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The psychological impact of working in paediatric intensive care. A UK-wide prevalence study.

Gareth AL Jones (1), Gillian Colville (2), Padmanabhan Ramnarayan (3), Kerry Woolfall (4), Yvonne Heward (5), Rachael Morrison (5), Amy Savage (6), James Fraser (7), Michael J Griksaitis (6) and David P Inwald (1), on behalf of the Paediatric Intensive Care Society

1. Imperial College Healthcare NHS Trust, London, England
2. St George's University Hospitals NHS Foundation Trust, London, England
3. Children's Acute Transport Service, Great Ormond Street Hospital for Children NHS Trust, London, England
4. Institute of Population Health Sciences, University of Liverpool, Liverpool, England
5. Birmingham Women's and Children's NHS Foundation Trust, Birmingham, England
6. University Hospital of Southampton NHS Foundation Trust, Southampton, England
7. University Hospitals Bristol NHS Foundation Trust, Bristol, England

Corresponding author:

Dr David Inwald, Paediatric Intensive Care Unit, QEQM building, St Mary's Hospital, Imperial College Healthcare NHS Trust, London W2 1NY, ENGLAND

Email: d.inwald@imperial.ac.uk

Telephone: +44 (20) 3312 2461

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Abstract

Objective

To determine the prevalence of work related psychological distress in staff working in UK paediatric intensive care units (PICUs).

Design

Online (Qualtrics LLC) staff questionnaire, conducted April – May 2018.

Setting

Staff working in 29 PICUs and 10 PICU transport services were invited to participate.

Participants

1656 staff completed the survey: 1194 nurses, 270 physicians and 192 others. 234 (14%) respondents were male. Median age was 35 (IQR 28-44).

Main outcome measures

The Moral Distress Scale (Revised) (MDS-R) was used to look at moral distress, the abbreviated Maslach Burnout Inventory (aMBI) to examine the depersonalisation (DP) and emotional exhaustion (EE) domains of burnout, and the Trauma Screening Questionnaire (TSQ) to assess risk of PTSD.

Results

435/1194 (36%) nurses, 48/270 (18%) physicians and 19/192 (10%) other staff scored above the study threshold for moral distress (≥ 90 on MDS-R) (Chi-square test, $p < 0.00001$). 594/1194 (50%) nurses, 99/270 (37%) physicians and 86/192 (45%) other staff had high burnout scores (Chi-square test, $p = 0.0004$). 366/1194 (31%) nurses, 42/270 (16%) physicians and 21/192 (11%) other staff scored at risk for PTSD (Chi-square test, $p < 0.00001$). Junior nurses were at highest risk of moral distress and PTSD, and junior doctors of burnout. Larger unit size was associated with higher MDS-R, burnout and TSQ scores.

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3 **Conclusions**
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5 These results suggest that UK PICU staff are experiencing work-related distress. Further
6 studies are needed to understand causation and to develop strategies for prevention and
7 treatment.
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12 **Keywords**
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14 Intensive care; paediatric staffing; burnout; post traumatic stress; moral distress
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Introduction

Paediatric intensive care is a difficult environment in which to work. Staff need skills to manage both acute critical illness and palliative care at the end of life. Paediatric Intensive Care Unit (PICU) admissions in the UK are rising above levels expected from the growing population [1]. More and more patients have life-limiting conditions and multiple PICU admissions prior to death [2,3]. Recently, some cases have attracted high profile scrutiny in the Courts and on social media. As a result of these factors, the emotional costs of working in PICU are recognised as making it one of the most challenging in healthcare [4].

In the US, there has been increasing awareness of staff mental health in intensive care settings, and its impact on patient care. This has led to the Joint Critical Care Societies' statement on professional burnout, which recognises a need for more staff support and research [5]. In the UK, paediatricians represent around 5% of referrals to the NHS Practitioner Health Programme (PHP), a confidential mental health and addiction service for doctors, an over-representation compared with other specialties. Neonatologists and intensive care specialists form a significant subset of the paediatricians [6]. While strategies to support the workforce have been identified, the evidence base for interventions is scant, and provision is patchy and varies from unit to unit.

Overall prevalence of work related psychological distress in PICU staff is unknown though a survey in one UK PICU has shown high levels of burnout and PTSD [7]. Significant moral distress has been reported in adult ICU staff in the UK [8]; in a single site North American mixed P/NICU staff cohort [9]; and in a UK PICU following a recent high-profile case [10].

The aim of this study was to assess the prevalence of moral distress, burnout and post-traumatic stress in staff working in UK PICUs and in PICU transport teams.

