Factors associated with common mental health problems of humanitarian workers in South Sudan

Hannah Strohmeier[1,2*], Willem F. Scholte[3,4], Alastair Ager[1,5]

[1] Institute for Global Health and Development, Queen Margaret University, Edinburgh, Scotland

[2] Department of Anthropology, Yale University, New Haven, Connecticut, United States of America

[3] Antares Foundation, Amsterdam, Netherlands

[4] Amsterdam UMC, Department of Psychiatry, University of Amsterdam, Amsterdam, Netherlands

[5] Mailman School of Public Health, Columbia University, New York, New York, United States of America

* Corresponding author
Email: Hannah.strohmeier@qmu.ac.uk

Abstract

Background: The latest data on major attacks against civilian aid operations have identified South Sudan as the most dangerous country for aid workers globally. Exposure to other traumatic events and chronic stress is also common in this population. No research exists on the mental health of humanitarian workers in South Sudan.

Objectives: This study examined symptom burden and predictors of posttraumatic stress disorder (PTSD), depression, anxiety, hazardous alcohol consumption, and burnout among humanitarian workers in South Sudan.

Method: We conducted a cross-sectional online survey with humanitarian workers (national and international staff, consultants, United Nations volunteers). We applied validated measures useful for this setting. We applied Least Absolute Shrinkage and Selection Operator (LASSO) regression to fit models with high prediction accuracy for each outcome and used ordinary least squares (OLS) regression to obtain final coefficients and perform inference.

Results: A total of 277 humanitarian workers employed by 45 organizations completed the survey (a response rate in the order of 10%). We estimated prevalence of PTSD (24%), depression (39%), anxiety disorder (38%), hazardous alcohol consumption in men (35%) and women (36%), and the burnout components emotional exhaustion (24%) and depersonalization (19%). Chronic stress exposure was positively associated with PTSD ($p<.001$), depression ($p<.001$), anxiety ($p<.001$), emotional exhaustion ($p<.01$), and depersonalization ($p<.001$). We found no significant association between emotion focused and problem focused coping and mental health outcomes. Associations between dysfunctional coping and depression ($p<.001$) and anxiety ($p<.01$) were positive. Higher levels of spirituality were associated

23   with lower risk of hazardous alcohol consumption (p<.001). Contrary to expectations, work-

24   ing directly with humanitarian aid beneficiaries was significantly associated with lower risk

25   for emotional exhaustion (p<.01).

26   **Conclusion:** Our results suggest that humanitarian workers in South Sudan experience sub-

27   stantial levels of mental ill-health. This study points to the need for staff support strategies

28   that effectively mitigate humanitarian workers' chronic stress exposure. The dynamics be-

29   tween coping and mental health among humanitarian workers require further study.

30

31

Introduction

The humanitarian needs in countries affected by crises are at an unprecedented level [1], and South Sudan is one of the countries in which the situation is worse than ever [2]. The ongoing conflict and inter-communal violence accompanied by economic decline and climatic shocks in the world's youngest nation have severe implications for its population [3]. The severity of the situation also bears a high level of risk for humanitarian workers operating in the country – dedicated professionals with the objective to alleviate the effects of the ongoing crisis. According to latest data from Humanitarian Outcomes [4,5], there were over thirty major attacks against civilian aid operations in 2015, and this increased to over fifty in 2016. This made South Sudan the most dangerous country for aid workers globally in both years [6,7]. The outbreak of violence in July 2016 in the country's capital Juba exemplifies the magnitude of the situation. Among other atrocities, humanitarian workers have been gang-raped, injured and killed, and embassies and international organizations felt compelled to temporarily evacuate large parts of their civilian personnel [8,9]. The number of deaths of humanitarian workers since independence has just reached 100 [10].

In addition to physical harm, such exposure to conflict and violence, traumatic events and chronic stress can lead to post-traumatic stress disorder (PTSD). Depression and anxiety are among the most common comorbid conditions of PTSD and associated with war-related trauma and daily stressors [11,12]. Hazardous alcohol consumption is another common comorbid condition of PTSD [11,13]. Chronic stress at the workplace leads also frequently to burnout [14].

4

Some humanitarian workers manage life amidst crisis settings without developing symptoms of mental illness; some even seem to thrive in this type of work [15]. However, as previous studies confirm, PTSD, depression, anxiety, and burnout are indeed widespread among this occupation group; established prevalence rates are mostly similar to or higher than those of reference groups cited in the respective literature (e.g., [16-22]). Hazardous alcohol consumption received very little attention in the literature on humanitarian workers [23].

Regarding predictors, multiple studies confirm the positive association between chronic stress and traumatic event exposure and common mental health problems among humanitarian workers (e.g., [17,18,22,24,25]). Similarly, research identifies social support and team cohesion as important resilience factors among this occupation group (e.g., [17,18,20,22]). However, a number of gaps remain in the literature: Several studies analyzed the effect of organizational support, understood as the provision of benefits and services (e.g., medical insurance, counseling), or satisfaction with organizational culture (e.g., encouragement to take vacations). Lopes Cardozo et al. [22,26] and Eriksson et al. [27] found that both national and international staff satisfied with their organizations' culture experience higher risk of mental ill-health. In contrast, neither the provision of benefits and services, nor the satisfaction with organizational culture was significantly associated with the mental health of national staff in the research undertaken by Ager et al. [17]. Some studies examined coping strategies, again with diverging results: Eriksson et al. [19] found avoidance coping to be positively associated with depression, anxiety, and PTSD in their study on pre-deployment mental health and trauma exposure of expatriate humanitarian workers. The results from Lopes Cardozo et al. [22] do not support the theory that avoidant coping presents a risk factor

5

78 for PTSD among national staff. Few studies analysed the potential effects of healthy lifestyle

79 habits (e.g., healthy eating, caffeeine intake, exercising) on humanitarian workers' mental

80 health [19,26][19,26]. While neither of these studies found a significant association between

81 this predictor and mental health outcomes, the wider literature on humanitarian workers

82 emphasizes the importance of healthy lifestyle habits in this context (e.g., [28,29][e.g.,

83 28,29]). Another construct that has gained recent attention in relation to coping is spiritual

84 transcendence (e.g., [30,31][e.g., 30,31]). However, quantitative research on its relation with

85 the mental health of humanitarian workers has to our knowledge not yet been undertaken.

