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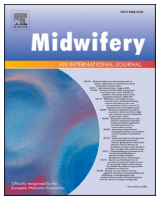

The importance of recovery and staffing on midwives' emotional wellbeing: A UK national survey

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ABSTRACT

Background: There is currently a gap in the evidence on how working practices, such as the ability to take rest breaks, finish on time or intershift recovery influence outcomes.
Aim: The aim of this study was to explore the association of individual characteristics, work-related factors and working practices on emotional wellbeing outcomes of UK midwives.
Methods: An online cross-sectional survey collated data between September and October 2020. Outcomes explored were work-related stress, burnout, being pleased with their standard of care, job satisfaction and thoughts about leaving midwifery. Univariate analysis identified the explanatory variables to be investigated using multivariable logistic regression.
Findings: A total of 2347 midwives from the four UK nations completed the survey. No standard approach in monitoring safe staffing or in-shift or intershift recovery was found. There were high levels of work-related stress, burnout and thoughts about leaving midwifery, and low levels of job satisfaction, with just half of midwives reporting they were satisfied with the standard of care they could provide. Multivariable regression revealed that working practices variables, generally related to impeded recovery or compounded by staffing issues, had a significant association with poorer emotional wellbeing outcomes.
Conclusion: This research has demonstrated an association between impeded recovery, including a lack of formal methods to monitor this, and poorer emotional wellbeing outcomes, and that staffing levels are highly influential in determining outcomes. There is a need to re-evaluate current approaches to job design and how midwives are expected to work.

Introduction

Fisher (2014) suggests that most people rate wellbeing at work as the most important aspect in overall wellbeing so the influence of the workplace cannot be ignored. If it is regarded as unhealthy or unsafe, it can lead to negative outcomes such as work-related stress, job dissatisfaction and burnout (Burton, 2010). There are many definitions of burnout, but a central aspect is that it is an occupational phenomenon resulting in fatigue (exhaustion) as a long-term response to prolonged, unresolved stressors at work (Bianchi et al., 2015). Job demands can lead to exhaustion, but the critical point associated with burnout is the inability to rest and recover (at work or home) (Maslach and Leiter, 2004).

Much of the evidence on the factors contributing to burnout in midwives is from surveys conducted in high income countries, particularly Australia, New Zealand and Europe. There is some evidence to suggest the way in which a midwife works may influence outcomes. Surveys conducted in Australia (Newton et al., 2014; Dawson et al., 2018) and New Zealand (Dixon et al., 2017) have reported lower burnout scores for those working in caseload/continuity models when compared to non-caseload midwives. However, findings were based on a comparison of mean/median scores with no control of variables that could have mediated or contributed to the effect. In Australia, Fenwick et al. (2018a) performed multinomial logistic regression to identify factors associated with burnout. Working in a caseload/continuity model was associated with reduced odds of personal and work-related

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burnout when compared to those working on the postnatal ward. Fenwick et al. (2018b) then excluded non-clinical midwives to compare burnout scores between continuity and non-continuity midwives. Whilst non-continuity midwives had higher burnout scores, the size of the effect was small, suggesting little difference between the groups.

The influence of age, having children, years of experience, weekly hours or day/night/rotational shifts on burnout is conflicting (Sandall, 1998; Hildingsson et al., 2013; Newton et al., 2014; Henriksen and Lukasse, 2016; Dixon et al., 2017; Fenwick et al., 2018a; Hunter et al., 2019; Stoll and Gallagher, 2019; Mohammad et al., 2020), which may be due to differences within samples or methods of analysis. No study considered the effect of other working practices, such as consecutive shifts or the ability to take rest breaks, and only one study in England (Sandall, 1998) controlled for working extra hours, resulting in a gap in the evidence.

Factors influencing job satisfaction have often been assessed through the analysis of open-ended survey questions. Findings of surveys conducted in the United Kingdom (UK) (Sandall, 1998; Cull et al., 2020), Australia (Harvie et al., 2019) and The Netherlands (Warmelink et al., 2015; Cronie et al., 2019) appear to share common themes. The ability to interact and have time to provide advice and high-quality care to women has been linked to job satisfaction (Sandall, 1998; Warmelink et al., 2015; Harvie et al., 2019; Cull et al., 2020), but when this was absent, it has resulted in negative views (Harvie et al., 2019). Good organisation within the workplace was also associated with job satisfaction (Warmelink et al., 2015), with the perceived manageability of work demands or tasks determining whether this was viewed positively or negatively (Sandall, 1998; Cronie et al., 2019; Cull et al., 2019). Understaffing, working long shifts/hours with no breaks, late notice of shift allocation, inflexible rosters, not finishing on time and enforced rotations have been linked to job dissatisfaction (Sandall, 1998; Cull et al., 2019; Harvie et al., 2019), which may explain why recognition and support appeared important (Cull et al., 2019; Warmelink et al., 2015).

Further research that explores the effect of a wider range of working practices, and controls for the effect or interaction of these variables was needed to address the gap in the current evidence. The aim of this survey was to explore and analyse the association between individual characteristics, work-related factors and other working practices and their effect on emotional wellbeing outcomes of midwives working in the National Health Service (NHS) in the UK.

Participants, ethics and methods

Participants

Purposive sampling was employed to recruit participants. To be eligible for inclusion, midwives had to be registered with the UK Nursing and Midwifery Council (NMC), currently working in a clinical role within the NHS, at Band 5, 6 or 7. In the UK, Band 5 are newly registered midwives completing a preceptorship period (enhanced support and development, with supernumerary periods) before progressing to Band 6. Band 7 represents senior midwives, such as shift co-ordinators or specialist midwives. Students, non-clinical midwives and Band 8 midwives were excluded. Band 8 typically represents matrons, consultant midwives or senior management. Recruitment was achieved through advertisements on social media platforms, such as Twitter and Midwifery Groups/Networks on Facebook, and through 44 survey champions who were recruited during the pre-testing phase (Dent et al., 2023). The survey was live for six weeks (1st September to 13th October 2020). To perform the planned analyses, it was estimated that a minimum of 1000 responses would be required (Nemes et al., 2009).

