Effort–reward imbalance and burnout among humanitarian aid workers

Liza Jachens Research Associate and Lecturer, Psychology, Sociology and Professional Counseling Faculty, Webster University, Switzerland, **Jonathan Houdmont** Assistant Professor of Occupational Health Psychology, Division of Psychiatry and Applied Psychology, School of Medicine, University of Nottingham, United Kingdom, and **Roslyn Thomas** Associate Professor, Psychology, Sociology and Professional Counseling Faculty, Webster University, Switzerland

This study sought to examine stress-related working conditions—defined in terms of effort–reward imbalance (ERI)—and their association with burnout among a large, international sample of humanitarian aid workers. Descriptive statistics were applied to cross-sectional survey data (N=1,980) to profile ERI and burnout and Pearson's χ^2 tests were used to characterise associated socio- and occupational-demographic factors. Associations between ERI and burnout were established using binary logistic regression to generate odds ratios and 95 per cent confidence intervals adjusted for potential confounding variables. For high emotional exhaustion, the prevalence rate was 36 per cent for women and 27 per cent for men, whereas the proportions for high depersonalisation and low personal achievement were 9 and 10 per cent and 47 and 31 per cent, respectively. Intermediate and high ERI was associated with significantly increased odds of high emotional exhaustion; the findings were mixed for depersonalisation and personal achievement.

Keywords: burnout, effort–reward imbalance, humanitarian aid worker

Introduction

The role of the humanitarian aid worker encompasses the protection of civilians and the provision of food, health services, shelter, and water to vulnerable populations in global crises and emergencies, such as prolonged civil conflict and situations of disaster and poverty (Tassell and Flett, 2007). The humanitarian work environment is characterised by a number of unique and challenging characteristics (McCall and Salama, 1999; McFarlane, 2004), resulting in humanitarian aid workers being at elevated risk of traumatic stress (related to experiencing or witnessing life–threatening events), chronic stress (related to environmental stressors and under resourced and difficult living conditions), and organisational stress (related to aspects of the work setting, such as team conflict) (Cardozo and Salama, 2002). Frequently, furthermore, they are separated from regular sources of psychological and social support during deployment (community of family ties, for instance) that may serve as a buffer against undesirable stress–related outcomes (Eriksson et al., 2009). Prolonged exposure to difficult work environments may impact the mental and physical health of humanitarian aid workers (Wilson and Lindy, 1994; Sheik et al., 2000; Eriksson et al.,

2001; King, 2002; Blanchetiere, 2006). Previous research has shown that humanitarian aid workers are at increased risk of various undesirable states, especially during the three to six months after deployment (McCormack, Orenstein, and Joseph, 2016), including anxiety, burnout depression, and post-traumatic stress disorder (PTSD) (Cardozo et al., 2005; Connorton et al., 2011; Ager et al., 2012), as well as hazardous alcohol consumption (Jachens, Houdmont, and Thomas, 2016).

Burnout is commonly defined as a state of emotional, mental, and physical exhaustion owing to long-term exposure to an extensive range of stressors in an emotionally demanding work context (Schaufeli and Enzmann, 1998; Maslach, Schaufeli, and Leiter, 2001; Schaufeli and Greenglass, 2001). Burnout is generally conceptualised as having three dimensions: emotional exhaustion (EE); depersonalisation (DP); and (reduced) personal accomplishment (PA) (Maslach, Jackson, and Leiter, 1996). EE refers to feelings of being emotionally drained and unable to unwind or recover; DP is characterised by negative, excessively distant, and cynical attitudes towards the people being cared for (such as a victim of civil conflict); and PA is seen as ineffectiveness or inefficacy, and covers feelings of personal failure and incompetence or a lack of achievement in one's work (Cole et al., 2012). Burnout has been shown to be prevalent among human service professionals such as healthcare workers (Hare, Pratt, and Andrews, 1988; McGee, 1989; Lee and Ashforth, 1993; Jeanneau and Armelius, 2000; Stevens and Higgins, 2002; Rupert and Morgan, 2005; Rupert and Kent, 2007), police officers (Houdmont, 2013; Houdmont and Randall, 2016), and humanitarian workers (Tassell and Flett, 2007). Concerns have been expressed about the prevalence of burnout among humanitarian aid workers, with rates of 21–45 per cent for EE, 10–24 per cent for DP, and 23–49 per cent for PA (Eriksson et al., 2009; Ager et al., 2012; Cardozo et al., 2012).

Burnout is an important barometer of worker health given its demonstrated association with mental and physical health risks such as anxiety (Oehler et al., 1991), cardiovascular disease (Toker et al., 2005; Toppinen-Tanner et al., 2009), coronary heart disease (Toker et al., 2012), depression (Peterson et al., 2008), diseases of the circulatory, respiratory, and musculoskeletal systems (Toppinen-Tanner et al., 2005), and heightened levels of mortality (Ahola et al., 2010). Burnout also compromises the effectiveness of organisations (Chiu and Tsai, 2006), increases the risk of future absenteeism (Toppinen-Tanner et al., 2005) and impaired performance (Demerouti, Bakker, and Leiter, 2014), and has detrimental consequences for patient–client care and contentment (Girgis, Hansen, and Goldstein, 2009).

Given the potential harmful effects of burnout on health and work outcomes, a key objective of this research is to examine its work-related correlates. The occupational health literature has revealed consistently that workplace characteristics concerned with the design, management, and organisation of work—so-called psychosocial hazards or organisational stressors—may influence burnout and health (Sverke, Hellgren, and Näswall, 2002; Stansfeld and Candy, 2006; Bonde, 2008; Schütte et al., 2014). Studies have shown repeatedly that it is the organisational facets of emergency service work rather than the operational aspects (such as exposure

to trauma as part of one's occupation) that employees report as being the primary sources of stress and that are most strongly linked to negative outcomes (Brough, 2004; Houdmont, 2016).

Theoretically based, this study aims to be the first to contribute to an understanding of the relationships between organisational stressors and burnout in this occupational group using the effort–reward imbalance (ERI) model. The two most influential job stress models are the ERI (Siegrist, 1996) and job strain (Karasek and Theorell, 1990). Associations between the elements of each model and burnout have been demonstrated, although these appear to be slightly stronger and more consistent for the ERI model (see Chirico, 2016). In a review of job-related well-being studies, all employees with high effort and low reward had an elevated risk of the burnout component emotional exhaustion (van Vegchel et al., 2005). In light of the complexity of work-related psychosocial factors there are benefits to be yielded from measurement informed by an established theoretical model, not least because this can influence the design and direct the targeting of health promotion interventions in an evidence-based manner.

The ERI model focuses on the relation between effort spent at work and occupational rewards received in return, comprising career opportunities, esteem, job security, and salary. The model posits that a lack of reciprocity between 'costs' and 'gains' (perceived imbalance between high effort/low reward) may produce a state of emotional distress leading to an increased risk of ill health such as cardiovascular disease and musculoskeletal disorders (van Vegchel et al., 2005). The model differentiates between extrinsic efforts (job conditions such as demands) and intrinsic efforts known as overcommitment (OC). Overcommitted individuals have an excessive devotion to work that can intensify the negative effects of ERI (Siegrist, 1996). They are also more vulnerable to burnout as they have more need of approval and control, and will exert disproportionate effort under low reward conditions (Bakker et al., 2000). Consequently, the model also explains individual variation owing to the experience of stress being a process of transaction between the person and the environment.