86   If mental health problems manifest, they come with serious implications for the

87 individual's personal and professional life [32][32]. Humanitarian workers themselves have

88 increasingly spoken out on problems and voiced their urgent need for help (e.g. through

89 public forums such as the Facebook group "Fifty Shades of Aid" and the "Secret Aid Worker"

90 series published by The Guardian (e.g., [33,34][e.g., 33,34]). Humanitarian organizations

91 have taken note of the problem, and increasingly understand compromised mental health of

92 their workforce as an issue that impacts negatively on organizational functioning; they have

93 the obligation to prevent and address mental health problems among their staff, ensure their

94 well-being and sustain organizational effectiveness and efficiency [35,36][35,36]. While

95 these are desirable developments, major barriers in establishing new and adjusting existing

96 staff support services and policies based on needs are the limited availability of evidence-

97 based data and diverse findings on factors shaping the mental health of humanitarian

98 workers: crisis settings differ greatly and staff support is most effective when tailored to the

99 specific context [29][29]. Staff support is largely insufficient and underfunded and

100 awareness building among donors is needed to ensure appropriate allocation of funds [37][37].

101 This is also acutely the case for South Sudan where humanitarian workers face a unique crisis

[38][38], staff support is in need of improvement [39][39], and, to the best of our knowledge, no

scientific research on the mental health of humanitarian workers (national and international

staff, consultants, United Nations [UN] Volunteers) has previously been undertaken.

The distinction between national and international staff is commonly made in the

humanitarian field on the basis of differences in contract modalities (e.g. access to security

support), the nature of work undertaken (e.g. deployment in high-risk contexts), and the

level of dependency on jobs in the sector to sustain livelihoods [40][40]. This has resulted in

the majority of research in this field to date focusing on either national or international staff

[16,21][16,21]. However, national and international staff also have many commonalities in

their experience. The motives of both groups have been shown to reflect a complex

combination of sense of challenge, humanitarian conviction, and personal interest, such as

career advancement [41][41]. Issues of family adjustment and separation are reported by

both national and international staff [42][42]. Clearly, humanitarian operations depend on

the deployment of both within and integrated workforces. With differential treatment and

expectation a noted source of resentment [43][43], this study applied an inclusive approach

and explicitly sought to engage the humanitarian community in South Sudan as a whole.

Further, our analysis did not presume being contracted as national or international staff to

represent a basis for a priori separation of the sample into two distinct populations. Rather,

as with a recent UNHCR study [44][44] on staff well-being, we saw this as one of a number

of variables to be included in statistical analysis.

Study objectives and hypotheses

7

125 Our study addresses the gap in research on the mental health of humanitarian workers in
126 South Sudan through analyses of cross-sectional online survey data. Specifically, we aimed at
127 establishing the symptom burden of five mental health outcomes – PTSD, depression, anxiety,
128 hazardous alcohol consumption, and burnout – among this occupation group. We also aimed
129 at fitting models with high predictive accuracy to assess relationships between predictor
130 variables and mental health outcomes.

131 The Job Demands-Resources (JDR) model is a comprehensive and highly flexible
132 model that is widely used to assess employee health, especially in the context of cross-
133 sectional research [45,46][45,46]. It assumes that employee health results from a balance of
134 negative job characteristics (demands) and positive job and personal characteristics
135 (resources) [46][46]. Based on the JDR, job demands included in our models should be
136 significantly positively related with the mental health outcomes under examination. Job and
137 personal resources should be significantly negatively related with these.

138

139

Methods

Procedure and participants

142 One hundred forty-five humanitarian organizations were identified based on their
143 participation in the 2017 South Sudan Humanitarian Response Plan and/or membership in
144 the 2017 Humanitarian Country Team. Based on the availability of contact details, 124
145 organizations were contacted by email in April 2017 and requested to support an online
146 survey. This support entailed designating a focal point within the organization who liaised
147 with the researchers and disseminated the survey link, relevant information and two

148 reminder emails to the workforce. To be included in the survey, organizations were required

149 to have 10 or more staff employed in South Sudan and to have operated in the country for

150 one year or longer. Those eligible for survey participation were national and international

151 staff, consultants and UN Volunteers from supporting organizations whose official duty

152 station was located in South Sudan.

153   The online survey was constructed in English (the working language in South Sudan),

154 pilot tested on humanitarian workers with work experience in South Sudan and/or other

155 major humanitarian crises, and adjusted based on the feedback received. The survey took

156 approximately 45 minutes to complete, was launched in May 2017 and open for completion

157 for one month.

158

Ethical considerations

160 The study protocol was reviewed and approved by the Research Ethics Committee of Queen

161 Margaret University, Edinburgh. Approval was granted on the basis of employing

162 organizations being required to grant written permission following review of study goals and

163 methods as outlined in the study information sheet. Informed consent was obtained from all

164 survey participants. Given that the study involved surveying employees (rather than

165 patients) and no personal identifying information, and given the evidence of the lack of a

166 currently functioning national research ethics committee [47][47], this was considered the

167 most appropriate means of securing necessary local approval consistent with country

168 regulations.

169

170

Field Code Changed

Measures

Mental health outcomes

We measured five common mental health outcomes: PTSD, depression, anxiety, hazardous alcohol consumption, and burnout. The validity and reliablity of the tools used to measure these outcomes were established in many countries and occupation groups (e.g., [48-51][e.g., 48,49-51]).

PTSD symptoms: We used the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) to measure PTSD symptoms [52][52]. The PCL-5 consists of a list of 20 problems (α = .93) and requires participants to rank how much they have been bothered by these in the past month on a five-point Likert scale ranging from 0 ('not at all') to 4 ('extremely'). The established cutoff for provisional PTSD diagnosis established with PCL-5 is 33 [52][52].

Depression/anxiety: The Hopkins Symptoms Checklist-25 (HSCL-25) was used. This tool comprises symptoms of strain that people sometimes have, whereby 10 items focus on anxiety (α = .92), and 15 items on depression (α = .92) as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) [53][53]. Participants rate how much each symptom has bothered them in the last month on a four-point Likert scale ranging from 1 ('not at all') to 4 ('extremely'). Mean scores of 1.75 and higher on the HSCL-25 are commonly recognized as predictive of clinical risk for depression and anxiety [54][54].