Methods

An online survey was developed to collate the data (see Supplementary file 1). The process of survey development and evaluation are reported elsewhere (Dent et al., 2023). A pilot, involving 10 midwives, who had not taken part in the pretesting phase, was also conducted between March and May 2020. Burnout was measured using the Copenhagen Burnout Inventory (CBI) (Kristensen et al., 2005). In the CBI, fatigue and exhaustion are deemed to be at the core of burnout which are attributed to specific personal, work or client-related domains, thus may indicate where midwives may experience burnout, for example, in their personal or work-lives. Personal burnout focuses on how tired or exhausted a person is (6 items), work-related burnout focuses on a person's own attribution of symptoms to their work (7 items), and client-related burnout focuses on the attribution of fatigue to working with clients (6 items). Item scores are 'Always/To a very high degree' (100); 'Often/To a high degree' (75), 'Sometimes/Somewhat' (50), 'Seldom/To a low degree' (25), 'Never/Almost never/To a very low degree' (0). For each subscale, the mean of the item scores is calculated to assess frequency or intensity. The internal consistency (reliability) of the CBI was tested using Cronbach's alpha, which revealed very good reliability across all subscales (0.92 personal, 0.86 work, 0.87 client). Single items measured the outcomes of feeling unwell due to work-related stress, being pleased with their standard of care, job satisfaction, and thoughts about leaving midwifery. Each were supplemented with a further question to explore associated reasons with each outcome, the results of which will be reported elsewhere, as will the findings from the free-text comments. With the exception of the question on region, all questions were optional. The estimated time to complete the survey was between 10 and 15 min. Consent was assumed on completion of the survey.

Data analysis

The analyses were performed in IBM SPSS (Version 26). All variables were treated as either categorical or grouped into intervals. 'Work-related stress' and 'Thoughts about leaving' were binary outcome variables, and for the purposes of inferential analysis, the remaining outcome variables were dichotomised to create binary variables. Burnout scores were dichotomised as low to moderate (0–49) and high (50 or more). Univariate analysis identified any explanatory variable with an asymptotic significance (two-sided) p-value <0.1 for inclusion in the multivariable analysis.

Binary logistic regression was performed to generate adjusted odds ratios (OR), 95 % confidence intervals (95 % CI) and p-values for all explanatory variables potentially associated with the outcome variables, with $p < 0.05$ being regarded as statistically significant. For each outcome, three logistic regression models of increasing complexity sequentially demonstrated the interaction and association of each set of explanatory variables with each outcome variable simultaneously. To avoid under- or over-estimation of size of effect, the reference group for the unordered categorical variables were based on the group having a median or mean score closest to the whole sample. Due to the small sample of those working on-call, the unadjusted odds are reported for recovery time from on-calls.

Results

A total of 2347 surveys were completed, with representation from each of the four UK nations (Table 1). In line with the profile of the NMC (2020) register, most respondents were female, but some ethnic groups may have been under-represented. Most were employed at Band 6. The mean length of experience was 11.6 years (SD 10.2), but 53.6 % of the sample had less than 10 years' experience. The mean age was 40.5 years (SD 11.3). Most respondents worked full-time and had less than a 40-minute travel time to work. No respondents in Northern Ireland worked in a caseload/continuity of care model.

In this sample, 12 to 12.5-hour shifts were the most common day and night shift length, although over half had to work mixed shift lengths to

Table 1
Participant characteristics.

Characteristic	n (%)
Region (n = 2347)	
London	150 (6.4)
South East England	357 (15.2)
South West England	319 (13.4)
East of England	237 (10.1)
The Midlands	305 (13.0)
North West of England	179 (7.6)
North East of England	291 (12.4)
Scotland	334 (14.2)
Wales	82 (3.5)
Northern Ireland	93 (4.0)
Band (n = 2342)	
5	272 (11.6)
6	1672 (71.4)
7	398 (17.0)
Length of experience (years) (n = 2342)	
< 1	161 (6.9)
1–4	596 (25.5)
5–9	497 (21.2)
10–14	336 (14.4)
15–19	224 (9.6)
20–29	336 (14.4)
30 or more	192 (8.2)
Age (years) (n = 2338)	
21–25	234(10.0)
26–30	324 (13.9)
31–35	342 (14.6)
36–40	301 (12.9)
41–45	297 (12.7)
46–50	297 (12.7)
51–55	277 (11.9)
56 or over	266 (11.4)
Ethnicity (n = 2327)	
White	2247 (96.6)
Asian/Asian British	17 (0.7)
Mixed/multiple ethnicity	38 (1.6)
Black/African/Caribbean/British	19 (0.8)
Other	6 (0.3)
Gender (n = 2331)	
Female	2320 (99.5)
Male	5 (0.2)
In another way	3 (0.1)
Prefer not to say	3 (0.1)
Travel to work time (n = 2347)	
< 20 mins	902 (38.4)
20–39 mins	1005 (42.8)
40–59 mins	369 (15.7)
1 hour or more	71 (3.0)
Way of working (n = 2347)	
Bank only (temporary contract)	82 (3.5)
Agency only (temporary contract)	2 (0.1)
Contract hours NHS only	1188 (50.6)
Contract hours NHS + agency	11 (0.5)
Contract hours NHS + bank	1064 (45.3)
Weekly hours (n = 2337)	
Full-time (30 h or more)	1733 (74.2)
Part-time 20–29 h	463 (19.8)
Part-time < 20 h	133 (5.7)
Other (variations in bank shifts)	8 (0.3)
Area of work (n = 2341)	
Admissions/triage	67 (2.9)
ANC/DAU/Booking clinic	87 (3.7)
Caseload/Continuity team	151 (6.5)
Community	421 (18.0)
Delivery suite/labour ward	744 (31.8)
Education role in clinical practice*	20 (0.9)
High dependency unit	17 (0.7)
Integrated unit	102 (4.4)
Management role	18 (0.8)
Midwife-led unit	117 (5.0)
Postnatal or antenatal ward	350 (15.0)
Preceptorship period	84 (3.6)
Specialist role*	92 (3.9)
Other	71 (3.0)

ANC: antenatal clinic; DAU: day assessment unit; Education role in practice includes practice educators, practice development midwives. Specialist role e.g. diabetic, perinatal mental health midwives.

make up weekly hours or because of study/training days (Table 2). Just over a third of the sample were required to work on-calls. A paired t-test showed that for all regions, the mean number of on-calls over a 4-week period was significantly greater for continuity of care midwives than those in community (Mean difference = 3.022, 95 % CI 1.807, 4.238, $p <$ 0.001). Just 42 % of those working on-calls had less than a 20-minute journey to work, and most (85 %) did not have formal methods in place to ensure their working pattern and on-calls allowed them sufficient recovery time before being back on duty. Most midwives received their off-duty 4–6 weeks in advance. In the previous month, 88 % rarely or never finished their shifts on time and 75 % were unable to take all their allocated rest breaks, with just over half reporting that there was a formal method in place to record missed breaks. Reasons for not finishing on time were provided by 2344 midwives. The most common reason for not finishing on time was due to workload and paperwork (75.3 %), followed by the length of time to handover (45.1 %) and staffing issues (41.2 %). A total of 2253 midwives provided reasons for missed (or shortened) rest breaks. The top three reasons were the ongoing demands of the unit (70.3 %), staffing issues (67.5 %) and workoverload or paperwork (64.9 %) (see Supplementary file 2 for full results).