Linkages between ERI and burnout have been exhibited in a number of studies among human service professionals such as nurses and teachers (Bakker et al., 2000; Schulz et al., 2009). Burnout seems to be a sensitive outcome of effort–reward imbalance and its principles of reciprocity (Bakker et al., 2000) as it occurs, in particular, in occupations with considerable human interaction (Marmot, Siegrist and Theorell, 1999). However, research on the prevalence and work correlates of burnout experienced by humanitarian aid workers is limited (Adams, Boscarino, and Figley, 2006). The dominant stress or conceptual framework to interpret the humanitarian work environment has been through the stress paradigms of PTSD and trauma (Thomas, 2008), and this is reflected in the literature (see Connorton, 2011). A few humanitarian aid worker-related investigations have identified the importance of exposure to trauma and more frequently experienced organisational or chronic stressors (such as living conditions, security concerns, team conflicts, and workload) in affecting aid worker burnout (Ager, 2012; Cardozo et al., 2012).

One limitation of humanitarian studies when assessing the prevalence of burn-out is that they fail to report results separately for expatriates (international, working in a country other than their native one) and locals (national, recruited from the host population). Expatriates face distinctive challenges, such as separation from family and friends and difficulties in adjusting abroad, while also benefiting from unique rewards such as financial incentives (Black and Mendenhall, 1991; Gregersen and Black, 1999). Local workers report tensions due to the unequal treatment of expatriate and local/national staff (Ager et al., 2012).

The existent literature is further limited by a reliance on small samples, potentially restricting generalisability, and a focus on a single geographical region or no comparisons being made between geographical locations of relevant variables, known to influence gender differences in burnout (Purvanova and Muros, 2010).

This study considers a theoretical stress model for the development of burnout in humanitarian aid workers. By using the ERI model, it moves beyond the assumption that the mere presence (or absence) of a given environmental factor will lead to employee strain as the model addresses complex socio-emotional processes in the workplace, and explicitly acknowledges individual differences in the form of a cognitive-motivational pattern (termed 'overcommitment'). Since organisations can play a key role in reducing psychosocial risks (McCormack and Joseph, 2012), further research is imperative to generate an evidence base to guide the design of preventative interventions.

Aims

This is the first study to our knowledge to apply a theoretical model of job stress in relation to burnout in the humanitarian context. In view of the exploratory nature of the research, the following questions were addressed:

1. What is the prevalence of burnout in a large international sample of expatriate and local humanitarian aid workers?
2. What is the relationship between socio- and occupational-demographic characteristics and burnout among humanitarian aid workers?
3. What is the relationship between psychosocial working conditions (defined in terms of the ERI model) and burnout among humanitarian aid workers?

Method
Participants and procedure

The sample was composed of expatriate and local employees of an international humanitarian organisation that operates in more than 100 locations worldwide. This multilateral entity receives financial support from multiple countries and provides aid to people afflicted by complex humanitarian crises or disasters (Archer, 2003).

All employees (N=9,062) received an e-mail inviting them to participate in an online survey. The message detailed the purpose of assessing the well-being of the workforce and assured individuals of anonymity and confidentiality. The survey was available for two months and no incentives were offered. Permission to administer the Maslach Burnout Inventory (MBI) was obtained. Ethical approval was granted by the Institutional Review Board at Webster University in the United States and the research followed the Code of Human Research Ethics of the British Psychological Society (2014). The measures noted here formed part of a questionnaire that examined a broad range of constructs and experiences; these will be reported in other papers.

Measurement

Independent variables

The abbreviated ERI questionnaire was employed in this project (Siegrist, 1996). This instrument has been used in numerous occupational health studies (see Tsutsumi and Kawakami, 2004; van Vegchel et al., 2005) and comprises 16 Likert-scaled items that are scored on a four-point scale (1=strongly disagree, 2=disagree, 3=agree, and 4=strongly agree). Effort (three items, α=0.77), the first component, is defined as the demanding aspects of the work environment (for instance, 'I face constant time pressure due to a heavy workload', or 'over the past few years my job has become more and more demanding'). Reward (seven items, α=0.75) is operationalised as (i) esteem reward (two items, α=0.74; for instance, 'I receive the respect I deserve from my superiors'), (ii) reward related to promotion prospects (three items, α=0.63; for instance, 'my job promotion prospects are poor'), and (iii) job security (two items, α=0.52; for instance, 'I have experienced or I expect to experience an undesirable change in my work situation'). Overcommitment (six items, α=0.81) is a separate scale that measures an exhaustive style of coping with the demands of work (for instance, 'people close to me say I sacrifice too much for my job').

Responses are summed for each scale and the ERI ratio is calculated to assess the degree of imbalance between high cost and low gain at work as follows: effort/(reward×correction factor). The correction factor compensates for the differing number of items in the two scales (the number of reward items as the numerator divided by the number of effort items as the denominator). Following convention in the work–related stress scientific literature (see, for example, Kivimäki et al., 2002; Kouvonen et al., 2005), the resultant ERI score was divided into tertiles. A high-risk group (high efforts in relation to rewards) formed the upper tertile, and the lowest risk group (reference/baseline) indicated the position of low efforts relative to rewards. The sum overcommitment score was similarly divided into tertiles.

Dependent variables

The Maslach Burnout Inventory – Human Services Survey (MBI-HSS) (Maslach, Jackson, and Leiter, 1996) contains 22 statements that relate to each of the three

burnout domains: EE (nine items, scores range from 0–54, α=0.89; for instance, 'working with people all day is really a strain for me'); DP (five items, scores range from 0–30, α=0.67; for instance, 'I worry that this job is hardening me emotionally'); and PA (eight items, scores range from 0–48, α=0.79; 'I feel very energetic'). Responses are ranked according to a seven-point Likert scale, indicating frequency of experience ranging from zero (never) to six (every day). Summing the applicable items produces the scores for each of the three domains.

High scores for EE and DP and low scores for PA are indicative of burnout. The *MBI Manual* provides normative data for each burnout subscale and cut-off points for categorisation. Scores are considered to be high if they are in the upper third of the normative distribution, average if they are in the middle third, and low if they are in the lower third. High risk for burnout is typically associated with scores of 27 or more for EE, 13 or more for DP, and 31 or less for PA (Maslach, Jackson, and Leiter, 1996). When calculating odds ratios, these cut-offs were used to dichotomise each subscale (into a low risk and an at-risk group).

Covariates

Information was collected on age, gender, marital status (single or cohabiting), family status (having children of less than 18 years at home), expatriate (international) or local (national) staff, and geographical region (where employees were working at the time of the survey). The hardship level of specific locations was rated by the organisation based on access to resources (accommodation, food, health services) and threats to security. These ratings are known in this study as high (more difficult access to resources and a higher security threat), moderate, and low (easier access to resources and a lower security threat) hardship zones.

There are high correlations between job burnout and secondary traumatic stress (STS) (vicarious exposure to trauma) and PTSD (direct exposure to trauma) (Jenkins and Baird, 2002; Mitani et al., 2006; Cieslak et al., 2014). The research in this area suffers from definitional and measurement challenges. The measures chosen here for PTSD and STS are linked conceptually only to those workplace factors that refer to direct or indirect exposure to trauma content (Cieslak et al., 2014). As humanitarian aid workers are vulnerable to trauma-related outcomes (Musa and Hamid, 2008), this study measured the risk of PTSD and STS so that the potential confounding effects of these variables could be controlled in analyses.

PTSD symptoms were evaluated using the PCL-6 (PTSD Checklist, abbreviated civilian version), a well-established self-report measure with good psychometric properties (Wilkins, Lang, and Norman, 2011). The items ask respondents to rate the degree to which they were bothered by symptoms related to a stressful experience in the past month on a five-point rating scale, where 1=not at all, 2=a little bit, 3=moderately, 4=quite a bit, and 5=extremely (α=0.90).