Methods

Moral distress is felt when there is a discrepancy between a health professional's moral judgement about best treatment for a patient and the treatment they receive [11]. It was assessed in this study by the Moral Distress Scale- Revised (MDS-R) [12]. This comprises

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3 21 items; six about end of life care; five about staffing and resources; four about
4 communication; four items on decision making and two on witnessing unethical behaviour.
5 Respondents rate each item in terms of frequency and intensity of subjective disturbance.
6 Overall scores range from 0 to 336. The MDS-R also contains a final section on the
7 respondent's attitude to the idea of leaving their position as a result of moral distress. The
8 scale has been shown to have good content validity and reliability (Cronbach's alpha 0.84
9 to 0.90) across a number of different samples [9,13]. There are no specific 'cut-off' values
10 but as previous work has shown a score of 90 or above identifies individuals with a
11 significant level of distress [14], we used 90 as the threshold to indicate significant distress
12 on this dimension in this study.
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23 Burnout is a widely recognised but poorly defined manifestation of occupational stress [5],
24 associated with medical error, depression and suicide [15]. It is most often assessed using
25 the Maslach Burnout Inventory (MBI) [16]. In our study we used shortened 9-item version
26 of the original MBI, known as the abbreviated MBI (aMBI) [17], which has been found to
27 retain the factor structure of the original instrument [18]. Scores on aMBI were prorated
28 using full scale cutoffs of ≥ 27 for high emotional exhaustion (EE) and ≥ 10 for high
29 depersonalisation (DP) [16]. Following the methodology of a recent landmark
30 epidemiological study on physicians in the United States [19], burnout was defined as a
31 threshold of a top tercile score in either the aMBI-EE subscale ($\geq 9/18$) or the aMBI-DP
32 subscale ($\geq 6/18$).
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42 Post-traumatic stress disorder (PTSD) occurs in response to a traumatic event and
43 manifests as hyper-arousal, re-experiencing events in memories or nightmares, avoidance
44 of similar situations and generalised negative feelings or beliefs [20]. Risk of PTSD was
45 assessed using the Trauma Screening Questionnaire [TSQ] [21]. This is used to identify the
46 number of posttraumatic stress symptoms an individual has experienced in the previous
47 two weeks, in relation to a particular event (here defined as "stressful incident at work").
48 Scores range from 0-10 with a score of ≥ 6 indicating increased risk of PTSD. The TSQ has
49 been demonstrated to have an overall test efficiency of 90% (sensitivity of 0.85 and
50 specificity of 0.89) in identifying PTSD following assault [22]; this was the threshold we
51 used.
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3 Eligible staff were those employed by any participating site and working in any capacity in
4 PICUs or transport teams. Twenty-nine UK PICUs, 17 general units, 8 “mixed” (cardiac and
5 general) units, 4 cardiac intensive care units, and 10 centralised PICU transport teams took
6 part. Staff were invited via email and local study posters to complete anonymous online
7 questionnaires using Qualtrics LLC™ over a 6-week period May-June 2018. Information
8 collected included professional role, length of service and unit. There was an opportunity
9 for participants to leave free text comments. Signposting to psychological support services
10 was provided for staff who sought help after they had completed the survey.
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19 Univariate and multivariate analyses were performed to identify risk factors using Stata
20 version 14 (StataCorp, USA). Risk factors studied were respondents’ years in service, age,
21 gender, grade [consultant, junior doctor, senior nurse, junior nurse, other], primary
22 working environment (cardiac, general or mixed unit (cardiac and general), or transport)
23 and unit size divided into quartiles for average bed occupancy (1st quartile: 2-9; 2nd
24 quartile: 10-12; 3rd quartile: 13-15 and 4th quartile: 16-28). In multivariate analysis the
25 senior nurse group included advanced nurse practitioners (ANPs) and senior nurses.
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33 The electronic survey was designed so that it was not possible for respondents to move
34 from one section to the next without answering all questions. Surveys which were marked
35 complete but had incomplete data when the study closed (n=2) were excluded from data
36 analysis. Qualitative free text responses were analysed thematically [23] whereby key
37 themes were identified in responses to each free text question. Informed by the constant
38 comparative approach [24], the aim was to provide insight into respondents’ views and
39 recommendations (e.g. topics for future work). NVivo V.10 software was used to assist the
40 organisation and coding of data.
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49 The study was registered with the HRA and received research ethics committee approval
50 (IRAS: 218720, HRA REC: 17/HRA/0192).
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54 **Results**

55 **Respondents**

56 A total of 1656/3775 (44%) staff from 27/29 PICUs and 10/10 PICU transport services
57 completed the survey. Mean unit bed occupancy ranged from 2 to 28 patients [25].
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3 Respondents were 1194 nurses, 270 physicians and 192 other members of staff. Among
4 nursing staff, 940 were classified as “junior” (Band 6 and below), 254 as “senior” (Band 7
5 and above) of whom 57 were ANPs. Among medical staff, 166 were consultant grade and
6 104 were in training grades – 42 senior trainees (ST7 or above), 60 junior trainees (ST6 or
7 below) and 2 unclassified (no response). The “other” group included 65 physiotherapists,
8 21 pharmacists, 19 dieticians, 9 HCAs and 75 others (psychologists, speech and language
9 therapists, occupational therapists, play therapists, ambulance technicians, physician
10 associates, medical device technicians, clerical staff and housekeeping staff).