Most midwives (70 %) working shifts of 12 h or more had a maximum of 3 or 4 consecutive shifts, as did 53 % of midwives working 10 to 11.5-hour shifts, but there was wide variation for those working up to 8.5-hour shifts. A total of 514 only worked day shifts, and 42 only worked night shifts. Of the remaining midwives, 75 % were scheduled to start a day shift within 24 h of finishing a night shift. Half of midwives reported being called away from a mandatory training session to provide care in the unit, mainly due to staffing issues. Other reasons were due to sessions being cancelled due to Covid-19 or that the specialist skills of the midwife were required. Most midwives (73 %) felt that the Covid-19 pandemic had a significant or somewhat negative effect on their wellbeing at work. A small minority felt it had a positive effect (feeling more valued or improved teamwork).

A high proportion of midwives reported feeling unwell due to workrelated stress in the past year, with just 39 % satisfied in their job and over 75 % with thoughts about leaving midwifery (Table 3). There were no significant differences between regions for these outcome variables (X^2 7.863, df=9, p = 0.548, n = 2329; X^2 12.560, df=9, p = 0.184, n = 2335; X^2 11.670, df=9, p = 0.233, n = 2309 respectively). There were high levels of personal (76 %) and work-related burnout (83 %) (scores of 50 or more), but much lower levels of client-related burnout (17 %). Half agreed that they were pleased with the standard of care they could provide.

Table 4 depicts the variables indicated for inclusion in the univariate analysis and represent the fully adjusted OR (Model 3) for each outcome (see Supplementary file 3 for full models). The region in which a midwife worked potentially moderated outcomes, positively or negatively. Midwives in Scotland had reduced odds of client-related burnout, but there was no clear reason to explain this, or why midwives in London, Wales or Northern Ireland had increased odds of being pleased with their standard of care. Midwives in the East of England had reduced odds of being pleased, which may reflect the higher proportion of midwives in this region with impaired recovery opportunities.

Band 5 midwives had increased odds of job satisfaction and reduced odds of client-related burnout and thoughts about leaving. Length of experience was only influential for work-related stress and work-related burnout, and midwives with less than one years' experience had the highest odds in both. However, all midwives with less than 20 years' experience had increased odds of work-related burnout, suggesting other factors may mediate this association. A commute time of 40 min or more was associated with reduced odds of being pleased with their

Table 2
Working practices.

Working practices	n (%)
Day shift length (n = 2345)	
8-hr	739 (31.5)
10-hr	251 (10.7)
12-hr	1074 (45.8)
13-hr	245 (10.5)
Don't/rarely work days	16 (0.7)
Other	20 (0.9)
Night shift length (n = 2339)	
8-hr	20 (0.9)
10-hr	440 (18.8)
12-hr	1250 (53.4)
13-hr	68 (2.9)
Don't/rarely work nights	560 (23.9)
Other	1 (0.04)
Requirement to work mixed shift lengths (n = 2342)	
No	1056 (45.1)
Yes	1286 (54.9)
Requirement to work on-calls (n = 2341)	
No	1498 (64.0)
Yes	843 (36.0)
Number of on-calls per month (n = 831)	
<1	55 (6.6)
1–2	324 (39.0)
3–4	250 (30.1)
5–8	136 (16.4)
9–12	40 (4.8)
13+	12 (1.4)
Other	14 (1.7)
Formal methods in place to ensure sufficient recovery time for on-call work (n = 833)	
No	480 (57.6)
Yes, but informal arrangements	233 (28.0)
Yes, formal arrangements in place	120 (14.4)
Advance release of off-duty (n = 2276)**	
<4 weeks	403 (17.7)
4–6 weeks	1105 (48.6)
6–8 weeks	622 (27.3)
8+ weeks	146 (6.4)
Frequency of finishing shifts on time (n = 2331)	
Always	64 (2.8)
Nearly always	966 (41.4)
Rarely	1095 (47.0)
Never	206 (8.8)
Rest breaks in operation (n = 2322)	
20 min	40 (1.7)
1 × 30 min	977 (42.1)
1 × 45 min	57 (2.5)
2 × 30 min	418 (18.0)
2 × 45 min	37 (1.6)
1 × 1 h	718 (30.9)
Other	75 (3.2)
Ability to take rest break(s) in previous month (n = 2329)	
Unable to take all breaks	1761 (75.6)
Tend not to get 2nd break*	212 (9.1)
Not missed but can be cut short	251 (10.8)
Able to take all breaks	105 (4.5)
Awareness of formal methods to record missed rest breaks (n = 2329)	
Yes, aware	1244 (53.4)
Not aware	816 (35.0)
I don't know	269 (11.6)
Max. no. of consecutive shifts (n = 2330)	
2	168 (7.2)
3–4	1218 (52.3)
5 or more	827 (35.5)
My choice (self-roster/bank/agency)	117 (5.0)
Scheduled to work a day shift within 24 hrs of finishing a night shift (n = 1744)	
Yes	1344 (75.8)
No	430 (24.2)
Called away from a mandatory training session in past year (n = 2314)	
Yes	1161 (50.2)
No	1153 (49.8)
Reason for being called away from mandatory training (n = 1156)	
Generally inadequate staffing	881 (76.2)
Unexpected high activity levels	153 (13.2)
To cover staff sickness	98 (8.5)
Other	24 (2.1)
Impact of Covid-19 on emotional wellbeing (n = 2337)	
Significant negative effect	651 (27.9)
Somewhat negative effect	1063 (45.5)
No particular change	542 (23.2)
Somewhat positive effect	58 (2.5)
Significant positive effect	23 (1.0)

* Missed 2nd break refers to break split into two (e.g. 2 × 30 mins instead of 1-hour).
** In the UK, off-duty refers to work rosters/rotas.

standard of care, and a commute of one-hour or more increased the odds of thinking about leaving. Working less than 20-hours per week was protective for work-related stress, personal and work-related burnout. Only one work area was consistently associated with the outcomes of interest. Those working on the postnatal/antenatal ward had increased odds of work-related burnout and reduced odds of being pleased with their standard of care and job satisfaction. Compared to those working 12 to 12.5 hour shifts, those working shifts of 10 to 11.5 h had reduced odds of personal burnout and thoughts about leaving, and increased odds of being pleased with their standard of care. Those working shifts >12.5 h had increased odds of being pleased with their standard of care.