The Secondary Traumatic Stress Scale (STSS) (Bride et al., 2004) was designed to gauge the frequency of intrusion, avoidance, and arousal symptoms associated with

indirect exposure to traumatic events (focusing on symptoms resembling PTSD). The STSS (17 items, α=0.94) assesses a set of symptoms similar to those of PTSD (American Psychiatric Association, 2000). Respondents are instructed to indicate how frequently the statement made by each item was true for them in the past seven days using a five–point Likert-scale, where 1=never, 2=rarely, 3=occasionally, 4=often, and 5=very often. A cut-off of 38 or more was used for STSS scores, indicating the presence of secondary stress (Bride, 2007).

Data analytic strategy

Descriptive statistics were calculated for each of the study variables, with Pearson's χ^2 tests administered to compare prevalence across both socio- and occupational-demographic categories. Bivariate correlations were applied to appraise relationship valence (positive or negative) and strength between independent (predictor) variables (ERI, OC), the covariates (PTSD, STS), and the target variable burnout (EE, DP, and PA) dimensions.

ERI was regressed on to each burnout dimension in three logistic regression models: Model 1, unadjusted (crude); Model 2, partially adjusted, taking into account socio-demographic and occupational variables that may influence the relationships under investigation; and Model 3, fully adjusted for the same variables as Model 2 plus secondary stress and PTSD. In each logistic regression, the hypothetically least adverse work condition was selected as a reference category (Kouvonen, 2005). All regression models—one for each burnout dimension—were run separately for males and females because (i) each population (male and female) was large enough for independent analysis and (ii) gender was associated with two of the three burnout components (EE and PA). Regressions for the ERI and OC variables were also run separately to avoid multicollinearity. Missing data were excluded pairwise (meaning that the cases were excluded only if they were missing data required for the specific analysis), as recommended by Pallant (2010). Owing to missing data, the total number of participants varies for each variable under consideration. Data analysis was performed using SPSS (Statistical Package for the Social Sciences) version 22.

Results

Evaluable questionnaires were received from 1,980 of the 9,062 employees invited to participate in the survey, a response rate of 22 per cent. The demographic and occupational profile of this sample was broadly consistent with that of the survey population with the exception that female humanitarian aid workers were slightly overrepresented (χ^2=5.83, $p<0.05$).

Descriptive statistics

The mean respondent age was 40.73 years (standard deviation (SD)=9.35), and individuals between 35 and 44 (n=697) constituted the largest age group. Females

comprised 53.7 per cent of the sample (n=1,063), with males making up the remaining 46.3 per cent (n=917). Almost two-thirds of the respondents were married (62 per cent, n=1,210), 36 per cent were single (n=595), and 8 per cent divorced or widowed (n=158).

Overall, 32 per cent of humanitarian aid workers were at risk of EE, 43 per cent of PA, and 10 per cent of DP. Cross-tabulations (Pearson chi-squares) between the socio-demographic variables, ERI, OC, and burnout components are presented in Table 1. Gender, marital status, and age were each significantly associated with one or more ERI or burnout elements. Specifically: gender was associated with EE ($p<0.001$) and PA ($p<0.001$) (females were more at risk than males); marital status was associated with EE ($p<0.01$) (those who were single, divorced, or widowed were more at risk than those who were married); and age was associated with OC ($p<0.01$) and DP ($p<0.01$) (those less than 34 years old were more at risk than members of older groups).

Table 1. Associations between socio-demographic characteristics, ERI, and burnout

Variables	N (%)	ERI (highest tertile) n (%)	Overcommitment (highest tertile) n (%)	EE (at risk) n (%)	DP (at risk) n (%)	PA (at risk) n (%)
Gender						
Male	917 (46)	370 (34)	363 (40)	247 (27)	92 (10)	357 (39)
Female	1,063 (54)	312 (35)	395 (37)	377 (356)	96 (9)	495 (47)
Chi square	–	0.13	1.23	16.47	0.60	11.29
p value	–	0.72	0.27	**p<0.001**	0.44	**p<0.001**
Marital status						
Married/cohabiting	1,210 (62)	408 (34)	478 (40)	350 (29)	105 (9)	512 (42)
Single, divorced or widowed	753 (38)	264 (35)	274 (36)	265 (35)	81 (11)	329 (44)
Chi square	–	0.37	1.91	8.59	2.41	0.35
p value	–	0.54	0.17	**p<0.01**	0.13	0.57
Age						
≤34	569 (29)	175 (31)	184 (32)	190 (34)	74 (13)	251 (44)
35–44	697 (36)	244 (35)	277 (40)	222 (32)	57 (8)	287 (41)
45–54	492 (25)	174 (35)	207 (42)	141 (29)	43 (9)	213 (43)
≥55	181 (9)	71 (39)	73 (40)	52 (29)	11 (6)	79 (44)
Chi square	–	5.53	12.46	3.47	12.26	1.19
p value	–	0.14	**p<0.01**	0.32	**p<0.01**	0.76

Note: significant findings are in bold.

Source: authors.

Table 2. Associations between occupational-demographic characteristics, effort–reward imbalance, and burnout

Variables	N (%)	ERI (highest tertile) n (%)	Overcommitment (highest tertile) n (%)	EE (at risk) n (%)	DP (at risk) n (%)	PA (at risk) n (%)
Region						
Americas	161 (8)	51 (32)	47 (29)	57 (35)	5 (3)	54 (34)
Europe	274 (14)	86 (31)	80 (29)	78 (29)	22 (8)	155 (57)
Africa	578 (29)	189 (33)	244 (42)	150 (26)	56 (10)	172 (30)
Middle East and North Africa	421 (21)	178 (42)	182 (43)	167 (40)	62 (15)	187 (45)
Asia-Pacific	301 (15)	79 (26)	98 (33)	63 (21)	21 (7)	135 (45)
Switzerland	245 (13)	99 (40)	107 (44)	109 (45)	22 (9)	149 (61)
Chi square	–	26.72	30.54	58.55	24.10	100.43
p value	–	**p<0.01**	**p<0.001**	**p<0.001**	**p<0.001**	**p<0.001**
Expatriate/local						
Expatriate	703 (38)	247 (35)	285 (41)	240 (34.1)	73 (10.4)	337 (48)
Local	1129 (62)	379 (34)	428 (38)	329 (29.2)	98 (8.7)	444 (39)
Chi square	–	0.47	1.26	5.00	1.50	12.91
p value	–	0.49	0.26	**0.03***	0.25	**p<0.001**
Hardship zone level						
High	546 (28)	162 (30)	236 (43)	144 (26)	53 (10)	176 (32)
Moderate	476 (24)	162 (34)	177 (37)	148 (31)	42 (9)	195 (23)
Low	927 (48)	346 (37)	336 (36)	325 (35)	90 (10)	471 (51)
Chi square	–	8.96	7.48	12.18	0.35	49.83
p value	–	**0.01***	**0.02***	**p<0.01**	0.84	**p < .001**

Notes: significant findings are in bold; *$p<0.05$.

Source: authors.