Hazardous alcohol consumption: This was measured with the Alcohol Use Disorder Identification Test for Consumption (Audit-C) [55][55]. This brief three-item alcohol screen focuses on the frequency and quantity of alcohol consumption (α = .64). Audit-C test scores

193   of 3 or more for women and 4 or more for men are considered positive, indicating a height-

194   ened risk for hazardous drinking/alcohol use disorder [56][56].

195   Burnout: We adopted the Maslach Burnout Index Human Services Survey [57][57]. Through

196   a seven-point Likert scale, participants indicate how often they have job-related feelings re-

197   lated to emotional exhaustion (EE) (α = .85) and depersonalization (DP) (α = .83). Established

198   cutoffs for high levels of burnout are 27 points and above on the EE subscale, and 13 points

199   and above on the DP subscale [57][57]. We excluded from analysis the responses for the sub-

200   scale of personal accomplishment (PA), due to its marginal internal consistency as shown by

201   Cronbach's alpha (α = .67) and due to its marginal relevance to the burnout syndrome [58][58].

202

Predictor variables

204   We collected data on socio-demographic characteristics and nine main constructs based on

205   their relevance in previous research on the mental health of humanitarian workers [17-

206   20,22,24,26][17-20,22,24,26]. These are stress levels and trauma exposure (job demands);

207   perceived organizational work experience, organizational support, team cohesion (job re-

208   sources); and perceived social support, spiritual transcendence, coping, and health habits

209   (personal resources).

210   Stress Levels: These were measured through a list of 18 chronic stressors. Based on Ager et

211   al. [17][17] and adjusted to cover stressors specific to the South Sudan context, these include

212   'uncertainty about political stability', 'traffic difficulties', 'excessive heat', and 'separation

213   from close relatives'. Participants reported if they are currently experiencing these stressors,

214   and the levels of stress each item currently causes them on a scale ranging from 0 ('no stress')

215 to 4 ('extreme stress'). A continuous variable was computed to reflect participants' overall

216 exposure to chronic stress.

217 Trauma Exposure: We assessed this through a list of 25 traumatic events based on the Har-

218 vard Trauma Questionnaire [59][59] and adjusted by covering events specific to the South Sudan

219 context. This list included events such as 'being expelled from the country', 'being shot at',

220 'serious road/vehicle accident', and 'unexpected or premature death of family member or

221 colleague'. Participants indicated if they have witnessed, experienced, or not been exposed

222 to these events in the past 10 years. The number of traumatic events witnessed and experi-

223 enced was summed up to a composite score of trauma exposure ranging from 0 to 25.

224 Organizational Work Experience: Taken from previous work by Ager et al. [17][17], four six-

225 point scale items ranging from 1 ('strongly disagree') to 6 ('strongly agree') were used to

226 assess participants' perceptions of work within their organization. Examples are 'my organi-

227 zation encourages me to take vacation and sick leave', and 'my organization helps to manage

228 team conflicts effectively' (α = .72).

229 Organizational Support: We used two sets of questions from Ager et al. [17][17] and adjusted

230 these to match the South Sudan context: The first set asked about the provision of 14 support

231 items and benefits, such as communication equipment and health insurance. The second set

232 asked about the provision of briefings and trainings on 11 topics, including stress manage-

233 ment and security risks and protocols. Two composite scores were calculated reflecting the

234 total sum of items and benefits, and trainings and briefings received.

235 Team Cohesion: Two scales were established to assess relationships among co-workers and

236 with management based on four and six 5-point Likert scale questions, respectively [60][60].

237 While the items on team cohesion among co-workers (α = .84) focused on aspects such as

238 spending time together outside office hours and considering colleagues friends, team

12

239   cohesion with management (α = .86) addressed topics such as micromanagement and

240   interest in personal welfare. Scores on these scales ranged from 5-20 and 5-30.

241   Social Support: The selection of 12 4-point Likert scale questions extracted from the Social

242   Provisions Scale used by Ager et al. [17][17] was adopted. Ranging from 1 ('strongly

243   disagree') to 4 ('strongly agree'), a composite score was computed reflecting participants'

244   perceived social support (α = .80).

245   Spiritual Transcendence: We took four questions from the Spiritual Transcendence Index de-

246   veloped by Seidlitz et al. [61][61] to measure this concept. Participants indicated whether they

247   are religious and/or spiritual and their level of agreement with statements such as 'my spir-

248   ituality gives me a feeling of fulfillment', and 'I experience a deep communication with God',

249   with 1 indicating 'strong disagreement' and 6 'strong agreement' (α = .96).

250   Coping: The Brief COPE was used to assess coping strategies as suggested by Cooper et al.

251   [62][62]. These are emotion-focused strategies (α = .78), problem-focused strategies (α =

252   .81), and dysfunctional strategies (α = .80). The Brief COPE has been validated in many

253   cross-cultural settings (e.g., [63,64][e.g., 63,64]).

254   Health Habits: A health habits index was created based on previous work by Eriksson et al.

255   [19][19] and adjusted to the study at hand (i.e., items accounted for by other measures were

256   excluded from this index to avoid duplication). This index summed positive responses for the

257   following four items: consuming 10 or more servings of fruits, vegetables or their juices per

258   week; less than seven servings of junk food per week; less than two servings of caffeinated

259   beverages per day; and engaging in physical exercise three times or more per week. The score

260   for this index ranged from 0-4.

261

262

Data analysis

264 To select predictors with the highest predictive power, we applied Least Absolute Shrinkage

265 and Selection Operator (LASSO) regression. LASSO is a type of machine learning that per-

266 forms more stable and accurate variable selection than other commonly used methods, such

267 as best subset selection, forward selection, backward elimination, and stepwise regression;

268 it is the superior alternative [65-67][65-67]. LASSO is especially suitable for large p small n

269 datasets [68][68] and selects fewer noise predictors than commonly used variable selection

270 methods [69][69]. Given its unique features, LASSO is increasingly applied in mental health

271 research, for instance on PTSD [70][70] and substance use [71][71].

