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Examining the sources of occupational stress in an emergency department

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Background	Previous work has established that health care staff, in particular emergency department (ED) personnel, experience significant occupational stress but the underlying stressors have not been well quantified. Such data inform interventions that can reduce cases of occupational mental illness, burnout, staff turnover and early retirement associated with cumulative stress.
Aims	To develop, implement and evaluate a questionnaire examining the origins of occupational stress in the ED.
Methods	A questionnaire co-designed by an occupational health practitioner and ED management administered to nursing, medical and support staff in the ED of a large English teaching hospital in 2015. The questionnaire assessed participants' demographic characteristics and perceptions of stress across three dimensions (demand–control–support, effort–reward and organizational justice). Work-related stressors in ED staff were compared with those of an unmatched control group from the acute ear, nose and throat (ENT) and neurology directorate.
Results	A total of 104 (59%) ED staff returned questionnaires compared to 72 staff (67%) from the acute ENT/neurology directorate. The ED respondents indicated lower levels of job autonomy, management support and involvement in organizational change, but not work demand. High levels of effort–reward imbalance and organizational injustice were reported by both groups.
Conclusions	Our findings suggest that internal ED interventions to improve workers' job control, increase support from management and involvement in organizational change may reduce work stress. The high levels of effort–reward imbalance and organizational injustice reported by both groups may indicate that wider interventions beyond the ED are also needed to address these issues.
Key words	Emergency services; NHS workforce; occupational stress; perceived work stressors; stress; well-being; work place stress.

Introduction

Work-related stress is a significant international health and safety concern [1–3]. Cumulative stress has been linked to several adverse health effects, occupational outcomes and lifestyle behaviours, including early cardiovascular disease, mental illness, burnout, early retirement, substance misuse and sedentary lifestyles [4,5]. Three theoretical frameworks are thought to mediate stress-related ill-health linked to the work environment. These include the demand–control–support (DCS), effort–reward (ER) and organizational justice (OJ) models. In the DCS model, workers experiencing high demands, low levels of control and poor social support are thought to experience the lowest well-being. While the DCS model has been widely used in organizational psychology studies [6–8], more contemporary models in work psychology have suggested that ER imbalance and organizational injustice are significant modifiers of occupational well-being. In the ER model, rewards may be tangible, such as pay or promotions, or intangible, such as a sense of feeling valued by others [9]. OJ includes relational components concerned with the quality of interactions and procedural ones, such as the fairness of policies and how programmes are designed, implemented and evaluated in an organization [10]. Professions known to encounter high levels of occupational stress include teachers, fire and rescue personnel, police officers,

social workers, prison officers, agriculture workers and health care staff [11–14].

One group of workers at risk of encountering substantial occupational stress is emergency department (ED) personnel, with previous work demonstrating that this staff group encounters levels in excess of their hospital colleagues [15]. Some attention has been paid to the role of acute stressors such as violence, trauma, bereavement and post-traumatic stress [16,17]. The adverse health and occupational outcomes of exposure to chronic stress, such as psychological illness, burnout and early retirement, have also been examined [18,19]. There are fewer data, however, on the sources of occupational stress in this group, and to our knowledge very few studies have quantified these using established theoretical models of organizational stress [15]. Such information is essential in establishing which stressors are specific to the ED, are features of the hospital or health care facility or may be aspects of the wider health care system. Furthermore, these data underpin the development of successful stress reduction interventions.

Occupational health is well placed to support management in identifying sources of work-related stress and advising on interventions to address them. Accordingly the aim of this study was to develop, implement and evaluate a questionnaire examining the origins of occupational stress in the ED.

Methods

The study was cross-sectional and based in the ED of a large teaching hospital in the north of England. In mid-2014, C.Y. (an ED physician) and S.B. (an occupational physician) discussed concerns about rising levels of occupational stress in the ED, evidenced by increasing numbers of staff off-sick due to work-related mental illness or leaving the department to find alternative work, and anecdotal reports of job dissatisfaction. In response, a service evaluation was conducted using the Health and Safety Executive (HSE) Stress Indicator Tool [20]. Briefly, this 35-item questionnaire covers seven management standards identified by the HSE as contributors to work-related mental illness. These are job demands, job control, support from managers and peers, role clarity and work relationships and organizational change. A set of questions relate to each standard: for example, questions 2, 10, 15, 19, 25 and 30 assess aspects of job control. Responses are recorded on a five-point Likert Scale ranging from strongly disagree (1) to strongly agree (5), with a lower value indicating greater levels of perceived stress relating to that standard. To calculate the group arithmetic means for each of the seven standards, the mean score for each participant was first calculated. The sum of these values was then divided by the number of participants in the department or professional group. Scores can be compared to those of 136 other organizations previously surveyed using the tool by the HSE.