Table 3. Descriptive statistics and correlations between the study variables

Variables	Mean	SD	1	2	3	4	5	6
1. ERI	1.31	0.50						
2. OC	16.60	3.22	0.53**					
3. PTSD	12.61	5.86	0.43**	0.47**				
4. STS	34.97	12.41	0.43**	0.46**	0.68**			
5. EE	20.51	12.52	0.54**	0.52**	0.54**	0.64**		
6. PA	32.05	10.35	-0.07**	-0.01	-0.10**	-0.16**	-0.01**	
7. DP	5.21	5.26	0.32**	0.30**	0.41**	0.57**	0.56**	-0.04

Notes: *p<0.05; **p<0.01, two-tailed.
Source: authors.

Similarly, cross-tabulations revealed that each occupational factor was significantly associated with one or more of the ERI or burnout dimensions (see Table 2). Work region was significantly associated with each measure—ERI ($p<0.001$), OC ($p<0.001$), and burnout ($p<0.05$), EE ($p<0.001$), DP ($p<0.001$) and PA ($p<0.001$) risk. In addition, country of origin (expatriate versus local) was significantly associated with EE ($p<0.05$) and PA ($p<0.001$).

Correlations indicated significant relationships (see Table 3) between the independent (predictor) variables (ERI, OC), the covariates (PTSD, STS), and the target variable burnout (EE, DP, PA dimensions), with the exception of that between OC and PA. Both PTSD and STS were significantly and positively correlated with EE and DP (range $r=0.41$–0.64, $p<0.01$), and negatively with PA ($r=-0.1$–-0.16, $p<0.01$). All of the correlation relationships were in the expected direction.

Relations between ERI and burnout

Although the bivariate correlations lend support for the relevance of the ERI model variables to burnout, they do not clarify the extent to which ERI and OC additively account for burnout after controlling for the influence of covariates (PTSD, STS). Logistic regression was undertaken, therefore, to respond to this aim of the study.

ERI was significantly associated with EE (see Table 4) in the crude and adjusted models. For instance, in Model 2 (adjusted for age, marital status, local/expatriate status, hardship level, and region), the odds ratio (OR) of male and female respondents with high ERI for EE was 18.29 (confidence interval (CI): 10.39–32.22, $p<0.001$) and 12.58 (CI: 8.12–19.49, $p<0.001$), respectively. After adjusting further for secondary stress and PTSD (final model), these odds ratios remained significant but fell by around one-half.

DP was significantly associated with high ERI, high efforts, low rewards, and OC in the crude model and Model 2 (see Table 5). For instance, in Model 2, women and men with high OC were 5.88 and 5.84 times more likely to experience DP than

Table 4. Associations between ERI and EE

Stress indicators	Model 1 (crude)				Model 2		Model 3	
	Female		Male		Female	Male	Female	Male
	N (%)	OR (95% CI)	N (%)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Effort								
Low	56 (15)	1.00 (reference)	31 (13)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	68 (18)	**2.26 (1.52–3.36)***	46 (17)	**2.83 (1.73–4.63)***	**2.08 (1.36–3.19)**	**2.60 (1.52–4.44)***	1.10 (0.62–1.96)	2.05 (0.97–4.34)
High	253 (67)	**8.45 (6.00–11.90)***	170 (70)	**10.15 (6.64–15.52)***	**7.93 (5.46–11.51)***	**10.24 (6.48–16.19)***	**4.15 (2.46–7.01)***	**7.45 (3.93–14.12)***
Reward								
High	79 (21)	1.00 (reference)	31 (13)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	113 (30)	**1.82 (1.30–2.55)***	68 (27)	**3.18 (2.00–5.04)***	**1.94 (1.35–2.78)***	**3.65 (2.22–6.01)***	1.68 (0.99–2.86)	**2.89 (1.44–5.80)**
Low	185 (49)	**3.77 (2.73–5.21)***	148 (60)	**8.16 (5.31–12.55)***	**4.11 (2.88–5.84)***	**8.93 (5.58–14.27)***	**2.67 (1.57–4.54)***	**4.11 (2.11–8.02)***
ERI								
Low	38 (10)	1.00 (reference)	17 (7)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	111 (29)	**3.26 (2.18–4.89)***	68 (27)	**5.15 (2.94–8.99)***	**3.42 (2.20–5.30)***	**4.99 (2.77–8.99)***	**2.14 (1.18–3.86)***	**3.98 (1.78–8.88)**
High	228 (61)	**12.13 (8.14–18.05)***	162 (66)	**18.55 (10.84–31.74)***	**12.58 (8.12–19.49)***	**18.29 (10.39–32.22)***	**6.08 (3.30–11.20)***	**9.88 (4.59–21.30)***
OC								
Low	60 (16)	1.00 (reference)	23 (9)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	82 (22)	**2.84 (1.94–4.15)***	61 (25)	**4.93 (2.95–8.26)***	**2.72 (1.78–4.13)***	**5.99 (3.37–10.64)***	1.53 (0.86–2.72)	**2.52 (1.15–5.52)***
High	235 (62)	**8.69 (6.19–12.20)***	163 (66)	**10.81 (6.74–17.32)***	**9.75 (6.70–14.21)***	**14.21 (8.35–24.18)***	**3.36 (1.97–5.67)***	**5.25 (2.51–10.97)***

Notes: significant findings are in bold: *p<0.05; **p<0.01; p<0.001***. Model 2 adjusted for age, marital status, local/expatriate status, hardship level, and region. Model 3 further adjusted for secondary stress and PTSD.

Source: authors.

Table 5. Associations between ERI and DP

Stress indicators	Model 1 (crude)				Model 2		Model 3	
	N (%)	Female OR (95% CI)	N (%)	Male OR (95% CI)	Female OR (95% CI)	Male OR (95% CI)	Female OR (95% CI)	Male OR (95% CI)
Effort								
Low	19 (21)	1.00 (reference)	13 (13)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	17 (18)	**2.69 (1.32– 5.47)****	21 (22)	1.52 (0.77–2.99)	**2.45 (1.14– 5.23)***	1.28 (0.62– 2.66)	1.41 (0.53– 3.70)	0.96 (0.37– 2.50)
High	56 (61)	**4.86 (2.63– 8.99)*****	62 (65)	**3.44 (2.00– 5.92)*****	**5.05 (2.61– 9.77)*****	**3.19 (1.80– 5.68)*****	**3.09 (1.32– 7.26)****	1.54 (0.70– 3.38)
Reward								
High	16 (17)	1.00 (reference)	17 (18)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	23 (25)	**2.15 (1.17– 3.95)***	32 (33)	1.80 (0.93– 3.48)	**2.35 (1.20– 4.60)***	1.79 (0.90– 3.58)	1.65 (0.70– 3.88)	1.31 (0.53– 3.25)
Low	53 (58)	**3.05 (1.71– 5.41)*****	47 (49)	**3.85 (2.15– 6.89)*****	**3.95 (2.09– 7.48)*****	**3.73 (2.02– 6.89)*****	1.62 (0.70– 3.74)	1.48 (0.63– 3.48)
ERI								
Low	13 (14)	1.00 (reference)	15 (16)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	24 (26)	1.44 (0.74– 2.80)	24 (25)	**2.02 (1.01– 4.06)***	1.34 (0.66– 2.83)	**2.16 (1.04– 4.48)***	0.92 (0.35– 2.37)	1.37 (0.52– 3.58)
High	55 (60)	**3.78 (2.09– 6.81)*****	57 (59%)	**4.89 (2.69– 9.16)*****	**4.64 (2.42– 8.92)*****	**4.62 (2.38– 8.97)*****	2.19 (0.90– 5.38)	1.26 (0.50– 3.01)
OC								
Low	13 (14)	1.00 (reference)	14 (14)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	23 (25)	**2.20 (1.08– 4.51)***	18 (19)	**2.77 (1.37– 5.60)****	**2.19 (1.01– 4.76)***	**3.44 (1.57– 7.55)****	1.36 (0.48– 3.82)	0.98 (0.34– 2.79)
High	56 (61)	**5.54 (3.05– 10.05)*****	64 (67)	**4.43 (2.38– 8.27)*****	**5.88 (3.06– 11.33)*****	**5.84 (2.8– 11.92)*****	**2.55 (1.00– 6.48)***	1.17 (0.44– 3.13)

Notes: significant findings are in bold: *p<0.05; ** p<0.01; p<0.001***. Model 2 adjusted for age, marital status, local/expatriate status, hardship level, and region. Model 3 adjusted additionally for secondary stress and PTSD.

