further prompts: Who do the interruptions come from? Do you think there is a way to minimize this?)

Appendix M

10. *[If not already addressed above]* When asked in our survey, respondents said that having encouragement from seniors would be important to their ability to take breaks. How do you feel about this? (Further prompts: Who does the pressure come from to skip breaks? Is it other juniors, seniors, upper seniors?)

11. *[If not already addressed above]* When asked in our survey, respondents said that having someone who is able to cover their tasks or having some tasks completed by other types of staff (e.g. doctors administrators) would be important to their ability to take breaks, how do you feel about this?

12. If you were offered distractor break activities would this help you to take your breaks? This could include opportunities for mindfulness/meditation, or exercise. What about activities such as a visiting therapy dog who comes to the ward?

Appendix N Phase 2 survey participant information sheet

Study Title: Called to Serve: The experience of final-year medical students during COVID-19 and beyond

Researchers: Mrs Aimee O'Neill, Prof Julia Sinclair

ERGO number: 56024; Version 1.3

To help you decide whether you would like to take part in this study, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. If you are happy to participate you will be asked to tick a box to indicate your consent.

What is the research about?

The coronavirus outbreak has had a significant impact on the delivery of patient care and medical education including extraordinary measures being undertaken to enable NHS frontline staff to meet clinical demand. The implications of this on the medical workforce and future medical education is unknown. This study will assess the effect of these circumstances on the health and wellbeing of medical students and their early workplace experiences.

This research is part of a portfolio of work from the Centre for Workforce Wellbeing, a collaboration between Health Education England and the University of Southampton. The research also forms part of a PhD research project. It is supported by the Faculty of Medicine, Prof Diana Eccles and Dr Jane Wilkinson.

Why have I been asked to participate?

Because you were a final-year medical student at the University of Southampton in April 2020.

What will happen to me if I take part?

After you have read this information sheet you will be asked to click a consent box, so that we know you understand the study and want to participate.

You are being asked to take part in a questionnaire that will be anonymised. This should take less than 15 minutes to complete and will ask about your health and wellbeing and how you make

decisions. [You will also be invited to complete a similar set of questions in approximately 3 months time.] **Text in square brackets removed from final survey.**

Are there any benefits in my taking part?

There are no direct personal benefits in taking part, beyond the involvement in this important and unique research. For each survey you complete, you will receive £5 towards your Amazon voucher. If you complete the baseline survey and both follow-up surveys you will receive a £15 Amazon voucher. The voucher will be provided upon completion of the second follow-up survey in October 2020.

Are there any risks involved?

There are no anticipated risks associated with the answering the survey questions. However, it is possible that completing the questionnaire at follow-up could bring to mind negative experiences of the pandemic.

What data will be collected?

Your consent form and a decryption file will be the only place that your personal information your name is listed. You will be asked some demographic information about your gender, ethnicity and religion before completing the main survey. Summary statistics (e.g. the number of people answering each question) will be recorded, along with free text answers. Your name will not be linked to any of your answers.

For the duration of the study, your anonymised data will be stored on the University of Southampton network and require password input for access. The investigators involved with this study will not use for any purpose other than performance of the study, any information you provide during the course of the study. Identifiable information about you will be kept for up to 15 years after the study has finished after which time any link between you and your information will be removed.

Will my participation be confidential?

Yes. Your participation and the information we collect during the course of the research will be kept strictly confidential. The Investigators involved with this study will not use for any purpose other than performance of the study, any information given by participants during the course of the study. All electronic data will be anonymised and stored on the secure University of Southampton network and require password input for access. Members of the University of Southampton may be given access to data for monitoring purposes and/or to carry out an audit of the study to ensure that the research meets regulatory requirements. These people have a duty to keep information strictly confidential.

Do I have to take part?

No. It is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to tick a box to show you have agreed to take part.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time without giving a reason and without your participant rights being affected. If you withdraw, we will clarify with you whether you wish to have all of your data withdrawn or if you only wish to withdraw from future data collection.

What will happen to the results of the research?

Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent. We will keep you informed with updates via our social media pages.

Where can I get more information?

Aimee O’Neill

c4ww@soton.ac.uk

02382 310776

Centre for Workforce Wellbeing, Academic Centre, College Keep, 4-12 Terminus Road, Southampton, Hampshire, SO14 3DT.

What happens if there is a problem?

If you become distressed during the completion of these surveys, a list of resources for potential help will be placed at the end of each questionnaire or you can email us at c4ww@soton.ac.uk if you wish to have a follow-up contact. This email will be monitored daily over the course of the study, will give details of emergency contacts numbers and a clinical member of the research team (or their delegate) will respond to any requests for urgent follow up within 24 hours.