272   As required for LASSO, we established six sub-sets of data, each including complete

273 cases of one mental health outcome and all predictor variables. We randomly split these into

274 training and test sets (50:50). Models for each mental health outcome were trained on the

275 respective training set. To assess performance regarding prediction accuracy, we calculated

276 mean squared errors (MSEs) for these models on the test sets. The MSEs of all sparse models

277 established through LASSO were smaller than those of the models including all predictor var-

278 iables. This confirms their better performance regarding prediction accuracy. To obtain final

279 coefficients and perform inference we then ran linear regression analyses ('OLS post LASSO')

280 on each data sub-set with the predictors selected through LASSO [72,73][72,73]. Regression

281 analyses were undertaken with the package "glmnet" in R 1.0.143.

282

283

284

14

Results

Survey participation

Forty-five organizations out of the 124 that were contacted confirmed their willingness to support of the survey. This included 21 national NGOs (NNGOs), 20 international NGOs (IN-GOs) and 4 UN entities, all of which fulfilled the eligibility criteria. One organization clarified being currently inactive in South Sudan, one anticipated being denied funding through the HRP, four declined the request, and 73 did not respond.

Based on information received from supporting organizations, the number of humanitarian workers who had access to the survey was estimated to be between 2672 and 3238. A total of 277 humanitarian workers completed the survey (a response rate in the order of 10%). This rate is in line with comparable research undertaken through online surveys in conflict-affected states (e.g., [74][e.g., 74]) and the estimated average response rate for external online surveys [75][75].

About three quarters of survey participants were male (78%). Approaching half (48%) of participants were aged between 30-39 and 40% had a Bachelor degree as their highest level of education. A slight majority of participants were based in Juba (54%), classified themselves as national staff (52%), and were employed by INGOs (64%). Thirty-five per cent of participants worked as Managers/Coordinators, the largest job category for those completing the survey. These and further socio-demographic characteristics are presented in Table 1.

Table 1: Socio-demographic characteristics of the cohort.

Variable	N	%

15

Duty station			
	Capital (Juba)	149	53.8
	Field	128	46.2
Gender			
	Female	61	22.0
	Male	216	78.0
Age			
	<30	51	18.4
	30-39	134	48.4
	40-49	67	24.2
	50+	25	8.1
Civil status			
	Single/separated/divorced/widowed	52	18.8
	In a committed relationship/married	223	80.5
Level of education			
	Secondary school / High school	19	6.9
	Higher vocational education/technical training	41	14.8
	University (BA)	112	40.4
	Postgraduate (MA, MSc, PhD)	105	37.9
Type of organization			
	National NGO	58	20.9
	International NGO	176	63.5
	UN entity	41	14.8
	Other	2	0.7
Contract type			
	National staff	144	52.0
	International staff	119	43.0
	Consultant	9	3.3
	UN Volunteer	5	1.8
Job function			
	Country Director / Head of Mission	18	6.5
	Manager/Coordinator (Programme or Operations)	96	34.7
	Technical/Programme	63	22.7
	Logistics	12	4.3
	Administrative	21	7.6
	Human Resources	15	4.3
	Other	52	18.8
Working directly with beneficiaries			
	No	93	33.6
	Yes	184	66.4
Previous humanitarian field assignments			
	10 or more	25	9.0
	5-9	49	17.7
	2-4	130	46.9
	1	46	9.7
	None	27	9.7
Years spent in South Sudan as humanitarian worker			

<1	39	14.1
1-2	41	14.8
2-3	42	15.2
3-4	27	9.7
4-5	23	8.3
5-6	23	8.3
>6	82	29.6

Mental health history (received counseling or medication for emotional problem)

No	225	81.2
Yes	46	16.6

Note: Effective n ranges from 271 to 277.

Chronic stress exposure

Participants were exposed to chronic stress; the average number of chronic stressors experienced was 16.31 (SD = 3.47), and the overall mean score on the stress level scale was 29.37 (SD = 14.04). The three stressors most frequently identified by participants as causing extreme stress related to the uncertainty about the political stability in the country (41%); travel difficulties, restrictions on movements, threatening checkpoints, and rough roads (38%); and the separation from close relatives due to work responsibilities (23%) (Table 2).

Table 2: Percentage of participants reporting extreme stress

Stressors	%
Uncertainty about the political stability	40.9
Travel difficulties, restrictions on movements, threatening checkpoints, rough roads	37.9
Separation from close relatives due to work responsibilities	22.9
Armed security, needing to have armed guards at work or living place	18.8
Feeling powerless to change the situation of the beneficiary community	16.5
Excessive heat, cold, or noise	15.9
Economic/financial problem	15.5
Workload expected by organization is too high	14.5

17

Feeling powerless to change one's own situation	13.9
Feeling hostility from others due to one's affiliation to a certain group (e.g. tribe, nationality, religion)	13.8
Lack of recognition from organization management for work accomplishment	13.1
Tension due to expatriate and national staff not treated equally by organization management	11.6
Being asked to perform duties that are outside of one's professional training or terms of reference	11.3
Lack of recognition from the beneficiary community for work accomplished	8.8
Conflicts or misunderstandings between co-workers	7.9
Criticism of work by media or beneficiary community members	7.2
Lack of direction from organizational management	6.5
Criticism of work by organization management	5.1

Effective n ranges from 273-277.

Coping strategies

Cooper et al. [62][62] established three coping strategies: emotion focused coping, involving the use of emotional support, positive reframing, acceptance, religion, and humor; problem focused coping, involving active coping, planning, and use of instrumental support; and dysfunctional coping, involving venting, denial, substance use, behavioral disengagement, self-distraction, and self-blame. Table 3 shows coping strategy mean scores of survey participants.

Table 3: Coping strategy

Coping strategy	M	SD	Range
Emotion focused	25.23	5.99	10-40
Problem focused	17.39	4.20	6-24
Dysfunctional	23.19	6.35	12-48

Field Code Changed

18

331 M = mean; SD = standard deviation. Effective n ranges from 253-261.
332
333
334

Mental health outcomes

Applying the established cutoff for provisional PTSD diagnosis, 24% of all survey participants experienced symptoms indicative of high risk of post-traumatic stress. Disaggregated by contract type, 36% of national and 13% of international staff met symptom thresholds associated with a diagnosis of PTSD; this difference was significant [χ^2 (1, N=231) = 16.51, p < .001].