Source: authors.

Table 6. Associations between ERI and PA

Stress indicators	Model 1 (crude)				Model 2		Model 3	
	N (%)	Female OR (95% CI)	N (%)	Male OR (95% CI)	Female OR (95% CI)	Male OR (95% CI)	Female OR (95% CI)	Male OR (95% CI)
Effort								
Low	176 (35)	1.00 (reference)	128 (36)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	108 (22)	0.94 (0.68–1.29)	90 (25)	1.26 (0.89–1.78)	0.90 (0.64–1.27)	1.20 (0.82–1.76)	0.99 (0.63–1.55)	0.90 (0.56–1.45)
High	211 (43)	1.16 (0.88–1.52)	139 (39)	1.20 (0.88–1.63)	1.07 (0.79–1.46)	1.08 (0.77–1.51)	0.97 (0.60–1.42)	0.83 (0.53–1.30)
Reward								
High	176 (36)	1.00 (reference)	136 (38)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	163 (33)	1.25 (0.93–1.68)	114 (32)	**1.47 (1.05–2.05)***	1.23 (0.89–1.69)	**1.72 (1.19–2.47)****	1.23 (0.81–1.89)	1.51 (0.95–2.40)
Low	156 (31)	1.26 (0.94–1.69)	107 (30)	**1.51 (1.09–2.07)***	1.22 (0.88–1.68)	**1.60 (1.13–2.27)****	1.01 (0.65–1.59)	1.07 (0.66–1.73)
ERI								
Low	141 (29)	1.00 (reference)	104 (29)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	170 (34)	1.12 (0.83–1.51)	120 (34)	1.34 (0.97–1.87)	1.24 (0.89–1.71)	1.29 (0.90–1.85)	1.12 (0.73–1.73)	1.18 (0.75–1.87)
High	184 (37)	1.29 (0.96–1.74)	133 (37)	**1.47 (1.06–2.03)***	1.24 (0.89–1.73)	**1.43 (1.00–2.03)***	1.10 (0.68–1.79)	1.05 (0.65–1.72)
OC								
Low	176 (35)	1.00 (reference)	134 (38%)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
Intermediate	133 (27)	**1.51 (1.09–2.06)***	89 (25)	0.96 (0.68–1.36)	**1,49 (1.06–2.11)***	1.11 (0.76–1.62)	1.39 (0.88–2.20)	1.01 (0.62–1.64)
High	176 (35)	1.21 (0.92–1.56)	134 (37)	0.85 (0.62–1.15)	1.23 (0.91–1.67)	0.90 (0.64–1.26)	1.09 (0.70–1.69)	0.66 (0.40–1.07)

Notes: significant findings are in bold: *p<0.05; **p<0.01; p<0.001***. Model 2 adjusted for age, marital status, local/expatriate status, hardship level, and region. Model 3 further adjusted for secondary stress and PTSD.

Source: authors.

those with low OC (95 per cent CI: 3.06–11.33, $p<0.001$; 95 per cent CI: 2.8–11.92, $p<0.001$), respectively. None of the associations between DP and ERI or any ERI component was significant for the male sample when the model included additional adjustments for secondary stress and PTSD (Model 3). However, the associations between DP and high effort (OR=3.09, 95 per cent CI: 1.32–7.26, $p<0.01$) and high OC (OR=2.55, 95 per cent CI: 1.00–6.48, $p<0.01$) were significant for females when the model included adjustments for co-occurring outcomes (see Table 5; Model 3).

PA was not significantly associated with ERI or any ERI component in Model 3 (see Table 6; final adjusted model). All significant associations between PA and ERI or ERI components were gender-specific. For instance, PA was significantly associated with intermediate and low reward and with ERI in Models 1 and 2 (see Table 6), but only for males. In Model 2, men who reported intermediate rewards were 1.72 times more likely to experience reduced PA than those with low rewards (95 per cent CI: 1.19–2.47, $p<0.01$). Furthermore, PA was significantly associated with OC in Models 1 and 2, but only for females.

Discussion

This study profiles the descriptive epidemiology of burnout in a large international sample of expatriate and local humanitarian aid workers. It is the first to investigate relations between burnout and theoretically grounded stress-related working conditions in this sector. The following section contains a summary of the main findings of the research, and considers them in relation to the existing evidence base and in terms of their implications for policy, practice, and theory.

Prevalence and demographics of burnout

The proportion of participants at risk vis-à-vis each burnout dimension in this study was in the same range as found in previous analyses (Eriksson et al., 2009; Ager et al., 2012; Cardozo et al., 2012). Burnout was associated with age, gender, hardship zone level, region, and work status (expatriate/local). Consistent with past research, older human service professionals reported less burnout than their younger counterparts (Nyssen et al., 2003; Rupert and Morgan, 2005). Older individuals may have better stress management strategies (Ackerley et al., 1988), benefit from rich experience, and have higher occupational positions that ensure them respect, rewards, and diminished work–family conflict (Stevanovic and Rupert, 2004; Wang et al., 2014). Burnout appears to be more prevalent earlier in careers (Maslach, Schaufeli, and Leiter, 2001). It is also possible that individuals experiencing burnout have left the profession by the late stages of their working life.

Overall, gender has yielded mostly inconsistent findings in the burnout literature, with some studies reporting no differences in this regard (Ackerley et al., 1988) and others, like this one, detecting a significantly increased risk of EE among females (Rupert and Morgan, 2005; Purvanova and Muros, 2010; Ager et al., 2012). Sometimes,

gender is confounded with type of occupation and gender differences reported may in fact reflect occupational differences (Schaufeli and Greenglass, 2001). Another possible explanation is that women tend to be better at sharing their negative emotions, whereas men tend to suppress their emotional impulses, making them more susceptible to adopting cynical attitudes as a means of coping with stress (and hence more likely to report the depersonalisation component of burnout than women) (Schaufeli and Enzmann, 1998; Purvanova and Muros, 2010).

Respondents working in different regions, and different geographical zones categorised by hardship level (threat of harm and available resources), experienced significantly different levels of burnout. Surprisingly, for instance, those in less/low risk zones experienced higher burnout (EE, PA) than those working in zones categorised as high risk (such as a conflict area). Poghosyan, Aiken, and Sloane (2009) found that professionals from different countries performing the same job may differ in terms of their experience of job burnout. The determinants in the sociocultural context require further exploration as existing policies, social resources, and organisational characteristics are likely to vary across geographical areas.

Expatriates experienced a significantly higher level of EE and diminished PA as compared to local workers. There is a paucity of work on burnout among expatriates (Bhanugopan and Fish, 2006); however, research shows that burnout is related to the difficulties experienced in an unfamiliar setting and is related to unrealistic job expectations (Jackson and Schuler, 1982; Maslach and Jackson, 1984).