Not being able to finish on time increased the odds of work-related stress, personal and work-related burnout and thoughts about leaving, and reduced the odds of being pleased with the standard of care and job satisfaction. Missed rest breaks increased the odds of work-related stress, whilst missing a second break increased the odds of work-related stress and work-related burnout. Not being aware of formal methods to record missed breaks was associated with increased odds of personal burnout and reduced the odds of being pleased with their standard of care and job satisfaction. Being called away from a mandatory training session increased the odds of work- and client-related burnout, and reduced the odds of being pleased with their standard of care and job satisfaction. The later the off-duty was received, the more negative the outcomes. However, only those who received their off-duty less than 4 weeks in advance of scheduled shifts had increased odds of work-related stress and work-related burnout, and reduced odds of job satisfaction.

Being scheduled to start a day shift within 24 h of finishing a night shift was associated with increased odds of work-related burnout and thoughts about leaving, and reduced odds of being pleased with their standard of care and job satisfaction. The negative impact of Covid-19 on midwives' emotional wellbeing was evident across all outcomes. On-call working was not associated with any outcome, but the way they were managed was. When no formal methods were in place to ensure sufficient recovery time from on-calls before being back on duty it was associated with increased odds of work-related stress, personal, work- and client-related burnout and thoughts about leaving, and reduced odds of being pleased with their standard of care and job satisfaction (Table 5). When informal methods were in place it appeared to offer

Table 3
Emotional wellbeing outcomes.

Emotional wellbeing outcomes	Statistic
Felt unwell due to work-related	
stress in past year ($n = 2329$)	n (%)
Yes	1908 (81.9)
No	421 (18.1)
Burnout (CBI)	Mean (SD)
Personal burnout ($n = 2343$)	62.5 (19.8)
Work-related burnout ($n = 2344$)	65.1 (17.6)
Client-related burnout ($n = 2341$)	29.3 (19.8)
Prevalence of burnout	
Personal burnout ($n = 2343$)	n (%)
7 (0.3)	
1–25	124 (5.3)
26–49	411 (17.5)
50–74	1026 (43.8)
75–99	693 (29.6)
100	82 (3.5)
Work-related burnout ($n = 2344$)	
0	0
1–25	59 (2.5)
26–49	335 (14.3)
50–74	1155 (49.3)
75–99	771 (32.9)
100	24 (1.0)
Client-related burnout ($n = 2341$)	
0	176 (7.5)
1–25	956 (40.8)
26–49	808 (34.5)
50–74	338 (14.4)
75–99	57 (2.4)
100	6 (0.3)
Ability to do job to a standard midwives'	
are pleased with ($n = 2340$)	n (%)
Strongly agree	137 (5.9)
Agree	1044 (44.6)
Disagree	908 (38.8)
Strongly disagree	251 (10.7)
Level of job satisfaction ($n = 2335$)	n (%)
Very satisfied	69 (3.0)
Mostly satisfied	849 (36.4)
Sometimes dissatisfied	991 (42.4)
Very dissatisfied	426 (18.2)
Thoughts about leaving midwifery ($n = 2309$)	n (%)
Yes	1760 (76.2)
No	549 (23.8)

some protection but was still associated with increased odds of work-related burnout.

Discussion

This study found higher levels of work-related stress (81.9 %) than an earlier Royal College of Midwives (2016) survey (64 %). The prevalence of personal burnout was lower than a previous UK study of midwives (Hunter et al., 2019), which included non-clinical midwives (76.9% vs 82.8 %) but higher for work- (83.2% vs 67.3 %) and client-related burnout (17.1% vs 15.5 %). However, client-related burnout was generally low, which might suggest that it is not the essence of midwifery work that is the issue, but rather the toll of how midwives are expected to work. Seventy-five percent of midwives thought about leaving, but it is important to note that this study measured thoughts, rather than actual intent.

This research has demonstrated consistent associations with two interlinked categories that reflect different aspects of job design: 'Intershift recovery' (the ability to rest and recover between shifts) and 'Midwifery safe staffing indicators'. Restrictions on recovery are also evident in the safe staffing indicators, which are directly or indirectly related to staffing issues (National Institute for Health and Care Excellence (NICE), 2015. These indicators include monitoring the extent of working beyond contracted hours, missed breaks, ability to attend mandatory training (NICE, 2015; National Quality Board, 2016) or the late release of off-duty (less than six weeks in advance of scheduled shifts) (NHS England and NHS Improvement, 2019).

In the field of recovery research, perceptions of job conditions and job-related behaviours influence recovery experiences, which in turn, influence employee wellbeing and performance (Sonnentag et al., 2017). Recovery (physical and psychological detachment from work) spans various timeframes, for example, externally (outside working hours), or internally (temporarily disengaging from work tasks, e.g. rest breaks). (Cropley et al., 2020). When job demands are high, and job control is low, it restricts internal recovery, and when staff have to work beyond their formal hours, it inhibits external recovery (Taris et al., 2006). When internal recovery is impeded, it heightens the importance of external recovery, which is potentially the greater mediator of the two as full psychological detachment during rest breaks is unlikely to be feasible and would require more mental effort on return, whilst fatigue that is not resolved outside the workplace will continue to deplete emotional resources (Sonnentag et al., 2017; Cropley et al., 2020). Full detachment can also be hampered when staff continue to think about upcoming workdays on their days off, which may occur more often when previous workdays have been stressful (Sonnentag and Fritz, 2014). This may explain why this study found that the ability to finish on time (inhibiting external recovery) appeared to be more influential on outcomes than the ability to take a rest break (internal recovery), yet an organisation's approach in formally recording missed rest breaks was also influential. However, research examining internal recovery (rest breaks) has received far less attention than external recovery (Cropley et al., 2020), as has the complex nature of recovery among shift workers (Sonnentag et al., 2017).