In our questionnaire, a free-text box for further comments related to work stress in the department was also included. Written comments were provided from many of the 125 questionnaire respondents (60% response rate), as well as verbal feedback from 67 staff members attending one of six focus groups led by S.B. and C.Y. following the pilot. The feedback indicated that the HSE tool had not captured all of the issues underlying work stress in the department. Although high work demand and loss of job control were cited particularly by clinical staff, many participants described a 'command-control' style of management as a source of stress. Others described feelings of being undervalued by senior staff, a sense of being undermined by colleagues, lack of clarity regarding promotion and progression practices and inadequate consultation regarding departmental changes.

In response to this feedback, a more detailed stress survey was conducted in 2015. In addition to the HSE questionnaire, the validated short version of the Effort–Reward and Over-Commitment scale (Cronbach's alpha >0.80 for all components) and Finnish Organisational Justice Scale (Cronbach's alpha >0.80 for both components) were included [21,22]. Effort, reward and over-commitment were measured using a four-point scale from strongly disagree (1) to strongly agree (4). As with the HSE tool, group mean scores for each stress variable (ER, over-commitment, procedural justice and relational justice) were calculated from the mean of individual participants' scores for the relevant questionnaire items, with these values subsequently averaged for the department or professional group [21]. A correction factor of 7/3 was applied to calculate ER ratios to reflect the unequal number of items assessing each factor. Relational and procedural justice was measured using an identical four-point scale. Mean scores, however, were calculated as an average score per question (Table 1) [23].

Demographic details including age, gender, health care occupation (doctor, nurse or support worker), length of time working in the ED and length of time working in health care were also collected. Age bands were set at the following intervals: <20, 20–39, 40–59 and ≥60. Data for health care experience were grouped into <4 years, between 5 and 10 years or ≥10 years. These intervals were set arbitrarily by the authors and took into consideration the wish to identify differences in questionnaire responses, without creating strata containing numbers of participants too small to do so.

A multivariate logistic regression analysis was conducted to assess the relationship between these demographic factors and participants' responses across the seven HSE domains, ER, over-commitment and OJ components of the questionnaire; 95% confidence intervals for grouped mean scores were calculated using the standard error of the mean to adjust for small sample sizes.

Finally, a Mann–Whitney *U*-test was performed to identify differences in responses between those completing the questionnaire within 2 weeks of administration and later responders. The rationale for this was the possibility that those ED staff perceiving the work environment as more stressful may be more motivated to take part in the study.

All clinical ED staff (medical, nursing and support) were invited to participate on a voluntary basis. Written copies of the questionnaire were placed in the personal mailbox of each staff member. Four sealed collection boxes were located across the department. S.B., C.Y. and senior members of the nursing team gave electronic and verbal reminders to complete the questionnaire on a weekly basis for the 6-week data collection period. No incentives were offered for participation. Questionnaire responses were collected at 2 and at 6 weeks after administration in the ED. To determine which stressors may be specific to the ED and which may be wider features of the hospital, an unmatched hospital control group of medical, nursing and support staff from the acute admissions unit of the ear, nose and throat (ENT)/neurology directorate completed the questionnaire over the same period as the ED staff. Data were analysed using Microsoft Excel and SPSS version 22.0. Ethical approval was granted by the local National Health Service Clinical Effectiveness Unit.

Results

A total of 104 (59%) clinical ED staff returned questionnaires, a response rate ranging from 48% among physicians to 77% among support staff. By gender the majority of responses were from females in the nursing group, with a near equal gender split for physicians and support workers. This broadly reflected the gender profile of the department at the time. ED nurse respondents were generally more experienced than other clinical staff both by years in the department and years in health care as a whole (Table 2).

Results from the logistic regression analyses showed no significant differences in participants' responses according to age, gender or years of experience for any section of the questionnaire. Similarly, there were no significant differences between responses from those who completed the questionnaire within the first 2 weeks of administration and those that completed it later.

The mean scores, along with 95% confidence intervals, for each ED profession pertaining to the seven HSE standards, effort-reward, over-commitment and justice sections of the questionnaire are shown in Table 3. Those values highlighted in bold indicate that the department lies in the worst quintile of results for that standard, as compared with organizations previously surveyed by the HSE. The table demonstrates that all ED staff groups perceived low levels of job control. Nurses and support workers also indicated high work demand, with nurses significantly more so than the surveyed physicians. ED nurses also indicated significantly higher levels of stress across a number of other HSE standards to include insufficient management support, poor interpersonal relationships and low involvement in organizational change. All groups demonstrated role clarity. ER imbalance was

Table 1. OJ questions

Relational justice	Procedural justice
Your supervisor considers your viewpoint.	Procedures are designed to hear the concerns of all those affected by the decision.
Your supervisor is able to suppress personal biases.	Procedures are designed to collect accurate information necessary for making decisions.
Your supervisor treats you with kindness and consideration.	Procedures are designed to provide opportunities to appeal or challenge the decision.
Your supervisor takes steps to deal with you in a truthful manner.	Procedures are designed to generate standards so that decisions can be made with consistency.