Just over one-third (39%) of survey participants scored at or above the established cutoff suggestive of depression, and 38% scored at or above the cutoff suggestive of anxiety disorder. We found a higher proportion of national staff meeting symptom thresholds associated with disorder than international staff: for the former 45% and 52% reached scores suggestive of depression and anxiety disorder, respectively; for the latter 35% and 24% reached these thresholds. While no significant association was found between contract type (national/international staff) and provisional depression diagnosis [χ^2 (1, N=244) = 2.62, p = .11], the association between contract type (national/international staff) and anxiety disorder was significant [χ^2 (1, N=247) = 20.65, p < .001].

A third of both female (36%) and male (35%) participants reached positive Audit-C test scores. Prevalence of reported hazardous drinking/alcohol use disorder was significantly higher amongst male international staff than male national staff [χ^2 (1, N=205) = 13.68, p < .001]: Twenty-five percent of male national staff and 50% of male international staff reached Audit-C thresholds. Amongst women there was a similar trend, with 21% of female national staff and 41% of female international staff reporting drinking at levels suggestive of disorder. However, this difference was not significant [χ^2 (1, N=58) = 2.27, p = .13].

19

356   Based on the established cutoffs, 24% of all survey participants fulfilled the criteria

357   for high burnout on the EE sub-scale, and 19% on the DP sub-scale. International staff re-

358   ported higher rates of difficulty than national staff: 29% and 23% of international staff

359   reached scores suggestive of burnout case on the EE and DP sub-scales respectively com-

360   pared with 19% and 18% of national staff on these same sub-scales. The associations be-

361   tween contract type (national/international staff) and EE [χ^2 (1, N=237) = 3.72, p = .05] and

362   contract type (national/international staff) and DP [χ^2 (1, N=250) = 1.03, p = .31] were not

363   significant.

364

Regression analyses

366   Higher levels of chronic stress (p<.001) and trauma exposure (p<.01) were risk factors for

367   PTSD, with those participants experiencing higher levels of stress and trauma being signifi-

368   cantly more likely to report PTSD symptoms.

369   Dysfunctional coping was significantly positively associated with depression

370   (p<.001). Further, participants experiencing higher levels of chronic stress were significantly

371   more likely to experience symptoms of depression than those who felt less stressed (p<.001).

372   The risk for anxiety increased with being a woman (p<.05). The number of years spent

373   in South Sudan as humanitarian worker was significantly positively associated with anxiety

374   symptomatology (p<.05). Anxiety was also significantly positively related with dysfunctional

375   coping (p<.01) and exposure to stress (p<.001).

376   Hazardous alcohol consumption was significantly associated with duty station

377   (p<.01); humanitarian workers based in the capital were at greater risk of engaging in haz-

378   ardous drinking than those based in the field. Spiritual transcendence was negatively related

379   to hazardous alcohol consumption (p<.001) (Table 4).

380

Table 4: Linear regression models for PTSD, depression, anxiety, and hazardous alcohol consumption

Outcome	PTSD (n= 105)		Depression (n= 108)		Anxiety (n= 109)		Hazardous alcohol consumption (n= 111)	
Predictors	B	SE	B	SE	B	SE	B	SE
Gender					-0.16*	0.08	0.15	0.08
Duty station							-0.22*	0.08
Years in South Sudan					0.18*	0.08		
Mental health history					-0.02	0.08	0.14	0.08
Spiritual transcendence							-0.32***	0.09
Perceived social support					-0.15	0.09	0.02	0.09
Organizational support – benefits/ items							0.21	0.09
Team cohesion - management							0.01	0.09
Organizational work experience					0.08	0.08		
Coping – problem focused					0.06	0.09		
Coping – dysfunctional			0.37***	0.07	0.28**	0.09	0.14	0.08
Chronic stress	0.48***	0.08	0.52***	0.07	0.34***	0.08		
Trauma exposure	0.29***	0.08			0.16	0.09		

PTSD = Posttraumatic Stress Disorder; Years in South Sudan = Years spent in South Sudan as humanitarian worker; PTSD adjusted R^2 = .39; Depression adjusted R^2 = .46; Anxiety adjusted R^2 = .36; Hazardous alcohol consumption adjusted R^2 = .31; *p <.05; **p < .01; ***p< .001; B = standardized beta; An additional 12 predictors were included in LASSO regressions but had coefficients of zero for all outcomes. These predictors are age, education, civil status, contract type, organization

type, job function, number of previous humanitarian field assignments, working directly with ben-eficiaries, coping – emotion focused, organizational support – trainings/briefings, team cohesion – co-workers, and health habits.

381

382   In terms of burnout (Table 5), working directly with beneficiaries was associated with

383   lower levels of EE (p<.01), while greater risk of EE was associated with higher levels of

384   chronic stress (p<.01). Higher scores on DP were associated with chronic stress (p<.001).

385   While higher levels of team cohesion with co-workers were associated with lower levels of

386   DP (p<.05), higher levels of team cohesion with management were associated with higher

387   levels of DP (p<.05).

388

Table 5: Linear regression models for burnout

Outcome	Emotional exhaustion (n= 104)		Depersonalization (n= 108)	
Predictors	**B**	**SE**	**B**	**SE**
Education	0.06	0.09	-0.15	0.10
Civil status	-0.05	0.09		
Contract type			0.14	0.09
Organization type	-0.16	0.09		
Duty station			0.03	0.10
Working directly with beneficiaries	-0.26**	0.09	-0.15	0.10
Mental health history			0.04	0.09
Spiritual transcendence	-0.18	0.10		
Perceived social support	-0.08	0.09		
Organizational support – trainings/ briefings	-0.15	0.09		
Organizational work experience	-0.07	0.10		
Team cohesion – co-workers			-0.21*	0.09
Team cohesion – management			0.20*	0.09
Coping – dysfunctional	0.11	0.09		
Chronic stress	0.30**	0.09	0.39***	0.10
Trauma exposure			0.18	0.10

EE adjusted R^2 = .27; DP adjusted R^2 = .20; *p <.05; **p < .01; ***p< .001; B = standardized beta; An additional nine predictors were included in LASSO regressions but had coefficients of zero for all outcomes. These predictors are gender, age, job function, number of previous humanitarian field assignments, years spent in South Sudan as humanitarian worker, organizational support – benefits/ items, coping – problem focused, coping – emotion focused, and health habits.