This study introduced novel forms of enquiry by exploring how a formal approach to record missed rest breaks or on-call recovery, and being called away from a mandatory training session might influence outcomes, which is not evident in previous nursing or midwifery research, or within the wider literature. In previous midwifery studies in England (Sandall, 1998) and The Netherlands (Warmelink et al., 2015), the requirement to work on-calls has been viewed negatively, contributing to job dissatisfaction, whilst in Western Canada it has been linked with higher intentions of leaving (Stoll and Gallagher, 2019). The findings of the current study suggest that an organisation's approach in ensuring sufficient recovery time from on-call working has more influence on outcomes than the requirement to work on-calls.

The association between the timing of off-duty release or the effect of shift schedules has not previously been described in the midwifery literature. Pooled data from studies across different industries found that one recovery day after night shifts was insufficient, but two days could generally mitigate the effects of fatigue (Wong et al., 2019). The evidence found within the current study further supports this assertion, reinforcing the need for organisations to consider impeded recovery when scheduling night to day shift rotations.

Potential moderators

Given that many explanatory variables associated with poorer outcomes were related to safe staffing indicators, staffing is considered a moderator, potentially having a domino effect on working practices and emotional wellbeing outcomes. The reasons for more positive outcomes in some regions were unclear, but may be better understood in the broad context of the work environment and available resources, including staffing.

A previous midwifery study in England (Sandall, 1998) found higher levels of emotional exhaustion for the lowest band. In contrast, this study appeared to show better outcomes for this group (Band 5). This may be due to their newly-qualified status, thus any long-term exposure to working practices may not yet be apparent. The reduced odds of client-related burnout for Band 7 might be due to their position of authority and being less likely to provide regular, direct care for women.

Table 4
Logistic regression results for final model: all outcomes.

Variables Included in regression	Work-related stress OR (95 % CI)	Personal burnout OR (95 % CI) (n = 2136)	Work-related burnout OR (95 % CI) (n = 2225)	Client-related burnout OR (95 % CI) (n = 2145)	Standard of Care OR (95 % CI) (n = 2290)	Job Satisfaction OR (95 % CI) (n = 2159)	Thoughts about leaving OR (95 % CI) (n = 2162)
Region							
South East (Ref)							
London		0.714 (0.445, 1.146)	0.797 (0.447, 1.421)	1.477 (0.919, 2.374)	1.854 (1.182, 2.908)**		
South West		1.131 (0.754, 1.695)	1.073 (0.661, 1.740)	1.083 (0.728, 1.610)	1.033 (0.729, 1.466)		
East of England		1.272 (0.810, 1.995)	1.408 (0.807, 2.455)	0.647 (0.405, 1.035)	0.664 (0.456,0.968)*		
Midlands		1.180 (0.778, 1.791)	1.479 (0.880, 2.484)	1.179 (0.796, 1.747)	0.882 (0.621, 1.251)		
North West		0.987 (0.618, 1.574)	0.931 (0.532, 1.629)	0.818 (0.505, 1.324)	0.879 (0.583, 1.323)		
North East		0.781 (0.523, 1.166)	1.217 (0.734, 2.019)	0.779 (0.510, 1.188)	1.168 (0.815, 1.673)		
Scotland		0.957 (0.631, 1.450)	0.956 (0.571, 1.600)	0.513 (0.329, 0.800)**	1.321 (0.915, 1.908)		
Wales		0.812 (0.444, 1.487)	0.901 (0.433, 1.875)	0.559 (0.263, 1.188)	1.836 (1.028, 3.279)*		
Northern Ireland		1.126 (0.604, 2.096)	0.477 (0.213, 1.072)	0.832 (0.446, 1.553)	2.172 (1.195, 3.947)*		
Band							
6 (Ref)							
5	0.566 (0.322, 0.997)*		0.742 (0.393, 1.403)	0.468 (0.284, 0.770)**		1.599 (1.146, 2.233)**	0.578 (0.366, 0.913)*
7		0.713 (0.492, 1.035)		0.726 (0.489, 1.077)	0.595 (0.416, 0.849)**	1.207 (0.918, 1.587)	0.637 (0.457,0.890)**
Experience (years)							
30+ (Ref)							0.638 (0.319, 1.277)
< 1	3.513 (1.319, 9.362)*	1.213 (0.603, 2.442)	4.387(1.485, 12.957)**				*(Ref)*
1–4	2.170 (1.050, 4.485)*	1.592 (0.869, 2.918)	2.276 (1.070, 4.840)*				0.913 (0.548, 1.522)
5–9	1.695 (0.860, 3.340)	1.651 (0.921, 2.961)	2.650 (1.305, 5.381)**				1.204 (0.664, 2.184)
10–14	1.621 (0.849, 3.093)	1.121 (0.646, 1.943)	1.981 (1.034, 3.798)*				1.389 (0.731, 2.642)
15–19	1.417 (0.753, 2.666)	1.097 (0.627, 1.921)	2.022 (1.054, 3.879)*				1.546 (0.782, 3.056)
20–29	1.701 (0.965, 3.001)	1.525 (0.927, 2.509)	1.759 (0.995, 3.109)				1.102 (0.583, 2.084)
Travel to work time							
< 20 min (Ref)							
20–39 min					0.971 (0.792, 1.189)		1.213 (0.958, 1.536)
40–59 min					0.752 (0.572, 0.989)*		1.107 (0.811, 1.510)
1 h+					0.560 (0.314, 0.998)*		2.573 (1.162, 5.695)*
Weekly hours							
Full-time 30+ (Ref)							
Part-time < 20	0.517 (0.276, 0.969)*	0.363 (0.221, 0.597)***	0.439 (0.231, 0.835)*		1.063 (0.656, 1.722)	1.240 (0.769, 1.999)	1.655 (0.868, 3.157)
Part-time 20–29	0.805 (0.577, 1.122)	0.921 (0.688, 1.235)	0.857 (0.598, 1.227)		0.822 (0.643, 1.050)	0.788 (0.617, 1.007)	1.004 (0.744,1.356)
Area of work							
Delivery suite	*(Ref)*		*(Ref)*	0.940 (0.683, 1.294)	*(Ref)*	0.967 (0.655, 1.429)	*(Ref)*
Admissions/Triage	1.111 (0.543, 2.273)		2.934 (1.006, 8.556)*	1.750 (0.964, 3.177)	0.737 (0.424, 1.281)	0.789 (0.411, 1.503)	1.923 (0.929, 3.984)
ANC/DAU/Bookings	0.978 (0.498, 1.922)		2.376 (1.002, 5.635)*	0.917 (0.494, 1.704)	0.775 (0.447, 1.344)	0.680 (0.356, 1.298)	1.864 (0.922, 3.768)
Continuity	1.370 (0.741, 2.535)		1.119 (0.593, 2.112)	0.582 (0.336, 1.007)	1.011 (0.657, 1.555)	*(Ref)*	0.885 (0.554, 1.414)
Community	1.249 (0.750, 2.082)		1.013 (0.587, 1.746)	*(Ref)*	1.365 (0.932, 1.999)	0.830 (0.541, 1.273)	1.527 (0.991, 2.353)
Management/ Education	1.082 (0.385, 3.042)		1.532 (0.509, 4.609)	1.052 (0.401, 2.761)	1.145 (0.534, 2.454)	0.679 (0.287, 1.606)	0.756 (0.331, 1.729)
Integrated unit	1.269 (0.642, 2.508)		1.428 (0.663, 3.074)	0.921 (0.515, 1.647)	0.756 (0.469, 1.218)	0.743 (0.421, 1.311)	1.615 (0.876, 2.979)
Midwifery-led unit	0.818 (0.493, 1.357)		0.680 (0.400, 1.154)	0.407 (0.202, 0.820)*	1.050 (0.679, 1.624)	1.200 (0.711, 2.026)	0.966 (0.602, 1.550)