Relationship between ERI and burnout

The study findings support the notion that organisational experiences characterised by a lack of reciprocity or perceptions of inequity at work are significantly associated with emotional exhaustion, as demonstrated by other research involving non-humanitarian samples, such as physicians (Klein et al., 2010; Wang et al., 2014), police officers (Garbarino et al., 2013), and teachers (Bakker et al., 2000). Like us, Schulz et al. (2009) found the effort scale to be more strongly associated with emotional exhaustion (the major component of burnout) than the reward scale.

Existing research shows significant associations between job burnout, STS, and PTSD (Cieslak et al., 2014; Sheen, Spiby, and Slade, 2015). Witnessing or experiencing traumatic events can affect and stay with employees and could become burdens that might influence their ability to cope successfully (Backteman-Erlanson et al., 2011). This study has demonstrated, however, that even after adjusting for STS and PTSD covariates (with a resultant decrease in ORs), the ERI model still maintained a significant and strong relation with EE. Further investigation is needed to clarify the common and specific risk factors for these co-occurring mental health outcomes.

The strengths of this study include that it is the first to address burnout in a large and diverse sample of humanitarian aid workers across several geographical regions. It controlled for a number of possible confounding variables, permitting a focus on the contribution of psychosocial work factors to the risk of burnout. However, some

limitations should be considered. Notably, this study was cross-sectional, preventing conclusions about the direction of the reported relationships. Future longitudinal analyses should examine bi-directional effects that can advance theory on the complex mechanisms underlying stressor–health relations (De Lange et al., 2004).

The possibility of a healthy worker effect having produced an underestimation of the prevalence of burnout and the strength of association between ERI and burnout cannot be discounted. Employees with high ERI or high burnout scores may have been absent (sick leave) during the data collection period. The survey instrument was available for an extended period of time (two months) to help mitigate this effect. There were potential differences between responders and non-responders with respect to ERI, OC, and burnout variables that may restrict the generalisability of the results. The sample was large and representative of the population from which it was drawn, yet the response rate was low (22 per cent). As humanitarian aid workers frequently work in difficult circumstances, including conflict or disaster zones or situations of social isolation, resources and factors such as computer access and time may have prohibited completion of the survey. It is possible that other demographic or occupational variables, such as educational level or specific job type, not measured here, may also have influenced the relationship between ERI and burnout.

Despite the limitations, the results show that burnout among humanitarian aid workers is related to efforts (demands) and occupational rewards. A practical implication of this research is that perceptions of effort–reward balance are at least partly within the control of the organisation. ERI interventions aim to change a work environment to reduce the imbalance between effort and reward and thereby prevent negative health outcomes such as EE. The workplace can be modified (organisations can more or less choose the way in which they reward employees for their efforts) so that it is perceived as more rewarding and meaningful. Examples of reward measures are an improvement of promotion prospects, fair treatment and salary, enrichment of tasks, and opportunities for continuing skills training. The simultaneous reduction of workplace demands is likely to facilitate this perception (Rasmussen et al., 2016). Examples of intervention programmes aimed at adapting and/or regulating job demands/effort could include balancing the distribution of workload and providing sufficient opportunities to recover from work. Increasing the amount of positive feedback that humanitarian aid workers receive, offering appropriate training for career development, and enhancing the interpersonal relationship skills of managers and the social support they provide, are all examples of viable approaches to apply the ERI model to reduce burnout.

Conclusion

In this study ERI and overcommitment were significantly associated with an increased risk of emotional exhaustion in both male and female humanitarian aid workers, demonstrating that the ERI model has a useful contribution to make in facilitating an

understanding of relations between work-related psychosocial factors and psychological health in this realm. The findings suggest that the application of an established theoretical perspective to the assessment and control of work-related stress in the humanitarian aid sector is likely to facilitate effective stress management activities. Further research is recommended to explore other occupational health stress models, or a combination of models, to determine their linkages with psychological health in this field.

Acknowledgements

Correspondence

Liza Jachens, Psychology, Sociology and Professional Counseling Faculty, Webster University, Route de Collex 15, CH-1293 Bellevue, Switzerland.
Telephone: +41 22 959 8000; e-mail: jachens@webster.ch

References

Ackerley, G.D., J. Burnell, D.C. Holder, and L.A. Kurdek (1988) 'Burnout among licensed psychologists'. *Professional Psychology: Research and Practice.* 19(6). pp. 624–631.

Adams, R.E., J.A. Boscarino, and C.R. Figley (2006) 'Compassion fatigue and psychological distress among social workers: a validation study'. *The American Journal of Orthopsychiatry.* 76(1). pp. 103–108.

Ager, A. et al. (2012) 'Stress, mental health, and burnout in national humanitarian aid workers in Gulu, northern Uganda'. *Journal of Traumatic Stress.* 25(6). pp. 713–720.

Ahola, K., A. Väänänen, A. Koskinen, A. Kouvonen, and A. Shirom (2010) 'Burnout as a predictor of all-cause mortality among industrial employees: a 10-year prospective register-linkage study'. *Journal of Psychosomatic Research.* 69(1). pp. 51–57.

American Psychiatric Association (2000) *Diagnostic and Statistical Manual of Mental Disorders.* Fourth edition (text revised). American Psychiatric Association, Washington, DC.

Archer, S. (2003) 'Civilian and military cooperation in complex humanitarian operations'. *Military Review.* 83 (March–April). pp. 32–41. http://www.dtic.mil/dtic/tr/fulltext/u2/a485650.pdf (last accessed on 10 April 2018).

Backteman-Erlanson, S., A. Jacobsson, I. Öster, and C. Brulin (2011) 'Caring for traffic accident victims: the stories of nine male police officers'. *International Emergency Nursing.* 19(2). pp. 90–95.

Bakker, A.B., C.H. Killmer, J. Siegrist, and W.B. Schaufeli (2000) 'Effort–reward imbalance and burnout among nurses'. *Journal of Advanced Nursing.* 31(4). pp. 884–891.

Bhanugopan, R. and A. Fish (2006) 'An empirical investigation of job burnout among expatriates'. *Personnel Review.* 35(4). pp. 449–468.

Black, J.S. and M. Mendenhall (1991) 'The U-curve adjustment hypothesis revisited: a review and theoretical framework'. *Journal of International Business Studies.* 22(2). pp. 225–247.

Blanchetiere, P. (2006) *Resilience of Humanitarian Workers*. November. http://www.dochas.ie/Shared/Files/4/resilience-of-aid-workers.pdf (last accessed on 10 April 2018).

Bonde, J.P.E. (2008) 'Psychosocial factors at work and risk of depression: a systematic review of the epidemiological evidence'. *Occupational and Environmental Medicine*. 65(7). pp. 438–445.

Bride, B.E. (2007) 'Prevalence of secondary traumatic stress among social workers'. *Social Work*. 52(1). pp. 63–70.

Bride, B.E., M.M. Robinson, B. Yegidis, and C.R. Figley (2004) 'Development and validation of the secondary traumatic stress scale'. *Research on Social Work Practice*. 14(1). pp. 27–35.

British Psychological Society (2014) *Code of Human Research Ethics*. British Psychological Society, Leicester.

Brough, P. (2004) 'Comparing the influence of traumatic and organizational stressors on the psychological health of police, fire, and ambulance officers'. *International Journal of Stress Management*. 11(3). pp. 227–244.

Cardozo, B.L. and P. Salama (2002) 'Mental health of humanitarian aid workers in complex emergencies'. In Y. Danieli (ed.) *Sharing the Front Line and the Back Hills: International Protectors and Providers: Peacekeepers, Humanitarian Aid Workers and the Media in the Midst of Crisis*. Baywood Publishing Company, Amityville, NY. pp. 242–255.