Table 2. ED and control group response rates and demographics

Job	Responses, *n* (% of department)	Female respondents, *n* (% of respondents)	Mean years in department (range)	Mean years in health care (range)
ED nurse	61 (58)	53 (87)	6 (<1–20)	13.5 (<1–30)
ED physician	20 (48)	11 (55)	1 (<1–15)	7 (2–24)
ED support worker	23 (77)	12 (52)	2 (1–25)	8 (1–35)
ENT nurse	45 (60)	38 (84)	5 (<1–11)	10 (<1–30)
ENT physician	10 (50)	4 (40)	3 (<1–8)	5 (<1–25)
ENT support worker	15 (75)	10 (67)	4 (<1–6)	5 (<1–26)

Table 3. Means and CIs of responses for HSE domains, ER, over-commitment and OJ components of questionnaires for ED health care groups

	ED nurses	ED physicians	ED support workers
Demand	**2.60 (2.49–2.71)**	2.97(2.76–3.08)	**2.83 (2.58–3.08)**
Control	**2.84 (2.77–2.91)**	**3.16 (3.00–3.32)**	**2.99 (2.82–3.16)**
Managers support	**3.06 (3.01–3.11)**	3.58 (3.46–3.70)	**3.11 (3.05–3.17)**
Peer support	3.63 (3.58–3.68)	4.00 (3.95–4.05)	3.90 (3.80–4.00)
Relationships	**3.43 (3.30–3.56)**	3.82 (3.65–3.99)	3.74 (3.51–3.97)
Role	4.19 (4.00–4.38)	4.39 (4.35–4.43)	4.45 (4.42–4.48)
Organizational change	**2.63 (2.59–2.67)**	2.98 (2.94–3.02)	3.29 (3.24–3.34)
ER ratio	1.36 (1.18–1.54)	1.08 (0.98–1.18)	1.28 (1.16–1.40)
Over-commitment	14.56 (13.89–15.23)	14.58 (13.52–15.64)	13.95 (12.68–15.22)
Relational justice	2.65 (2.50–2.80)	2.83 (2.62–3.04)	2.94 (2.78–3.10)
Procedural justice	2.37 (2.28–2.46)	2.60 (2.42–2.78)	2.75 (2.55–2.95)

Bold indicates a value in the worst quintile of results for that HSE management standard. CI, confidence interval.

observed across all groups, but less so among physicians. Organizational commitment, relational and procedural justice scores were broadly similar across staff groups.

Written feedback from participants once again predominantly related to concerns over loss of decision-making autonomy such as when to take breaks and judgments about patient care, a 'top–down' management culture and interpersonal difficulties with work colleagues both within and between professional groups. For example, support staff described pressure from both doctors and nurses in asking them to do tasks beyond the remit of their training. Nursing staff describe a sense of competition between teams in the department which had eroded the camaraderie once felt when the department functioned as a single unit.

A total of 75 clinical staff (10 doctors, 45 nurses, 15 support workers) participated from the ENT/neurology directorate, representing a response rate of 62%. Table 4 displays the results from both departments across all components of the questionnaire. Significant differences at the 95% confidence level are indicated by a superscript letter, with 95% confidence intervals shown in parentheses. The data suggest ED staff experience significantly lower levels of control over their work despite similarities in perceived work demand. ED staff also reported significantly lower levels of managerial support and involvement in organizational change than their ENT counterparts. There were no apparent differences in ER, commitment and perceptions of OJ between the two staff groups.

Table 4. Comparison of scores for HSE management standards, ER, over-commitment and OJ scores from ED and ENT departments

	ED	ENT/neurology
Demand	2.67 (2.54–2.80)	2.71 (2.50–2.92)
Control[a]	2.88 (2.80–2.96)	3.29 (3.16–3.42)
Managers support[a]	3.00 (2.94–3.06)	3.18 (3.08–3.28)
Peer support	3.71 (3.66–3.76)	3.73 (3.68–3.78)
Relationships	3.51 (3.46–3.66)	3.39 (3.06 -3.62)
Role	4.57 (4.53–4.61)	4.63 (4.56–4.70)
Organizational change[a]	2.98 (2.94–3.02)	3.11 (3.07–3.14)
ER ratio	1.34 (1.27–1.41)	1.35 (1.26–1.44)
Over-commitment	2.40 (2.28–2.52)	2.47 (2.35–2.59)
Relational justice	2.74 (2.62–2.86)	2.78 (2.66–2.90)
Procedural justice	2.47 (2.36–2.58)	2.69 (2.54–2.84)

[a]Statistically significant difference at 95% confidence interval level.