(*continued on next page*)

Table 4 (*continued*)

Variables Included in regression	Work-related stress OR (95 % CI)	Personal burnout OR (95 % CI) (n = 2136)	Work-related burnout OR (95 % CI) (n = 2225)	Client-related burnout OR (95 % CI) (n = 2145)	Standard of Care OR (95 % CI) (n = 2290)	Job Satisfaction OR (95 % CI) (n = 2159)	Thoughts about leaving OR (95 % CI) (n = 2162)
PN/AN ward	1.351 (0.910, 2.006)		1.609 (1.009, 2.567)*	0.926 (0.634, 1.354)	0.465 (0.346, 0.625)***	0.594 (0.384, 0.920)*	1.228 (0.875, 1.724)
Preceptorship	1.148 (0.556, 2.370)		0.712 (0.306, 1.658)	0.918 (0.388, 2.171)	1.181 (0.716, 1.950)	0.862 (0.451, 1.650)	0.907 (0.506, 1.624)
Specialist role	1.667 (0.779, 3.568)		1.698 (0.780, 3.696)	1.394 (0.759, 2.562)	0.832 (0.482, 1.435)	1.033 (0.556, 1.919)	2.320 (1.128, 4.770)*
Other	0.998 (0.501, 1.990)		1.054 (0.500, 2.221)	1.038 (0.525, 2.055)	0.844 (0.485, 1.469)	0.572 (0.297, 1.104)	1.048 (0.561, 1.959)
Day shift length							
12–12.5 h (Ref)							
<8.5 h	1.269 (0.830, 1.940)	1.021 (0.729, 1.430)	0.901 (0.547, 1.484)		1.250 (0.881, 1.774)		1.003 (0.674, 1.491)
10–11.15 h	0.742 (0.492, 1.119)	0.629 (0.442, 0.897)*	0.561 (0.358, 0.879)*		1.493 (1.063, 2.095)*		0.575 (0.398, 0.829)**
>12.5 h	1.231 (0.810, 1.872)	0.954 (0.659, 1.383)	1.242 (0.748, 2.060)		1.480 (1.073, 2.042)*		0.983 (0.686, 1.407)
Don't/rarely work these	2.117 (0.667, 6.725)	0.769 (0.349, 1.690)	0.753 (0.290, 1.954)		1.210 (0.559, 2.620)		1.730 (0.616, 4.858)
Release of off-duty (weeks)							
6–8 (Ref)							
< 4	1.930 (1.287, 2.895)**		1.664 (1.070, 2.586)*		0.769 (0.495, 1.194)	0.693 (0.519, 0.926)*	1.089 (0.777, 1.527)
4–6	1.285 (0.977, 1.690)		1.266 (0.939, 1.706)		0.876 (0.593, 1.293)	0.836 (0.672, 1.040)	1.135 (0.884, 1.458)
8+	1.270 (0.752, 2.146)		1.108 (0.650, 1.888)		0.937 (0.624, 1.406)	1.224 (0.843, 1.822)	0.943 (0.602, 1.475)
Ability to finish on time							
Always (Ref)							
Never	4.404 (1.877, 10.335)***	3.211 (1.573, 6.556)**	2.949 (1.218, 7.140)*		0.312 (0.152, 0.637)**	0.279 (0.140,0.555)***	2.819 (1.319, 6.021)**
Rarely	2.415 (1.224, 4.762)*	2.176 (1.202, 3.937)*	2.172 (1.039, 4.542)*		0.487 (0.255, 0.930)*	0.373 (0.203, 0.686)**	2.087 (1.097,3.969)*
Nearly always	1.431 (0.732, 2.795)	1.343 (0.748, 2.412)	1.109 (0.538, 2.286)		0.866 (0.454, 1.650)	0.663 (0.361, 1.217)	1.155 (0.611, 2.181)
Missed rest breaks							
No (Ref)							
Yes	2.371 (1.414, 3.973)**	1.488 (0.928, 2.385)	1.374 (0.790, 2.389)		0.632 (0.383, 1.045)	1.001 (0.625, 1.602)	1.289 (0.789, 2.107)
Yes, miss 2nd break	2.173 (1.144, 4.127)*	1.732 (0.958, 3.130)	2.919 (1.327, 6.418)**		0.580 (0.325, 1.035)	0.928 (0.534, 1.611)	1.727 (0.942, 3.167)
No, but can be cut short	0.980 (0.554, 1.736)	1.348 (0.786, 2.310)	1.210 (0.642, 2.281)		0.901 (0.513, 1.582)	1.118 (0.660, 1.895)	1.269 (0.726, 2.219)
Aware of formal methods to record missed rest breaks							
Yes (Ref)							
No/don't know	1.112 (0.866, 1.428)	1.470 (1.176, 1.836)**	1.278 (0.965, 1.693)		0.798 (0.656, 0.970)*	0.820 (0.679, 0.991)*	1.148 (0.919, 1.434)
Day shift within 24 h of finishing night shift							
No (Ref)							
Yes	1.089 (0.824, 1.437)	1.242 (0.978, 1.577)	1.606 (1.191, 2.166)**		0.753 (0.608, 0.932)**	0.784 (0.635, 0.969)*	1.536 (1.205,1.957)**
Called away from mandatory training							
No (Ref)							
Yes	1.216 (0.943, 1.567)	1.182 (0.948, 1.473)	1.598 (1.214, 2.105)**	1.300 (1.036, 1.631)*	0.719 (0.595, 0.869)**	0.727 (0.601, 0.880)**	1.116 (0.894, 1.393)
Impact of Covid-19 on emotional wellbeing							
No change/minimal (Ref)							
Negative	2.010 (1.537, 2.629)***	2.214 (1.748, 2805)***	2.415 (1.812, 3.221)***	1.442 (1.081, 1.922)*	0.697 (0.558, 0.870)**	0.502 (0.404, 0.624)***	1.526 (1.195, 1.948)**
Positive	0.489 (0.283, 0.844)*	1.341 (0.776, 2.316)	0.753 (0.415, 1.366)	0.916 (0.445, 1.884)	1.038 (0.612, 1.759)	1.658 (0.981, 2.804)	0.748 (0.434, 1.289)