19 **Descriptive analysis**

20 234 (14%) respondents were male. Median age was 35 (IQR 28-44) (see Figure 1) and
21 median number of years in service on PICU was 6 years (IQR 2-14). Overall, 502/1656
22 (30%) reported a significant level of moral distress (≥ 90 for MDS-R), 779 (47%) scored in
23 high range for burnout ($\geq 6/18$ on aMBI-DP subscale or $\geq 9/18$ on aMBI-EE subscale) and
24 429 (26%) scored at risk of developing PTSD (≥ 6 on TSQ scale). There was significant
25 overlap across the various domains, with many staff scoring positively for more than one
26 measure (Figure 2).

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28 Overall 645 respondents (39%) had considered leaving PICU at some point, and 370 (22%)
29 were considering leaving when the survey was taken. 394 (24%) reported that they had
30 previously sought support for psychological issues, often using more than one source of
31 support; 209 from a friend or family member, 191 from their GP, 134 from their employer
32 occupational health service, 163 from a senior work colleague, 93 from a work colleague of
33 similar seniority and 70 from another professional (e.g. counsellor, staff support worker,
34 clinical psychologist).

49 **Univariate comparisons by professional group**

50 Nurses had a higher mean MDS-R, aMBI-EE and TSQ score than physicians and others but
51 physicians reported highest aMBI-DP mean scores (Table 1). MDS-R score ≥ 90 was
52 reported by 435/1194 (36%) nurses, 48/270 (18%) physicians and 19/192 others (10%)
53 (chi-square test, $p < 0.00001$). A high burnout score was reported by 594/1194 (50%)
54 nurses, 99/270 (37%) physicians and 86/192 (45%) others (chi-square test, $p = 0.0004$).

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3 Those scoring at risk for PTSD were 366/1194 (31%) nurses, 42/270 (16%) physicians
4 and 21/192 (11%) others (chi-square test, $p < 0.00001$).
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8 **Regression analyses**

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10 All staff groups were at higher risk of burnout when compared to consultants, with junior
11 doctors at highest risk. Nurses, whether junior or senior, were at higher risk of PTSD.
12 Junior nurses were at higher risk of moral distress. Male gender was associated with lower
13 risk of moral distress. Larger unit size was associated with high MDS-R, burnout and TSQ
14 scores, although unit type was not. Findings in relation to age and years in service were
15 seemingly at odds, with increasing age being associated with a lower risk of moral distress
16 and burnout but numbers of years in service in PICU associated with both (Table 2).
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24 Logistic regression analyses showed that “considering leaving now” was associated with
25 being a junior nurse (compared to consultants, OR 2.5 95%CI 1.4-4.6, $p = 0.002$) and
26 working in a larger unit (4th quartile for unit size compared to 1st quartile, OR 1.7, 95% CI
27 1.1-2.7, $p = 0.014$). The only significant risk factor for “sought help” was years in service (for
28 every year in service, OR 1.03, 95% 1.00-1.06, $p = 0.03$); data not shown.
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35 **Qualitative analysis of free text comments**

36 At the end of the questionnaire participants' comments were sought on content of the
37 questionnaire and topics to explore in future work. Just over a third 588/1656 (36%) of
38 participants provided a response; of these 98/588 (17%) suggested topics for future
39 research. Some comments suggested that staff found completing the questionnaire
40 challenging as it raised issues often “*considered 'taboo' subjects in my work environment*”
41 (P305).
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49 Thirty-eight topics were identified (Table 3). Thirty participants thought support for PICU
50 staff is insufficient and suggested tailored psychological support. Many highlighted
51 insufficient staffing levels and capacity. Work patterns, poor relationships with colleagues
52 and low pay were also described as having a negative impact. Staff suggested that future
53 work should explore the impact of challenging relationships with families, withdrawal of
54 treatment and child death upon staff psychological wellbeing, and the exacerbation of staff
55 distress by negative media coverage. Five participants commented on moral distress
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3 caused by providing “*futile care*” (P174), which may not be “*what is best for the patient*”
4 (P614), and difficulty caused by “*unrealistic expectations of society about what we can do for*
5 *some children*” (P367).
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10 In terms of possible solutions, seven staff suggested education and training, whilst three
11 stated that leaving PICU, or reducing clinical work, had been effective in reducing work
12 related stress. In contrast, a few participants provided positive comments about the value
13 of working in teams in which they can “*communicate openly*” (P18), “*express distress and*
14 *...readily access help in debriefing after horrible events*” (P17).
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21 Discussion