Discussion

Symptom burden of mental health outcomes

Our results suggest that humanitarian workers in South Sudan experience substantial levels of symptom burden of PTSD, depression, anxiety, hazardous alcohol consumption and burnout. Differences in the prevalence rates established for national and international staff were significant only for PTSD, anxiety, and hazardous alcohol consumption among male staff.

It is challenging to identify reference groups for meaningful comparison of the established prevalence rates. Further, comparing health measures across groups within a society and across different societies is – as well-known – problematic [76][76]. Nonetheless, the prevalence of symptoms indicative of high risk of post-traumatic stress we found among national staff (36%) is higher than the rates for mild or moderate forms of PTSD among South Sudanese refugees in northern Uganda (15-20%) [77][77]. It is lower than the prevalence consistent with PTSD diagnosis found among civilians from multiple locations across South Sudan (41%) [78][78]. The prevalence we found (36%) is also lower than that found among respondents based in Malakal Protection of Civilians side (53%) [78][78]. The proportion of South Sudanese national staff reaching scores above thresholds for anxiety (52%) is as high as that of Ugandan national staff operating in neighboring Gulu assessed with the same tool (53%) [17][17].

23

Regarding international staff, the prevalence rates we found for PTSD and anxiety generally exceed those of western adult populations [79-81][79-81]. Likewise, they exceed the proportion of expatriate humanitarian workers in Kosovo who scored above cutoffs for PTSD (13% and 1% respectively) and anxiety (24% and 9% respectively) [20][20]. The anxiety prevalence we found among international staff based in South Sudan also exceeds the rate established by Cardozo et al. [26][26] for post-deployment anxiety (12%) among humanitarian workers across countries.

Few studies looked at alcohol consumption. The recent study by Jachens, Houdmont and Thomas [23][23] investigated alcohol consumption among humanitarian workers, including national and international staff. Using the same measure that we used, this study found that 18% of all female and 10% of all male participants engaged in hazardous drinking [23][23]. Lopes Cardozo et al. [20][20] report prevalence of hazardous alcohol consumption for national and international staff (3% and 16% respectively) but neglect disaggregation by gender. The prevalence rates we found among female humanitarian workers in South Sudan and male national and international staff (36%, 25% and 50% respectively) all exceed the rates established by these studies.

Trauma and chronic stress exposure

Although experience of traumatic events was associated with higher reportage of symptoms of PTSD, it was chronic stress that was most consistently associated with mental health problems. This confirms our hypothesis from consideration of the JDR model that job demands are significantly positively associated with mental health problems. Our finding is

430   in line with results from other research on the impact of stress versus major life events in

431   adult population samples [82][82]. It also reinforces the results of previous work that emphasizes

432   the cumulative effect of daily stress in contexts of conflict and instability [12,17,19][12,17,19]. Previous

433   research on humanitarian workers' mental health has a strong concentration on trauma ex-

434   posure (and PTSD as the corresponding "signature" disorder) (e.g., [20,21,83][e.g., 20,21,83]). Future stud-

435   ies should consider integrating an increased focus on the effects of chronic stress.

436   Exposure to traumatic events and especially chronic stress is inevitably a characteris-

437   tic of the operating environments of humanitarian workers. Nevertheless, there is a clear case

438   for preventive measures addressing security and work conditions on the basis of our finding.

439   With regards to South Sudan, developing and disseminating thorough security and evacua-

440   tion protocols and re-confirming with staff that they are covered in case of need is one rem-

441   edy that may help mitigate top-ranked stressors such as uncertainty about the political sta-

442   bility. Investments in comprehensive briefings prior to deployment on the implications of

443   humanitarian work on staff's personal life, and in staff support services that promote work-

444   life balance (e.g., rest and recuperation) may help address stress caused by family separation

445   and high workloads.

446

Coping and spiritual transcendence

448   Surprisingly, we found no significant association between emotion focused and problem fo-

449   cused coping strategies and mental illness. This is contrary to expectations from studies with

450   other population groups using the same measure that found significant relationships be-

451   tween one or both coping strategies and depression or anxiety [84,85][84,85]. The positive relation-

452   ship we found between dysfunctional coping and depression and anxiety is in line with these

25

studies [62,86]. Specifically with expatriate humanitarian workers, Eriksson et al. found a significant positive association between avoidant coping and PTSD, anxiety, and depression. Lopez Cardozo et al. [22] found using an avoidant coping style significantly associated with more anxiety among national humanitarian workers. These findings suggest potential for addressing coping strategies adopted by humanitarian workers. However, establishing appropriate, protective forms of coping in humanitarian settings may be challenging. Coping strategies in situations of conflict may, as suggested by recent work in conflict-affected populations [87], require distinct adaptation to be effective.

We found the concept of spiritual transcendence [88] to be negatively associated with hazardous alcohol consumption, indicating that humanitarian workers with higher spirituality are less likely to engage in such harmful behavior. This finding matches outcomes from similar occupation groups [89]. Our hypothesis that personal resources are significantly negatively associated with mental health problems holds for this construct.

Team cohesion and working with beneficiaries

The association of higher levels of team cohesion with co-workers with lower levels of depersonalization reinforces the value of establishing effective team working in high-stress environment suggested in other work (e.g., [17]). However, it was unexpected that higher team cohesion with management was associated with higher rather than lower levels of depersonalization. A possible explanation is that in the humanitarian worker sample at hand, depersonalization was most prevalent among Managers/Coordinators. It is well known that burnout has a spillover effect and aspects associated with depersonalization, such as pessimistic attitudes towards beneficiaries, can spread from managers to team members [90]. Our

26

476 hypothesis derived from the JDR model that job resources are negatively associated with

477 mental health problems is thus partially fulfilled.

478

Socio-demographic factors

480 The observation that working directly with humanitarian aid beneficiaries was associated

481 with lower not higher levels of emotional exhaustion points to the stresses in this environ-

482 ment associated with managerial and coordination functions, too. The fact that duty station

483 was associated with hazardous alcohol consumption can most readily be attributed to the

484 fact that Juba – the capital – provided far easier physical and social access to alcoholic bever-

485 ages (e.g. [91][eg, 91]). On the basis of studies in other humanitarian settings (e.g. [17,19,20,92][eg, 17,19,20,92]),

486 we had anticipated further socio-demographic characteristics to explain variance in the men-

487 tal health outcomes. However, while this study found some of the differences in the estab-

488 lished prevalence rates for national and international staff to be significant during bivariate

489 analyses, contract type was not a significant predictor during multiple regression analyses.