Cardozo, B.L. et al. (2005) 'The mental health of expatriate and Kosovar Albanian humanitarian aid workers'. *Disasters*. 29(2). pp. 152–170.

Cardozo, B.L et al. (2012) 'Psychological distress, depression, anxiety, and burnout among international humanitarian aid workers: a longitudinal study'. *PLoS One*. 7(9). pp. e44948.

Chirico, F (2016) 'Job stress models for predicting burnout syndrome: a review'. *Annali dell'Istituto Superiore di Sanità*. 52(3). pp. 443–456.

Chiu, S.F. and M.C. Tsai (2006) 'Relationships among burnout, job involvement, and organizational citizenship behavior'. *The Journal of Psychology*. 140(6). pp. 517–530.

Cieslak, R. et al. (2014) 'A meta-analysis of the relationship between job burnout and secondary traumatic stress among workers with indirect exposure to trauma'. *Psychological Services*. 11(1). pp. 75–86.

Cole, M.S., F. Walter, A.G. Bedeian, and E.H. O'Boyle (2012) 'Job burnout and employee engagement a meta-analytic examination of construct proliferation'. *Journal of Management*. 38(5). pp. 1550–1581.

Connorton, E., M.J. Perry, D. Hemenway, and M. Miller (2011) 'Occupational trauma and mental illness: combat, peacekeeping or relief work and the NCS-R'. *Journal of Occupational and Environmental Medicine*. 53(12). pp. 1360–1363.

De Lange, A.H., T.W. Taris, M.A. Kompier, I.L. Houtman, and P.M. Bongers (2004) 'The relationships between work characteristics and mental health: examining normal, reversed and reciprocal relationships in a 4-wave study'. *Work and Stress*. 18(2). pp. 149–166.

Demerouti, E., A. Bakker, and M. Leiter (2014) 'Burnout and job performance: the moderating role of selection, optimization, and compensation strategies'. *Journal of Occupational Health Psychology*. 19(1). pp. 96–107.

Eriksson, C.B. et al. (2009) 'Social support, organisational support, and religious support in relation to burnout in expatriate humanitarian aid workers'. *Mental Health, Religion and Culture*. 12(7). pp. 671–686.

Eriksson, C.B., H. Vande Kemp, R. Gorsuch, S. Hoke, and D.W. Foy (2001) 'Trauma exposure and PTSD symptoms in international relief and development personnel'. *Journal of Traumatic Stress*. 14(1). pp. 205–212.

Garbarino, S., G. Cuomo, C. Chiorri, and N. Magnavita (2013) 'Association of work-related stress with mental health problems in a special police force unit'. *BMJ Open*. 3(7). p.e002791. http://bmjopen.bmj.com/content/3/7/e002791 (last accessed on 10 April 2018).

Girgis, A., V. Hansen, and D. Goldstein (2009) 'Are Australian oncology health professionals burning out? A view from the trenches'. *European Journal of Cancer*. 45(3). pp. 393–399.

Gregersen, H.B. and J.S. Black (1999) 'The right way to manage expats'. *Harvard Business Review.* 77(2). pp. 52–59.

Hare, J., C.C. Pratt, and D. Andrews (1988) 'Predictors of burnout in professional and paraprofessional nurses working in hospitals and nursing homes'. *International Journal of Nursing Studies.* 25(2). pp. 105–115.

Houdmont, J. (2013) 'UK police custody officers' psychosocial hazard exposures and burnout'. *Policing: An International Journal of Police Strategies and Management.* 36(3). pp. 620–635.

Houdmont, J. (2016) 'Stressors in police work and their consequences'. In R.J. Burke (ed.) *Stress in Policing: Sources, Consequences and Interventions.* Routledge, London. pp. 51–65.

Houdmont, J. and R. Randall (2016) 'Working hours and common mental disorders in English police officers'. *Occupational Medicine.* 66(9). pp. 713–718.

Jachens, L., J. Houdmont, and R. Thomas (2016) 'Effort–reward imbalance and heavy alcohol consumption among humanitarian aid workers'. *Journal of Studies on Alcohol and Drugs.* 77(6). pp. 904–913.

Jackson, S.E. and R.S. Schuler (1982) 'Preventing employee burnout'. *Personnel.* 60(2). pp. 58–68.

Jeanneau, M. and K. Armelius (2000) 'Self-image and burnout in psychiatric staff'. *Journal of Psychiatric and Mental Health Nursing.* 7(5). pp. 399–406.

Jenkins, S.R. and S. Baird (2002) 'Secondary traumatic stress and vicarious trauma: a validational study'. *Journal of Traumatic Stress.* 15(5). pp. 423–432.

Karasek, R. and T. Theorell (1990) *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life.* Basic Books, New York, NY.

King, D. (2002) 'Paying the ultimate price: an analysis of aid-worker fatalities'. *Humanitarian Exchange.* 21 (July). pp. 15–16. https://odihpn.org/wp-content/uploads/2002/10/humanitarianexchange021.pdf (last accessed on 10 April 2018).

Kivimäki, M. et al. (2002) 'Work stress and risk of cardiovascular mortality: prospective cohort study of industrial employees'. *British Medical Journal.* 325(7369). pp. 857–860.

Klein, J., F.K. Grosse, K. Blum, J. Siegrist, and O. dem Knesebeck (2010) 'Effort–reward imbalance, job strain and burnout among clinicians in surgery'. *Psychotherapie, Psychosomatik, Medizinische Psychologie.* 60(9–10). pp. 374–379.

Kouvonen, A. et al. (2005) 'Job strain, effort–reward imbalance, and heavy drinking: a study in 40,851 employees'. *Journal of Occupational and Environmental Medicine.* 47(5). pp. 503–513.

Lee, R.T. and B.E. Ashforth (1993) 'A longitudinal study of burnout among supervisors and managers: comparisons between the Leiter and Maslach (1988) and Golembiewski et al. (1986) models'. *Organizational Behavior and Human Decision Processes.* 54(3). pp. 369–398.

Marmot, M., J. Siegrist, T. Theorell, and A. Feeney (1999) 'Health and the psychosocial environment at work'. In M. Marmot and R. Wilkinson (eds.) *Social Determinants of Health.* Oxford University Press, Oxford. pp. 97–130.

Maslach, C. and S.E. Jackson (1984) 'Burnout in organizational settings'. In S. Oskamp (ed.) *Applied Social Psychology Annual: Applications in Organizational Settings.* Sage Publishing, Beverly Hills, CA. pp. 133–153.

Maslach, C., S.E. Jackson, and M.P. Leiter (1996) *Maslach Burnout Inventory Manual.* Consulting Psychologists Press, Palo Alto, CA.

Maslach, C., W.B. Schaufeli, and M.P. Leiter (2001) 'Job burnout'. *Annual Review of Psychology.* 52(1). pp. 397–422.

McCall, M. and P. Salama (1999) 'Selection, training, and support of relief workers: an occupational health issue'. *British Medical Journal.* 318(7176). pp. 113–116.

McCormack, L. and S. Joseph (2012) 'Postmission altruistic identity disruption questionnaire (Post AID/Q): preliminary development of a measure of responses following adverse humanitarian aid work'. *Traumatology.* 18(3). pp. 41–48.