22 Those working in critical care recognise that stress impacts upon both personal wellbeing
23 and patient care; a recent research prioritisation exercise by the UK Paediatric Intensive
24 Care Society identified staff mental health and stress as the most important topic in need of
25 research [Tume LN, personal communication. Oral presentation at PICS, Bristol UK, 2018].
26 Our results, from the largest survey of PICU staff to date, confirm this, showing significant
27 rates of moral distress, burnout and risk of post-traumatic stress. The findings were
28 broadly consistent with the literature in that female gender, nursing background and
29 inexperience were associated with increased risk [8,9,13,14,26].
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40 There was no clear association with *type* of unit, although staff working on the largest units
41 were at increased risk of high levels of moral distress, emotional exhaustion and post-
42 traumatic stress disorder, with junior nurses in particular considering leaving their posts.
43 The findings suggest that there may be an optimal size of unit in terms of staff wellbeing.
44 Of note, “transport service” as a unit type was omitted from the model due to collinearity;
45 likely due to the higher proportion of older and male staff members in transport teams,
46 both associated with a lower risk of psychological morbidity (Table 2).
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54 **Moral distress:** The mean score of 69 for the sample on MDS-R was comparable to that
55 reported in adult intensive care staff in the UK (n=171) [8], a mixed group of health
56 professionals in the US (n=592) [13], and paediatric/neonatal intensive care staff in Canada
57 (n=2822) [14], but lower than that reported in two single site PICU studies in Canada
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3 (mean=102, n=206) [9] and the UK (mean=96, n=50) [10]. These single site studies were
4 at large tertiary centres consistent with our finding that staff in larger units reported
5 higher levels of moral distress. The main reason cited for moral distress related to
6 perceived futile treatment at the end of life [8,13]. The finding that 22% of staff were
7 considering leaving their job because of moral distress is concerning and is higher than
8 rates previously reported (7-20%) [8,12,13].
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15 **Burnout:** Overall prevalence of burnout among respondents was 47%. This is higher than
16 that reported in a recent survey of intensive care staff in the UK, which utilised the same
17 tool (32% for adult ICU staff; 42% for paediatric ICU staff) [27]. It is also higher than the
18 prevalence found in US physicians from across all specialties (32%-42%) and the US
19 general population (28%) [19]. A more recent US study in paediatric ICU physicians
20 identified a prevalence of burnout of around 20% [28], though a different tool was used to
21 assess burnout. Though we have used a validated measure, this highlights one of many
22 problems with burnout research – different instruments, different cutoffs [29], and even
23 the notion that the very act of measuring burnout might cause symptoms [30].
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33 **Post-traumatic stress:** 26% of all respondents and 31% of nurses scored above a
34 recognised clinical cut-off on the screening tool which assesses risk of PTSD. These rates
35 are at the upper end of those found in other studies of intensive care staff (17%-38.5%)
36 [31] and much higher than the general population (7%) [32].
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42 **Implications for Intervention Development:** Recent work has emphasised the
43 importance of interventions for burnout at both individual and organisational level [15].
44 The qualitative comments in this study support this, suggesting individual psychological
45 support, interventions to facilitate communication within teams and to address systemic
46 problems such as low staffing levels, shift patterns and low pay for nurses. For post-
47 traumatic stress there are established treatments available [33]. Recent work has also
48 focused on the possibility of “post-traumatic growth” [34] in PICU staff; the notion that
49 individuals can have positive effects resulting from stressful events [35]. Thus, it may be
50 important when designing interventions to also look at factors associated with resilience
51 and well-being.
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3 **Strengths:** Strengths of the study include the size of sample; participation of every
4 paediatric intensive care unit in the country; inclusion of allied health professionals and
5 other ancillary staff; examination of three different forms of staff stress; individual
6 qualitative comments; and anonymisation. The study design was also a strength, in that the
7 survey was set up in such a way that it was only possible to move on to a new page if all
8 previous items were complete; this meant that there was almost no missing data, which is
9 unusual for a study of this size.
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17 **Weaknesses:** The results may not be representative of all staff working in PICU; however,
18 the response rate was higher than in other online surveys of this type [36]. Respondents
19 were informed that one of the elements the survey was looking at was burnout; whereas
20 ideally respondents to the MBI should be unaware that it is a burnout measure to prevent
21 sensitisation to the “general issue of burnout” [16]. Short-form self-report questionnaires
22 were used to reduce the burden on participants but cannot be regarded as diagnostic.
23 Despite this, there are a number of studies which demonstrate the validity of abbreviated
24 measures in this field [18,19] and the PTSD screening instrument used has been
25 recommended as a robust measure in terms of its association with a gold standard clinical
26 interview in a recent review [37].
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37 **Conclusions**

38 All staff groups working on PICU, especially nurses, are at risk. Junior nurses are at highest
39 risk of moral distress, and junior doctors of burnout. Mean unit occupancy > 15 patients is
40 a risk factor for all types of psychological morbidity measured in this study. Participants in
41 our study identified contributory factors, as well as possible solutions, to psychological
42 distress, in qualitative free text responses. Further work, focusing on staff who feel fulfilled
43 and happy in their work, may help to determine individual and institutional factors
44 associated with resilience and wellbeing, though understanding these may not necessarily
45 help staff members who have serious psychological problems. Prospective studies are
46 required to determine which interventions, if any, may be helpful to prevent and to treat
47 psychological morbidity in PICU staff. This is vital for staff recruitment and retention and
48 most importantly, for good patient care.
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Confidential: For Review Only

What is already known on this topic

- Staff working in intensive care are at risk of psychological morbidity, impacting on staff wellbeing and mental health, staff retention and patient care.
- The prevalence of burnout, moral distress and post-traumatic stress has not been assessed before in a national UK PICU staff survey.