490 Risk factors for common mental health problems specific to gender, especially gender-based

491 violence and sexual harassment, are widespread within humanitarian communities (e.g.

492 [93,94][e.g., 93,94]), yet gender was only significantly associated with anxiety. In light of this and previ-

493 ous studies with humanitarian workers that have been inconstant in their findings regarding

494 gender differences (e.g. [17][e.g., 17]), we are especially interested in rates of reported mental ill-

495 health between men and women. In the absence of such findings, the factors that influence

496 the relationship between gender and mental health among humanitarian workers remains

497 unclear [16][16].

498

27

Limitations

This study has four main limitations. Firstly, the cross-sectional survey design does not provide a basis for establishing cause-effect relationships. Secondly, we could not conduct clinical interviews to establish psychiatric diagnosis. Instead, we used screening tools that have exhibited strong psychometric properties in many settings and have been shown to be suggestive of rates of clinical disorder (e.g., [48-51][e.g., 48,49-51]). Thirdly, our sample may not be fully representative of the humanitarian community in South Sudan. Although data on the composition of the humanitarian community in South Sudan are scarce, recent estimates suggest that national staff make up 92% of the NGO staffing [95][95], in line with the global estimate of 90% of the humanitarian workforce in field locations [40][40]. By contrast, our sample comprises of 52% national and 43% international staff. However, our sample reflected the humanitarian community well in other regards, such as the greater proportion of male humanitarian workers and level of education: men made up the majority of the sample and most had a University degree, in line with related studies on humanitarian workers (e.g., [20,21,24][e.g., 20,21,24]). Lastly, the low survey response rate clearly raises cautions regarding the generalizability of the study results, and further research is required to confirm our findings. Organizations repeatedly identified limited Internet access as a hurdle, especially for field-based staff. The English language in which the survey was conducted may have presented an additional barrier for participation for some staff. However, the response rate is well in line with response rates typically received by online surveys [75,96][75,96].

Conclusion

28

521   Our results suggest that humanitarian workers in South Sudan experience substantial rates
522   of mental health problems. This study highlights that chronic stress plays a dominant role in
523   understanding mental health problems. It points to the need for organizational staff support
524   strategies that mitigate humanitarian workers' chronic stress exposure. Dysfunctional cop-
525   ing was associated with higher risk for mental disorder, indicating an important role for ed-
526   ucation of humanitarian workers regarding stress management. However, strategies that
527   may be adaptive in other contexts may not be effective in high stress environments such as
528   that studied here.

529

Acknowledgements

29

References

1. UN Meetings Coverage and Press Releases (2017) Security Council presidential statement urges greater humanitarian access to famine-threatened Yemen, South Sudan, Somalia, Nigeria.
2. UN News Center (2017) UN aid chief urges global action as starvation, famine loom for 20 million across four countries. UN News Center.
3. UNOCHA South Sudan (2016) 2017 Humanitarian needs overview. n.p.: UNOCHA.
4. Humanitarian Outcomes (2016) Aid worker security report: Figures at a glance. n.p.
5. Stoddard A, Harmer A, Czwarno M (2017) Aid worker security report 2017: Behind the attacks. A look at the perpetrators of violence against aid workers. n.p.: Humanitarian outcomes.
6. Humanitarian Outcomes (2016) Aid worker security report 2015: Figures at a glance. London.
7. Humanitarian Outcomes (2017) Aid worker security report 2016: Figures at a glance. London.
8. Deutsche Welle (2016) Embassies evacuate as violence worsens in South Sudan. Deutsche Welle.
9. Dumo D (2017) South Sudan soldiers accused of rape, murder of aid workers appear in court. World News: Reuters.
10. UNOCHA (2018) South Sudan: Aid workers freed, humanitarian deaths reach 100 since December 2013. Reliefweb.
11. Brady K, Killeen T, Brewerton T, Lucerini S (2000) Comorbidity of psychiatric disorders and posttraumatic stress disorder. Journal of Clinical Psychiatry 61: 22-32.
12. Miller KE, Rasmussen A (2010) War exposure, daily stressors, and mental health in conflict and post-conflict settings: Bridging the divide between trauma-focused and psychosocial frameworks. Social Science & Medicine 70: 7-16.
13. Collins PY, Patel V, Joestl SS, March D, Insel TR, et al. (2011) Grand challenges in global mental health. Nature 475: 27-30.
14. Maslach C, Jackson SE, Leitner M (1997) Maslach Burnout Inventory Manual. Palo Alto: Consulting Psychologists Press.
15. McKay L (2011) Resilience: Building resilient managers in humanitarian organizations. Strenghtening key organizational structures and personal skills that promote resilience in challenging environments. n.p.: People in Aid.
16. Strohmeier H, Scholte WF (2015) Trauma-related mental health problems among national humanitarian staff: A systematic review of the literature. European Journal of Psychotraumatology 6.
17. Ager A, Pasha E, Yu G, Duke T, Eriksson C, et al. (2012) Stress, mental health, and burnout in national humanitarian aid workers in Gulu, Northern Uganda. Journal of Traumatic Stress 25: 713-720.
18. Eriksson CB, Lopes Cardozo B, Ghitis F, Sabin ME, Gotway Crawford CA, et al. (2013) Factors associated with adverse mental health outcomes in locally recruited aid workers assisting Iraqi refugees in Jordan. Journal of Aggression, Maltreatment and Trauma 22: 660-680.