Discussion

This study demonstrates that in this ED, staff members experienced a range of occupational stressors that were distributed differently across professional groups. The ED is known to be a busy work environment and it is perhaps unsurprising that staff cited high work demand [16,17]. Further, many of the 136 organizations previously surveyed by the HSE include small- to medium-sized enterprises, as well as local and central government organizations that may not face the same day-to-day work intensity pressures which ED staff encounter. This may explain why the department ranked in the worst quintile of results for this standard.

Possibly more interesting, however, is that other factors such as low job autonomy, insufficient management support, low involvement in organizational change and perceptions of ER imbalance were significant occupational stressors particularly, but not exclusively, for ED nurses. The written questionnaire comments and verbal feedback provided to us through organized focus groups and anecdotally in discussions with staff members indicate that these work stressors may be important modifiers of job satisfaction and career decision making. We intend to explore this in a future study.

Our comparison with an internal hospital control group identified that ED staff perceived significantly lower levels of control, management support and involvement in organizational change than their ENT/neurology

counterparts. This could indicate that these factors may be amenable to ED-specific interventions. Accordingly since the end of the study, a group of senior ED clinicians, S.B. and a member of the hospital service improvement team have been tasked with co-designing a primary-level intervention programme to address these work factors specifically. Our approach will be very much guided by the contributions of staff but may include increasing lines of communication between management and staff, improving methods of discussing departmental changes and where possible increasing workers' control over their job such as developing more flexible rota patterns. This programme is running concurrently with measures to reduce work demand such as an increase in nursing staff and changes to frontline assessment processes in the ED.

It is unclear to what degree the levels of ER imbalance and organizational injustice reported by ED staff in this study can be generalized to other EDs or whether findings from a hospital's ED are indicative of those of the hospital as a whole. This latter distinction is important, since a broader approach may be needed to address these issues if they are common features of a hospital or health care system. The ER ratios returned from this study exceed those seen in many recent international studies of health care staff such as those conducted in China, Mongolia, Germany and France, with only Greek health care workers exceeding our values [24,25]. The mean over-commitment scores were similar to those of other European health care and public sector workers. A study of Spanish health care employees returned a mean score of 2.48 for male employees and 2.63 for female workers using an identical scale to this study [26]. A direct comparison of justice scores with previous work is challenging given differences in the types of scales used and questions asked. Relational justice scores, measured on a four-point scale identical to that used in this study, were constructed from responses of 10 308 British civil servants in the Whitehall II study. Mean scores were scaled from 25 to 100, returning a baseline value of 80.1 for both men and women [23]. If the same scale was applied to the results of this study, our value would be 68, indicating lower perceived justice in our group.

This study has some important limitations. We used a single site and a single control group from the hospital, limiting the generalizability of our findings. In particular, it is unclear to what degree our findings represent those of other EDs, or whether our results reflect those of other acute hospital units. Furthermore it is possible that some stressors are shared throughout the health care workforce. Such data is important in informing how and where best to target successful interventions. We did not assess the influence of occupational stress on workers' health or job satisfaction, which would have added further value to our work. Our control group was not matched for age, gender or years of experience. We also assumed cardinality of our responses when conducting our statistical analysis in that we supposed the probability of an individual scoring a question 1 out of 5 was equal to that of them scoring it 5 out of 5.

While previous work has indicated that ED staff experience a range of occupational stressors, to our knowledge, this is the first to quantify them in a systematic way. Our approach can be reproduced elsewhere to determine the types of primary-level interventions that can reduce work stress among staff, including how and where they should be delivered. Our work has indicated some limitations of the HSE Stress Indicator Tool in identifying sources of organizational stress in this group, and further work should determine whether this is a consistent problem. Similarly, a number of junior staff indicated difficulty understanding the wording of some questions relating to procedural justice. This may be due to more senior staff members having greater familiarity with hospital policies and processes. This will have influenced the utility of our scores and may be a consideration for future studies. Future studies should determine whether our findings can be generalized to other emergency health care settings such as ambulance and acute services, examine the association of stress with occupational and health outcomes such as job satisfaction and mental illness and evaluate the impact of interventions to reduce stress among this workforce.

Key points

- The emergency department is a demanding workplace but the occupational stressors affecting staff are not well defined.
- Emergency department staff reported lower job control, higher effort–reward imbalance and lower perceptions of organizational injustice than hospital colleagues.
- Internal interventions addressing these issues may reduce work stress in this emergency department.

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Conflicts of interest

None declared.

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