If you have a concern about any aspect of this study, contact Aimee O’Neill (c4ww@soton.ac.uk) or Prof Julia Sinclair (Julia.sinclair@soton.ac.uk) who will do their best to answer your questions. If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Appendix O Phase 2 survey consent form

Study title: Called to Serve: The experience of final-year medical students during COVID-19 and beyond

Researchers name: Mrs Aimee O'Neill, Prof Julia Sinclair

ERGO number: 56024

Please read the following statements and tick the box below to indicate you consent to taking part in this research study:

- I have read and understood the information sheet (V1.3 10/08/20) and have had the opportunity to ask questions about the study.
- I agree to take part in this research project and agree for my data to be used for the purpose of this study.
- I understand my participation is voluntary and I may withdraw at any time for any reason without my participation rights being affected.
- I consent to be followed up at the time points specified in the participant information sheet (V1.3 10/08/20).
- I give permission for my anonymised data to be used and stored, as described in the participant information sheet (V1.3 10/08/20), for future research

Please tick (check) this box to indicate that you agree to the above statements and consent to taking part in this survey

Appendix P Phase 2 interview participant information sheet

Study Title: Called to Serve: The experience of final-year medical students during COVID-19 and beyond

Researcher: Mrs Aimee O'Neill, Prof Julia Sinclair

ERGO number: 56024

You are being invited to take part in the above study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. To provide consent for this interview, we will ask you whether you agree to several statements before the interview starts.

What is the research about?

The coronavirus outbreak has had a significant impact on the delivery of patient care and medical education including extraordinary measures being undertaken to enable NHS frontline staff to meet clinical demand. Having asked you to complete questions that assess the effect of these circumstances on the health and wellbeing of junior doctors and the impact of their early workplace experiences, we also wish to understand better the personal impact on you and how you narrate those experiences.

This research is part of a portfolio of work from the Centre for Workforce Wellbeing, a collaboration between Health Education England and the University of Southampton.

The research also forms part of a PhD research project. It is supported by the Faculty of Medicine, Prof Diana Eccles and Dr Jane Wilkinson.

Why have I been asked to participate?

You kindly agreed to be part of our 2020 final year cohort in April 2020 and have completed our surveys. We are now wanting to follow up how things are with you personally.

What will happen to me if I take part?

You will speak with a researcher over the telephone, who will ask you questions relating to your workplace experiences during and after the coronavirus outbreak. These interviews will vary in

length but will take up to 45 minutes. Interviews will be held at a date and time that fits your schedule and the interview could be held over two separate occasions if this is more convenient.

Are there any benefits in my taking part?

There are no direct personal benefits in taking part, beyond the involvement in a research project and being part of this cohort. However, in research of this kind, people sometimes find it helpful to be able to narrate their experiences. To thank you for your participation you will be offered a £10 Amazon voucher or we can make a £10 donation to your cohort's graduation celebration fund.

Are there any risks involved?

Depending on your personal experiences and level of disclosure, the questions during the interviews could bring to mind unpleasant memories. Should you experience any psychological distress, we will pause or discontinue the interview process, ensure you are ok and signpost you to appropriate support services.

What data will be collected?

Your consent form and a decryption file will be the only place that your personal information your name is listed. The interviews will be audio recorded. Audio recordings will be labelled with a number code and will be converted into a transcript of the interview by a university-approved transcriber. Any personal identifiers, such as your name, the names of friends/family/ associates, or your role/team, will be changed in the final transcripts. Your transcript will only be identified through the number code. The recordings will be password protected, and only accessible by the research team and transcriber. Audio recordings will be deleted once transcribed and checked for quality.

For the duration of the study, your anonymised data will be stored on the University of Southampton network and require password input for access. The investigators involved with this study will not use for any purpose other than performance of the study, any information you provide during the course of the study. Identifiable information about you will be kept for up to 15 years after the study has finished after which time any link between you and your information will be removed.

Will my participation be confidential?

Yes. Your participation and the information we collect during the course of the research will be kept strictly confidential. The Investigators involved with this study will not use for any purpose other than performance of the study, any information given by participants during the course of the study. All electronic data will be anonymised and stored on the secure University of Southampton network and require password input for access. Members of the University of Southampton may be given access

to data for monitoring purposes and/or to carry out an audit of the study to ensure that the research meets regulatory requirements. These people have a duty to keep the information strictly confidential.

Do I have to take part?