What this study adds

- UK PICU staff are experiencing work related distress; junior nurses are at the highest risk of moral distress and PTSD symptoms, and junior doctors of burnout.
- Mean unit occupancy > 15 patients is a risk factor for work-related distress.
- Free text comments provided by participants suggest potential strategies for treatment and prevention.

Tables

Table 1. Univariate comparison by staff group (n=1656)

| | Nurses (1) | Doctors (2) | Others (3) | p | Test |
|-------------------------------|-------------|-------------|-------------|--------|----------------|
| N | 1194 | 270 | 192 | | |
| Age, median IQR | 33 (27, 43) | 40 (35, 36) | 37 (30, 46) | <0.001 | Kruskal Wallis |
| Years in service, median, IQR | 6 (2, 15) | 5 (1, 12) | 4 (2, 10) | <0.001 | Kruskal Wallis |
| Gender - male (%) | 63 (5%) | 133 (49.3%) | 38 (19.8%) | <0.001 | Chi square |
| Considering leaving now | 299 (25%) | 34 (12.6%) | 37 (19.3%) | <0.001 | Chi square |
| Sought help | 306 (25.6%) | 51 (18.9%) | 37 (19.3%) | 0.019 | Chi square |
| MDS-R, mean (SD) | 77 (40) | 56 (33) | 36 (33) | <0.001 | ANOVA |
| aMBI-DP, mean (SD) | 2.7 (3) | 3.6 (3.5) | 2.6 (3.2) | 0.017 | ANOVA |
| aMBI-EE, mean (SD) | 8.2 (4.1) | 6.5 (4.2) | 7.4 (4.5) | <0.001 | ANOVA |
| TSQ, mean (SD) | 4 (2.9) | 2.6 (2.7) | 2.6 (2.5) | <0.001 | ANOVA |

Table 2. Logistic regression showing factors related to staff distress (n=1656)

| | Moral Distress ^a | Burnout: Depersonalisation OR EE above threshold | Post-traumatic stress ^d |
|---|-----------------------------|--|------------------------------------|
| Years in service (per year) | 1.05 (1.02-1.08)** | 1.03 (1.00-1.05)* | 1.01 (0.98 – 1.03) |
| Age in years (per year) | 0.97 (0.95-0.99)* | 0.95 (0.93-0.96)** | 0.98 (0.96 – 1.01) |
| Male gender (compared to female) | 0.62 (0.4-0.97) * | 1.14 (0.79-1.64) | 0.91 (0.59 – 1.41) |
| Unit type^e Cardiac (<i>reference</i>) | | | |
| Mixed | 0.84 (0.55-1.27) | 0.94 (0.63-1.38) | 0.83 (0.54 – 1.27) |
| General | 1.18 (0.76-1.83) | 1.07 (0.72-1.59) | 1.04 (0.67 – 1.62) |
| Grade Consultant (<i>reference</i>) | | | |
| Junior doctor | 1.04 (0.51-2.11) | 2.69 (1.49-4.8)** | 1.42 (0.67 – 3) |
| Senior nurse (incl ANP) | 1.54 (0.88-2.71) | 2.17 (1.29 – 3.67)** | 2.66 (1.42 – 5.00) ** |
| Junior nurse | 1.92 (1.13-3.24)* | 2.09 (1.30 – 3.37)** | 2.86 (1.59 – 5.17)** |
| Other | 0.44 (0.22 – 0.87)* | 2.25 (1.34 – 3.77)** | 0.81 (0.35 – 1.86) |
| Unit size (quartiles) 2-9 beds (<i>reference</i>) | | | |
| 10-12 beds | 1.13 (0.79-1.62) | 1.31 (0.95-1.79) | 1.28 (0.89 – 1.83) |
| 13-15 beds | 2.05 (1.35-3.11)** | 1.36 (0.92 – 2.00) | 1.06 (0.68 – 1.66) |
| 16-28 beds | 2.45 (1.61-3.74) ** | 2.00 (1.36 – 2.93)** | 1.72 (1.12 – 2.65) * |

^a assessed using the Moral Distress Scale-Revised ≥ 90 ; ^b assessed using the abbreviated Maslach Burnout Inventory Depersonalisation subscale ≥ 6 (equivalent to ≥ 10 on full MBI); ^c or the abbreviated Maslach Burnout Inventory Emotional Exhaustion subscale ≥ 9 (equivalent to ≥ 27 on the full MBI); ^d assessed using the Trauma Screening Questionnaire ≥ 6 ; ^eTransport unit omitted from models due to collinearity with older age and male gender (see Discussion).