McCormack, L., A. Orenstein, and S. Joseph (2016) 'Postmission altruistic identity disruption questionnaire (PostAID/Q): identifying humanitarian-related distress during the reintegration period following international humanitarian aid work'. *Traumatology.* 22(1). pp. 1–8

McFarlane, C.A. (2004) 'Risks associated with the psychological adjustment of humanitarian aid workers'. *Australasian Journal of Disaster and Trauma Studies.* 2004(1). http://www.massey.ac.nz/~trauma/issues/2004-1/mcfarlane.htm (last accessed on 10 April 2018).

McGee, R.A. (1989) 'Burnout and professional decision making: an analogue study'. *Journal of Counseling Psychology.* 36(3). pp. 345–351.

Mitani, S., M. Fujita, K. Nakata, and T. Shirakawa (2006) 'Impact of post-traumatic stress disorder and job-related stress on burnout: a study of fire service workers'. *The Journal of Emergency Medicine.* 31(1). pp. 7–11.

Musa, S.A. and A.A. Hamid (2008) 'Psychological problems among aid workers operating in Darfur'. *Social Behavior and Personality.* 36(3). pp. 407–416.

Nyssen, A.S., I. Hansez, P. Baele, M. Lamy, and V. De Keyser (2003) 'Occupational stress and burnout in anaesthesia'. *British Journal of Anaesthesia.* 90(3). pp. 333–337.

Oehler, J., M. Davidson, L. Starr, and D. Lee (1991) 'Burnout, job stress, anxiety, and perceived social support in neonatal nurses'. *Heart and Lung: The Journal of Critical Care.* 20(5 Pt. 1). pp. 500–505.

Pallant, J. (2010) *SPSS Survival Manual: A Step by Step Guide to Data Analysis using SPSS.* McGraw-Hill International, Maidenhead.

Peterson, U. et al. (2008) 'Burnout and physical and mental health among Swedish healthcare workers'. *Journal of Advanced Nursing.* 62(1). pp. 84–95.

Poghosyan, L., L.H. Aiken, and D.M. Sloane (2009) 'Factor structure of the Maslach burnout inventory: an analysis of data from large scale cross-sectional surveys of nurses from eight countries'. *International Journal of Nursing Studies.* 46(7). pp. 894–902.

Purvanova, R.K. and J.P. Muros (2010) 'Gender differences in burnout: a meta-analysis'. *Journal of Vocational Behavior.* 77(2). pp. 168–185.

Rasmussen, V. et al. (2016) 'Burnout among psychosocial oncologists: an application and extension of the effort–reward imbalance model'. *Psycho-Oncology.* 25(2). pp. 194–202.

Rupert, P.A. and D.J. Morgan (2005) 'Work setting and burnout among professional psychologists'. *Professional Psychology: Research and Practice.* 36(5). pp. 544–550.

Rupert, P.A. and J.S. Kent (2007) 'Gender and work setting differences in career-sustaining behaviors and burnout among professional psychologists'. *Professional Psychology: Research and Practice.* 38(1). pp. 88–96.

Schaufeli, W. and D. Enzmann (1998) *The Burnout Companion to Study and Practice: A Critical Analysis.* Taylor and Francis, London.

Schaufeli, W. and E. Greenglass (2001) 'Introduction to special issue on burnout and health'. *Psychology and Health.* 16(5). pp. 501–510.

Schulz, M. et al. (2009) 'Effort–reward imbalance and burnout among German nurses in medical compared with psychiatric hospital settings'. *Journal of Psychiatric and Mental Health Nursing.* 16(3). pp. 225–233.

Schütte, S. et al. (2014) 'Psychosocial working conditions and psychological well-being among employees in 34 European countries'. *International Archives of Occupational and Environmental Health.* 87(8). pp. 897–907.

Sheen, K., H. Spiby, and P. Slade (2015) 'Exposure to traumatic perinatal experiences and posttraumatic stress symptoms in midwives: prevalence and association with burnout'. *International Journal of Nursing Studies.* 52(2). pp. 578–587.

Sheik, M., M.I. Gutierrez, P. Bolton, and P. Spiegel (2000) 'Deaths among humanitarian workers'. *British Medical Journal.* 321(7254). pp. 166–168.

Siegrist, J. (1996) 'Adverse health effects of high-effort/low-reward conditions'. *Journal of Occupational Health Psychology.* 1(1). pp. 27–41.

Stansfeld, S. and B. Candy (2006) 'Psychosocial work environment and mental health—a meta-analytic review'. *Scandinavian Journal of Work, Environment and Health.* 32(6). pp. 443–462.

Stevanovic, P. and P.A. Rupert (2004) 'Career-sustaining behaviors, satisfactions, and stresses of professional psychologists'. *Psychotherapy: Theory, Research, Practice, Training.* 41(3). pp. 301–309.

Stevens, M. and D.J. Higgins (2002) 'The influence of risk and protective factors on burnout experienced by those who work with maltreated children'. *Child Abuse Review.* 11(5). pp. 313–331.

Sverke, M., J. Hellgren, and K. Näswall (2002) 'No security: a meta-analysis and review of job insecurity and its consequences'. *Journal of Occupational Health Psychology.* 7(3). pp. 242–264.

Tassell, N. and R. Flett (2007) 'Obsessive passion as an explanation for burnout: an alternative theoretical perspective applied to humanitarian work'. *The Australian Journal of Rehabilitation Counselling.* 13(2). pp. 101–114.

Thomas, R. (2008) *From Stress to Sense of Coherence: Psychological Experiences of Humanitarian Workers in Complex Humanitarian Emergencies*. Doctoral dissertation, University of Oxford, Oxford.

Toker, S., A. Shirom, I. Shapira, S. Berliner, and S. Melamed (2005) 'The association between burnout, depression, anxiety, and inflammation biomarkers: C-reactive protein and fibrinogen in men and women'. *Journal of Occupational Health Psychology.* 10(4). pp. 344–362.

Toker, S., S. Melamed, S. Berliner, D. Zeltser, and I. Shapira (2012) 'Burnout and risk of coronary heart disease: a prospective study of 8838 employees'. *Psychosomatic Medicine.* 74(8). pp. 840–847.

Toppinen-Tanner, S., A. Ojajärvi, A. Väänaänen, R. Kalimo, and P. Jäppinen (2005) 'Burnout as a predictor of medically certified sick-leave absences and their diagnosed causes'. *Behavioral Medicine.* 31(1). pp. 18–32.

Toppinen-Tanner, S., K. Ahola, A. Koskinen, and A. Väänänen (2009) 'Burnout predicts hospitalization for mental and cardiovascular disorders: 10-year prospective results from industrial sector'. *Stress and Health.* 25(4). pp. 287–296.

Tsutsumi, A. and N. Kawakami (2004) 'A review of empirical studies on the model of effort–reward imbalance at work: reducing occupational stress by implementing a new theory'. *Social Science and Medicine.* 59(11). pp. 2335–2359.

van Vegchel, N., J. de Jonge, H. Bosma, and W. Schaufeli (2005) 'Reviewing the effort–reward imbalance model: drawing up the balance of 45 empirical studies'. *Social Science and Medicine.* 60(5). pp. 1117–1131.

Wang, Z. et al. (2014) 'Physician burnout and its associated factors: a cross-sectional study in Shanghai'. *Journal of Occupational Health.* 56(1). pp. 73–83.

Wilkins, K.C., A.J. Lang, and S.B. Norman (2011) 'Synthesis of the psychometric properties of the PTSD checklist (PCL) military, civilian, and specific versions'. *Depression and Anxiety.* 28(7). pp. 596–606.

Wilson, J.P. and J.D. Lindy (1994) *Countertransference in the Treatment of PTSD*. Guilford Press, New York, NY.