No. It is entirely up to you to decide whether or not to take part. If you decide to take part, you will need to sign an online consent form to show you have agreed to take part.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time without giving a reason and without your participant rights being affected. The interviews can be paused or stopped at any time. If you withdraw, we will clarify with you whether you wish to have all of your data withdrawn or if you only wish to withdraw from future data collection.

What will happen to the results of the research?

Research findings made available in any reports or publications will not include information that can directly identify you without your specific consent.

Where can I get more information?

Mrs Aimee O'Neill

c4ww@soton.ac.uk

02382 310776

Centre for Workforce Wellbeing, Academic Centre, College Keep, 4-12 Terminus Road, Southampton, Hampshire, SO14 3DT.

What happens if there is a problem?

If you have a concern about any aspect of this study, you should contact Aimee O'Neill (c4ww@soton.ac.uk) or Prof Julia Sinclair (Julia.sinclair@soton.ac.uk) who will do their best to answer your questions.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Thank you for taking the time to read the information sheet and considering taking part in the research.

Appendix Q Phase 2 interview consent form

Study title: Called to Serve: The experience of final-year medical students during COVID-19 and beyond

Researcher names: Mrs Aimee O'Neill, Prof Julia Sinclair

ERGO number: 56024

Please answer "yes" if you agree to the following statements:

- I have read and understood the information sheet (16/06/2020 V1.2) and have had the opportunity to ask questions about the study.
- I agree to take part in this research project and agree for my data to be used for the purpose of this study.
- I understand my participation is voluntary and I may withdraw at any time for any reason without my participation rights being affected.
- I understand that the information I provide for this study will be treated confidentially, and my name will not be identified or identifiable in the report or reports that result from the research. I understand that I may be quoted directly in reports of the research but that I will not be directly identified (e.g. my name, names of people I mention, and any obviously identifying details will be changed).
- I agree to being audio recorded for the interview. I understand that the recording will be transcribed and then destroyed. I understand that no other use will be made of the recording without my written permission and that no one outside the research team and transcriber will be allowed access to the original recording.

Appendix R Phase 2 interview topic guide

The list below is not exhaustive and not every question will need to be asked. The researcher will be guided by what the participant wants to discuss relating to the broad topics (in bold), and some questions will be informed by the questionnaire/survey results.

For the purpose of this interview when I say “breaks” I am referring to breaks during the context of a shift, not a career break or the period of time between two shifts.

Typical work day

Could you tell me a bit about your average working day or the shift you just completed?

OR: Can you tell me a little about your current job/placement? What is the structure of your team, etc.?

Prompts, if applicable:

- Is that quite typical of your shifts? How was it different?
- What kind of shift pattern are you on? What difference does that make to your workload?
- Did you notice any differences in your previous placement(s)?
- You did/didn't mention breaks...

Breaks

How do breaks typically fit into your work day?

Prompts, if applicable:

- How often do you take breaks?
- How long are your breaks typically? How long do you think breaks should be?
- When do you usually take your breaks? (i.e. at what point in your shift)
- What do you typically do during your break?
- Do you find you are able to relax and engage in, or think about, non-work activities during your breaks? (If no: Why do you think that is? What could help you to fully relax during your breaks?)
- Do you experience any difficulties taking your breaks?
- When you are on other shifts (e.g. nights or on call) how is this different?
- What about the others in your team, are they typically able to take their breaks?

List of References

- When asked in our survey, one of the most frequent hindrances to taking breaks was [1) workload 2) pressure on self]. Have you experienced this? (Further prompts: Do you think there is a way to minimize this?)
- The Guardian of Safe Working can levy fines to Trusts if breaks are missed on at least 25% of shifts, how do you feel about this? (Prompts: Have you witnessed or been a part of instances where this has happened?)
- What do you think could help you to take your breaks more often? (Further prompts: 1) In a perfect scenario with unlimited resources? 2) Is there something feasible that Trusts could do for you/offer at present to help you take your breaks, given current infrastructure/resources?)
- When asked in our survey, respondents said that [1) encouragement by seniors 2) cover] would be important to their ability to take breaks. How do you feel about this?
- If you were offered distractor break activities would this help you to take your breaks? This could include opportunities for mindfulness/meditation, or exercise. What about activities such as a visiting therapy dog who comes to the ward? (Further prompts: Are there any other distractor activities that would encourage you to take your breaks?)

Wellbeing and coping

What else do you do to keep fit and well during/at work? What about outside of work?

Prompts, if applicable:

- What is the most successful (or least successful) thing that helps you to maintain or improve your wellbeing?
- Is there anything that could be/could have been offered or done by your employer/Trust to help your wellbeing?

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