* $p < 0.05$ ** $p < 0.01$

Table 3. Qualitative analysis of free text comments. Topics identified as important to explore in future research on the psychological impact of working in Paediatric Critical Care (n=98)

| Topic (number of participants who described this topic) | Example quotation |
|---|--|
| Tailored support for PICU staff (30) | <p>"We all need support and advice tailored to the same to ensure we do not 'burn out' working at such an intense fast pace" (P24)</p> <p>"Not enough continued support to staff, expected to get over things and if not seen as not coping with feelings and emotions" (P400)</p> |
| Staffing levels and capacity (17) | <p>"Yes I do get burnt out it's not the children it's the staffing levels endless paperwork and the fear of making mistakes" (P703).</p> <p>"I think the questionnaire did not ask about the effect of chronic lack of capacity where most days there is a struggle to admit and discharge patients, leaving you feel chronically as if you are not able to provide the service you aspire to" (P66).</p> |
| Staff relationships and bullying (15) | <p>"My worst experiences have been with other nurses--feeling insulted and bullied by senior staff nurses has left me wanting to quit more than any issues with patients/families" (P907).</p> <p>"A lot on moral dilemmas not a lot on emotional feelings re working conditions, working alongside difficult team members, that can cause burnout in my opinion in a hierarchical setting. When you have worked on a unit as long as I have then it's not the patients that stress you out but some of the staff! Personality issues, poor leadership issues etc" (P1591)</p> |
| Impact upon family and social life (14) | <p>"Questions on your relationships with friend and family. these can be adversely affected by pressures at work" (P422).</p> <p>"How the job effects your personal life , your relationship with partner family, friends" (P822).</p> |
| Impact of working patterns (13) | <p>"But it's not the clinical side that does it - it's the long shifts" (P583).</p> <p>"More questions about work patterns...working on a 1 in 3 rota is tough and means some months there are only 4 days a month where I'm not physically in work. Whereas on the other side, some nurses can do 4 12/13 hour shifts in a 5 day period. I think that may have an effect" (P4).</p> |
| Challenging relationships with families (8) | <p>"Nowhere is the behaviour of families included and I think that has a major effect on how staff cope" (P596)</p> <p>"More questions about interactions with families, this can be a massive source of stress and anxiety" (P1445).</p> |
| Demoralised, under paid and undervalued staff (7) | <p>"The psychology of feeling completely dispensable, e.g being sent to the wards as soon as we have 1 nurse free. This makes us feel undervalued and unable to recover from the relentless pressure within critical care. We need a higher wage for being</p> |

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| | <p><i>dispensable and the skills/risk/burn out we are exposed to, this might actually help with attracting staff and retaining staff" (P1164).</i></p> <p><i>"Topics asking about daily struggles at work due to lack of recognition financially or from the trust" (P745).</i></p> |
| Education and training (7) | <p><i>"Education support and learning packages" (P502).</i></p> <p><i>"Having patients above your skill set and no support" (P196).</i></p> |
| Patient death and decisions about withdrawal of care (6) | <p><i>"Patient withdrawal should be included and patient death" (P794).</i></p> <p><i>"I think it could have gone into more depth regarding patients who are withdrawn from life support and the upsetting process surrounding this matter, especially considering recent highly publicised cases in the media" (P621).</i></p> |
| Impact of the media (including social media) (6) | <p><i>"The greatest issue I have with PICU at present is society's expectations of what we do... In my opinion recent cases in the media have shown we are treating parents and being vilified in social media at the detriment of the child and doing all in the face of futility is the most disheartening aspect of the job" (P614).</i></p> <p><i>"The effect social media/the press have and the distress they cause staff" (P186).</i></p> |
| Managerial pressures (3) | <p><i>"Would have been good to have a question about management" (P941)</i></p> <p><i>"Questions about management pressures" (P7)</i></p> |

Figures

Figure 1:

Histogram showing age distribution of respondents to the survey. *y axis* – n [respondents], *x axis* - age banding.

Figure 2:

Overlap between the various measures of psychological morbidity: Figure illustrates extent and overlap of high scoring staff for each of the three types of work-related distress surveyed (n=1656)

Moral distress defined as Moral Distress Scale-Revised ≥ 90 ; Burnout defined as a high score on the abbreviated Maslach Burnout Inventory for emotional exhaustion (subscale ≥ 9 , equivalent to ≥ 27 on the full MBI) and/or depersonalisation (subscale ≥ 6 , equivalent to ≥ 10 on the full MBI); Post Traumatic Stress defined as Trauma Screening Questionnaire ≥ 6 .