Model 3: Controlled for individual, work-related and working practices variables indicated for inclusion in the initial main-effects model. Where no results for an explanatory variable are shown, that variable was not indicated for inclusion. The variables 'Age', 'Requirement to work Mixed shift lengths' and 'Requirement to work

on-calls' were included in analysis, but as no statistically significant associations were found, these are not shown (see Suppl. File for full findings). The variables 'Way of working', 'Length of rest break' and 'Number of consecutive shifts' were included in the analysis, but are not shown in Table due to the possibility of spurious or chance findings (see limitations).

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 5
Crude odds for emotional wellbeing outcomes: Formal methods in place to ensure sufficient recovery time for on-call working.

	Work-related stress OR (95 % CI) p-value p-value (n = 825)	Personal Burnout OR (95 % CI) p-value p-value (n = 831)	Work-related burnout OR (95 % CI) p-value p-value (n = 832)	Client-related burnout OR (95 % CI) p-value (n = 830)	Standard of care OR (95 % CI) (n = 829)	Job satisfaction OR (95 % CI) (n = 830)	Thoughts about leaving OR (95 % CI) (n = 821)
Yes, formal methods *(Ref)*							
No	2.824 (1.715, 4.650)	2.470 (1.558, 3.914)	4.971 (3.122, 7.915)	2.390 (1.266, 4.513)	0.381 (0.248, 0.586)	0.432 (0.288, 0.646)	2.361 (1.508, 3.696)
	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p = 0.007$	$p < 0.001$	$p < 0.001$	$p < 0.001$
Informal methods	1.305 (0.779, 2.187)	1.166 (0.720, 1.889)	1.817 (1.134, 2.912)	1.406 (0.696, 2.843)	0.653(0.408, 1.046)	0.747 (0.480,1.162)	1.388 (0.860, 2.241)
	$p = 0.312$	$p = 0.720$	$p = 0.013$	$p = 0.342$	$p = 0.076$	$p = 0.196$	$p = 0.179$

36 % of the sample worked on-calls.

Only one previous midwifery study in Jordan (Mohammad et al., 2020) controlled for any working practices (shift type) in their analysis, finding increased odds of work-related burnout in those with less than 10 years' experience. In the current study, all midwives with less than 20 years' experience had increased odds of burnout, but those with less than one year's experience had the highest odds. It was unclear whether this was related to the transition from student to registered midwife, entry band and level of responsibility, length of preceptorship period, or a combination of all these factors, so further research is recommended.

Only one previous midwifery study, conducted in England, considered the effect of travel time (Sandall, 1998), linking longer work commutes with higher levels of emotional exhaustion. Commute stress is suggested as a mediator for job satisfaction, commitment, and intentions to leave (Novaco and Gonzalez, 2009). This study found no association with burnout, but longer commutes were linked with negative views on the standard of care midwives could provide and increased thoughts about leaving. Inclusion of this variable supports the view that commute time could influence outcomes.

Previous non-UK studies have found no difference in weekly hours and burnout (Henriksen et al., 2013; Newton et al., 2014), or only a very weak association (Dixon et al., 2017). Controlling for the effect of a wide range of variables, this study provided a new insight on the effect of weekly hours. Working less than 20-hours per week was protective, which might suggest the cumulative effect of shift work and/or recovery time between shifts are important mediators.

In contrast to the findings of Fenwick et al. (2018a), this study found that working in a continuity model was not significantly associated with better outcomes. Only those working on the postnatal/antenatal ward had consistently poorer outcomes. Other studies have chosen different work areas and reference groups to compare, so results generated, including any significant effects, are relative to the reference level of the chosen group. There are variations in midwifery staffing across postnatal/antenatal wards in Great Britain (National Maternity and Perinatal Audit Project Team, 2017), so further research may be beneficial to explore outcomes related to work areas, considering the availability of support staff and midwife/women ratios.

Despite poorer outcomes being reported for 12-hour shifts in the nursing literature (Dall'Ora et al., 2015), this study found that longer shifts were not associated with poorer outcomes. The ability to rest and recover during or after shifts is likely to mitigate any adverse effects of longer shifts. Interestingly, this study found that 10 to 11.5-hour shifts were associated with better outcomes. A scoping review of nurses' experiences and opinions around shift length (Ejebu et al., 2021) revealed a lack of previous studies that have explored outcomes related to 10-hour shifts, as studies generally explored opinions or outcomes based on one shift length (typically 12-hour) or early, late or night shifts. A 10-hour shift may still achieve a compressed working week that may be less arduous than longer shifts so the mediating effects of this shift may be an area worthy of further exploration.