References

1. Davis P, Stutchfield C, Evans T et al: Increasing admissions to paediatric intensive care units in England and Wales: more than just rising a birth rate. *Arch Dis Child* 2018; 103: 341-345.
2. Plunkett A, Parslow RC: Is it taking longer to die in paediatric intensive care in England and Wales? *Arch Dis Child*. 2016;101:798-802.
3. Fraser LK, Miller M, Hain R et al: Rising national prevalence of life-limiting conditions in children in England. *Pediatrics* 2012; 129:e923-9.
4. Kirsch RE, Balit CR, Carnevale FA et al. Ethical, cultural, social, and individual considerations prior to transition to limitation or withdrawal of life-sustaining therapies. *Ped Crit Care Med* 2018;19:S10–S18.
5. Moss M, Good V, Gozal D et al: An official critical care societies collaborative statement: burnout syndrome in critical care healthcare professionals: a call for action. *Crit Care Med* 2016;44:1414-21
6. Cass H, Barclay S, Gerada C, et al Complexity and challenge in paediatrics: a roadmap for supporting clinical staff and families *Archives of Disease in Childhood* Published Online First: 11 June 2019. doi: 10.1136/archdischild-2018-315818
7. Colville G, Dalia C, Brierley J et al. Burnout and traumatic stress in staff working in paediatric intensive care: associations with resilience and coping strategies. *Intensive Care Med* 2015;41:364-5
8. Colville GA, Dawson D and Rabinthiran S. A survey of moral distress in staff working in intensive care in the UK. *J Intensive Care Society* 2019;20:196-203
9. Larson CP, Dryden-Palmer KD, Gibbons C et al. Moral distress in PICU and neonatal ICU practitioners: a cross-sectional evaluation. *Ped Crit Care Med* 2018;18:e318-e326.

10. Colville G, Rutt M, Berger Z, et al. Moral distress, trauma and burnout in staff in relation to changes in PICU outcomes, challenging cases and media involvement in disagreements about end-of-life care. *Arch Dis Child* 2018;103:A192-A193
11. Corley MC. Moral distress of critical care nurses. *Am J Crit Care* 1995;4:280 –285
12. Hamric AB, Borchers CT, Epstein E. Development and testing of an instrument to measure moral distress in healthcare professionals; *AJOB Prim Res* 2012;3:1–9.
13. Whitehead PB, Herbertson RK, Hamric AB et al. Moral distress among healthcare professionals: report of an institution-wide survey. *J Nurs Scholarsh* 2015;47:117-25
14. Dryden-Palmer K, McNeill C, Moore G et al. Moral distress in Canadian paediatric and neonatal ICU; a national survey. *Pediatr Crit Care Med* 2018;19;6S 148
15. West CP, Dyrbye LN, Erwin PJ et al. Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis *Lancet* 2016;388:2272–81
16. Maslach C, Jackson S, Leiter M. *Maslach Burnout Inventory Manual*. 3rd ed. Palo Alto, CA, USA: Consulting Psychologists Press; 1996
17. McManus IC, Winder BC, Gordon D. The causal links between stress and burnout in a longitudinal study of UK doctors. *Lancet* 2002;359:2089–90
18. Riley MR, Mohr DC, Waddimba AC. The reliability and validity of three-item screening measures for burnout: Evidence from group-employed health care practitioners in upstate New York. *Stress Health* 2018;34:187-193.
19. Shanafelt TD, Hasan O, Dyrbye LN et al. Changes in burnout and satisfaction with work-life balance in physicians and the general us working population between 2011 and 2014. *Mayo Clin Proc* 2015;90:1600-13.
20. American Psychiatric Association *Diagnostic and statistical manual of mental disorders: DSM-5 (5th ed.)*, American Psychiatric Publishing, Washington DC, USA; 2013
21. Brewin CR, Rose S, Andrews B et al. Brief screening instrument for post-traumatic

1
2
3 stress disorder. *Br J Psych* 2002;181:158-162.
4
5

6 22. Walters JT, Bisson JI, Shepherd JP. Predicting post-traumatic stress disorder:
7 validation of the Trauma Screening Questionnaire in victims of assault. *Psychol Med*
8 2007;37:143-50.
9
10

11
12 23. Braun V and Clarke V. Using thematic analysis in psychology, *Qual Res Psych*
13 2006;3:77-101
14
15

16
17 24. Glaser B: The Constant Comparative Method of Qualitative Analysis. *Social Problems*
18 1965;12:436-445.
19
20

21
22 25. Paediatric Intensive Care Audit Network Annual Report 2017 (published November
23 2017): Universities of Leeds and Leicester.
24
25

26
27 26. Dodek PM, Wong H, Norena M et al. Moral distress in intensive care unit professionals
28 is associated with profession, age, and years of experience. *J Crit Care* 2016;31:178-82.
29
30

31
32 27. Colville GA, Smith JG, Brierley J et al. Coping with staff burnout and work-related
33 posttraumatic stress in intensive care. *Pediatr Crit Care Med* 2017;18:e267-e273
34
35

36
37 28. Gribben JL, Kase SM, Waldman ED et al. A cross-sectional analysis of compassion
38 fatigue, burnout, and compassion satisfaction in pediatric critical care physicians in the
39 United States. *Pediatr Crit Care Med* 2019;20:213-222.
40
41

42
43 29. Mariscalco MM. Are we "burned out" or just "burned" ...on burnout research? *Pediatr*
44 *Crit Care Med* 2019;20:290-291.
45
46

47
48 30. Eckleberry-Hunt J, Kirkpatrick H, Barbera T. The problems with burnout research
49 *Acad Med* 2018;93:367-370.
50
51

52
53 31. van Mol MM, Kompanje EJ, Benoit DD et al. The prevalence of compassion fatigue and
54 burnout among healthcare professionals in intensive care units: a systematic review. *PLoS*
55 *One* 2015;10:e0136955.
56
57

58
59 32. Kessler RC, Wang PS. The descriptive epidemiology of commonly occurring mental
60 disorders in the United States. *Ann Rev Public Health* 2008;29:115-129

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60
33. National Institute for Health Excellence. The management of PTSD in adults and children in primary and secondary care. NICE Clinical Guideline 116. Manchester: National Institute for Health and Care Excellence, 2018 <https://www.nice.org.uk/guidance/ng116> (accessed 13 January 2019)
34. Rodríguez-Rey R, Palacios A, Alonso-Tapia J et al. Are pediatric critical personnel satisfied with their lives? Prediction of satisfaction with life from burnout, posttraumatic stress, and posttraumatic growth, and comparison with noncritical pediatric staff. *Pediatr Crit Care Med* 2019;20:e160-e169.
35. Park CL, Helgeson VS. Introduction to the special section: growth following highly stressful life events--current status and future directions. *J Consult Clin Psychol* 2006;74:791-6.
36. Watt S, Simpson C, McKillop C et al. Electronic course surveys: does automating feedback and reporting give better results? *Assess Eval Higher Education* 2002;27:325-337.
37. Mouthaan JT, Sijbrandif M, Reitsma JB, et al: Comparing screening instruments to predict posttraumatic stress disorder. *PLoS One* 2014;9:e97183

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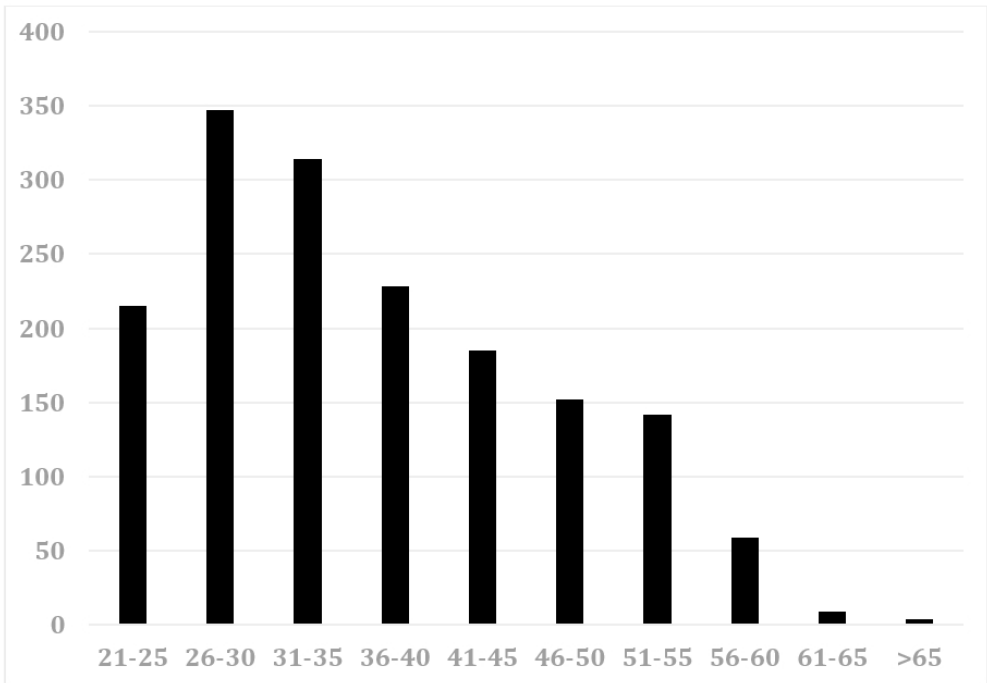


Figure 1.

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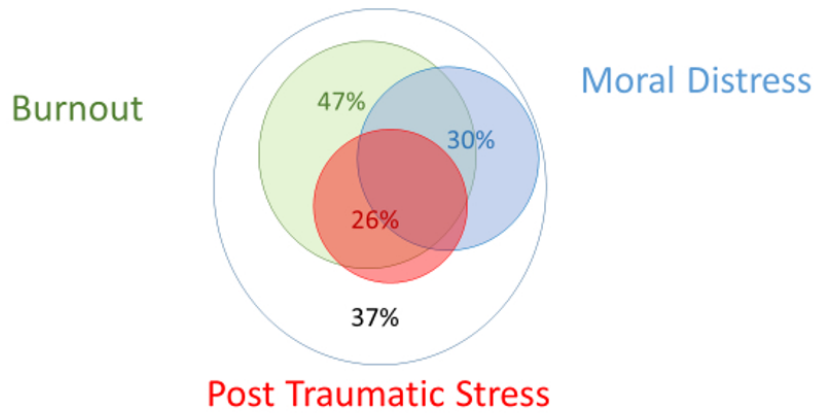


Figure 2.

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