Implications and recommendations for midwifery practice

Whilst there is no optimal shift system that will suit everyone (Health and Safety Executive (HSE), 2006), poorly designed shift work schedules can result in sleep impairments, fatigue and have a negative impact on recovery processes (Wong et al., 2019). In the UK, the law concerning working hours, rest periods and rest breaks is governed by the Working Time Regulations GB (1998)(as amended). However, compliance with the Working Time Regulations alone cannot fully mitigate the effects of fatigue and would not protect against short recovery periods when midwives are scheduled to start a day shift within 24 h of finishing a night shift, or when there is no monitoring of recovery time from on-call schedules. Modifying policies or aspects of job design might promote safer working practices and supportive cultures, which could lead to better emotional wellbeing outcomes and potentially improve retention. Workplace fatigue, especially among shift workers, is not uncommon and cannot easily be eliminated so workplace strategies should focus on limiting and managing fatigue by identifying and monitoring risk factors Wong et al., 2019). Safety critical industries, such as transportation or aviation, have policies in place to monitor and manage fatigue-related risks in workers due to the detrimental effect it can have on performance, alertness and the increased risk of adverse outcomes (Gaba and Howard, 2002). It could be argued that the same safeguards should be robustly applied within the NHS. It is not suggested that having formal records to monitor recovery from working practices would immediately improve outcomes, but it could be seen as a barometer of the culture of a unit as it defines the compassion, commitment and willingness of an organisation, or its leaders, to monitor and review the wellbeing of their staff.

To mitigate the effects of fatigue, the design of effective work schedules necessitates the consideration of rest breaks within a shift and intershift recovery time (Wong et al., 2019). Changes to scheduling practices should be considered that go beyond basic compliance with the Working Time Regulations. Shift scheduling should follow good practice guidance (HSE, 2006) and ensure that a minimum of two nights' sleep is scheduled between night and day shifts. National guidance (NICE, 2015) already suggests that maternity services should monitor missed rest breaks and extra hours worked as an indicator of safe staffing, but

implementing formal (and mandatory) methods to record these could serve as an additional indicator for impeded recovery, which could be supplemented by formal methods to monitor recovery time from on-call schedules. Off-duty should be approved and published at least six weeks in advance of scheduled shifts and used as an additional indicator of staffing capacity. This approach could provide objective data that strengthens current methods to review safe staffing levels and could be used by NHS Boards as a supplementary measure to review midwifery staffing budgets (NICE, 2015).

Strengths and limitations

A strength of this study is the large sample size, focusing solely on midwives working clinically in the NHS. This survey is the first to include and control for a wide range of working practices variables that have not previously been examined in relation to the outcomes of interest, demonstrating associations that have not been previously described within the midwifery literature. Therefore, these findings are potentially relevant and applicable to midwives working outside of the UK, so future research to explore these factors in other countries is recommended. The cross-sectional design was appropriate to explore potential associations (rather than causality) between and among the variables related to emotional wellbeing outcomes. Extraneous variables were identified and controlled for to minimise bias, including the effect of Covid-19. The anonymity of the survey and method of recruitment meant duplicate responses or completion by ineligible participants (although thought unlikely) were difficult to identify, but none were overtly detected during data screening. Midwives who were experiencing poorer emotional wellbeing may have been overrepresented as they might have felt more compelled to complete the survey, but conversely, they may not have felt able or willing to take part. There were low levels of item non-response (< 1.4 %), minimising potential bias due to missing observations. It is acknowledged that burnout is not a dichotomous variable and there is no clinically validated cut off point, however, this approach is practical for statistical analysis within research studies (Dyrbye et al., 2009). Numerous variables were indicated for inclusion in the multivariable analysis, potentially increasing the risk of spurious or chance findings. Midwives who worked bank or agency shifts in addition to their contractual hours had marginally reduced odds of work-related burnout and increased odds of job satisfaction. This cannot be fully explained by part-time working and arranging extra shifts at times that suit them as only 20 % of midwives worked this way. Therefore, this finding appears counterintuitive as it could suggest that any midwife who opts to work extra shifts will experience better outcomes, so it is regarded as a possible spurious finding. Rest breaks of 30- or 45- minutes were each only associated with one outcome. Whilst this might suggest inadequate rest periods for the length of the working day, the inconsistency in findings suggests the possibility of chance. Midwives scheduled to work a maximum of two consecutive shifts had increased odds of personal burnout, which might be related to the organisation of home or family life, where midwives may prefer to work all shifts together. However, as this variable was not associated with any other outcome, it suggests a possible anomaly. This study's comprehensive analysis offered new insights to current understanding, yet this inevitably meant it also raised further questions. The effect of the timing of rest breaks, uptake of informal or formal tea breaks or the break environment was not measured, so future research may be beneficial to explore and control for their effects on outcomes.

Conclusion

This research has provided new insights that contribute to a better understanding of how job design and staffing can influence emotional wellbeing outcomes of midwives working in the NHS. There were consistent associations between impeded recovery time from current working practices and poorer emotional wellbeing outcomes that potentially influence midwives' ability to provide safe and effective care. Ultimately, an organisation-wide approach that includes formal policies and practices for managing people and monitoring fatigue, including the potential impact of job design is essential to minimise the toll of working practices and promote an optimal working environment. This approach may encourage retention by actively ensuring midwives to have time to rest and recover to best support those in their care.

Problem: Exposure to long working hours, fatigue and excessive or prolonged emotional demands all increase the risks of negative emotional wellbeing outcomes.

What is already known: There is conflicting evidence on whether factors such as age, having children or years of experience, influence outcomes in midwives, which may be due to the methods of analysis or differences in the samples.

What this paper adds: This is the first known survey of midwives to include and control for a wide range of working practices variables that have not previously been examined in relation to the outcomes of interest, demonstrating associations related to aspects of job design that have not been previously described within the midwifery literature.

Author agreement

I confirm that this article is the authors original work and that it has not been published elsewhere or being considered for publication elsewhere. All authors have approved the manuscript for submission.

Ethical statement

Ethical approval for the survey was granted by The University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority on 9th June 2020, Protocol number: HSK/SF/UH/04183.

CRediT authorship contribution statement

Jackie Dent: . **Nigel Smeeton:** Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization. **Lisa Whiting:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Tim Watson:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of competing interest

None.

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Supplementary materials

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