19. Eriksson CB, Lopes Cardozo B, Foy DW, Sabin M, Ager A, et al. (2012) Predeployment mental health and trauma exposure of expatriate humanitarian aid workers: Risk and resilience factors. Traumatology 19: 41-48.
20. Lopes Cardozo B, Holtz TH, Kaiser R, Gotway CA, Ghitis F, et al. (2005) The mental health of expatriate and Kosovar Albanian humanitarian aid workers. Disasters 29: 152-170.
21. Connorton E, Perry MJ, Hemenway D, Miller M (2012) Humanitarian relief work and trauma-related mental illness. Epidemiological Reviews 34: 145-155.
22. Lopes Cardozo B, Sivilli TI, Crawford CA, Scholte WF, Petit P, et al. (2013) Factors affecting mental health of local staff working in the Vanni region, Sri Lanka. Psychological Trauma: Theory, Research, Practice, and Policy 5: 581-590.
23. Jachens L, Houdmont J, Thomas R (2016) Effort–Reward Imbalance and Heavy Alcohol Consumption Among Humanitarian Aid Workers. Journal of Studies on Alcohol and Drugs 77: 904–913.
24. Eriksson CB, Kemp HV, Richard Gorsuch, Hoke S, Foy DW (2001) Trauma Exposure and PTSD Symptoms in International Relief and Development Personnel. Journal of Traumatic Stress 14: 205-212.
25. Musa SA, Hamid AARM (2008) Psychological problems among aid workers operating in Darfur. Social Behaviour and Personality: An International Journal 36: 407-416.
26. Lopes-Cardozo B, Gotway-Crawford C, Eriksson C, Zhu J, Sabin M, et al. (2012) Psychological distress, depression, anxiety, and burnout among international humanitarian aid workers: A longitudinal study Plos One 7.
27. Eriksson CB, Bjorck JP, Larson LC, Walling SM, Trice GA, 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: 671–686.
28. Surya M, Jaff D, Stilwell B, Schubert J (2017) The importance of mental well-being for health professionals during complex emergencies: It is time we take it seriously. Global Health: Science and Practice 5: 188-196.
29. Antares Foundation (2012) Managing stress in humanitarian workers: Guidelines for good practice. Amsterdam.
30. Schafer A (2010) Spirituality and mental health in humanitarian contexts: an exploration based on World Vision's Haiti earthquake response. Intervention 8: 121 - 130.
31. Eriksson C, Holland J, Currier J, Snider L, Ager A, et al. (2014) Trajectories of spiritual change among expatriate humanitarian aid workers: A prospective longitudinal study. Psychology of Religion and Spirituality 7: 13-23.
32. Brunello N, Davidson JRT, Deahl M, Kessler RC, Mendlewicz J, et al. (2001) Posttraumatic stress disorder: Diagnosis and epidemiology, comorbidity and social consequences, biology and treatment. Neuropsychobiology 43: 150-162.
33. "Secret aid" (2016) Secret aid worker: when your dream job ends in depression. Global development professionals network: Secret aid worker: The Guardian.
34. "Secret aid" (2015) Secret aid worker: sometimes I go to supermarkets to escape the loneliness. Global development professionals network: Secret aid worker: The Guardian.
35. Welton-Mitchell CE (2013) UNHCR's mental health and psychosocial support for staff. Geneva: UNHCR.
36. IASC (2007) IASC guidelines on mental health and psychosocial support in emergency settings. Geneva: IASC.

37. PHAP (2015) Live online consultation: Humanitarian effectiveness and staff wellness: Summary report of the online consultation event organized on 30 July 2015 by PHAP in support of the World Humanitarian Summit Geneva.
38. Muhumuza R (2017) Aid workers face unique crisis in South Sudan war, says ICRC. Chicago Tribune.
39. Strohmeier H (2018) Organizational staff support in South Sudan: An overview of current services and recommendations for future initiatives. n.p.: Queen Margaret University.
40. Stoddard A, Harmer A, Haver K (2011) Safety and security for national humanitarian workers. New York: UNOCHA.
41. Slim H (2015) Humanitarian ethics. A guide to the morality of aid in war and disaster. Oxford, New York: Oxford University Press.
42. Pantuliano S (2015) Life on the humanitarian frontlines: the challenge of staying the course.
43. Fast L (2014) Explanations in the shadows: Competing images of aid Aid in danger: The perils and promise of humanitarianism. Philadelphia: University of Pennsylvania Press. pp. 127-172.
44. UNHCR, University W (2016) Staff well-being and mental health in UNHCR. Geneva: UNHCR.
45. Schaufeli W (2017) Applying the Job Demands-Resources model: A 'how to' guide to measuring and tackling work engagement and burnout. Organizational Dynamics 46: 120-132.
46. Schaufeli W, Taris T (2014) A critical review of the Job Demands-Resource Model: Implications for improving work and health. In: Georg F. Bauer, Hämmig O, editors. Bridging occupational, organizational and public health: A transdisciplinary approach: Springer. pp. 43-68.
47. WHO (2015) List of National Ethics Committees. n.p.
48. Renner W, Salem I, Ottomeyer K (2006) Cross-cultural validation of measures of traumatic symptoms in groups of asylum seekers from Chechnya, Afghanistan, and West Africa. Social Behaviour and Personality: An International Journal 34: 1101-1114.
49. Meneses-Gaya Cd, Zuardi AW, Loureiro SR, Crippa JAS (2009) Alcohol Use Disorders Identification Test (AUDIT): an updated systematic review of psychometric properties. Psychology and Neuroscience 2.
50. Poghosyan L, Aiken LH, Sloane DM (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: 894-902.
51. Bovin MJ, Marx BP, Weathers FW, Gallagher MW, Rodriguez P, et al. (2015) Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in Veterans. Psychological Assessment 28: 1379-1391.
52. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, et al. (2013) The PTSD Checklist for DSM-5 (PCL-5). National Center for PTSD.
53. American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders. Arlington: American Psychiatric Association.
54. Ventevogel P, Vries GD, Scholte WF, Shinwari NR, Faiz H, et al. (2007) Properties of the Hopkins Symptom Checklist-25 (HSCL-25) and the Self-Reporting Questionnaire (SRQ-20) as screening

instruments used in primary care in Afghanistan. Social Psychiatry and Psychiatric Epidemiology 42: 328-335.

55. Babor T, Higgins-Biddle J, Saunders J, Monteiro M (2001) AUDIT: The alcohol use disorders identification test. Guidelines for use in primary care. Geneva.

56. Bush KR, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA (1998) Alcohol Use Disorders Identification Test - Consumption Items (AUDIT-C, AUDIT-3, AUDIT-QF).

57. Maslach C, Jackson SE (1986) Maslach Burnout Inventory Manual. . Palo Alto: Consulting Psychologists Press.

58. Hakanen J, Schaufeli W (2012) Do burnout and work engagement predict depressive symptoms and life satisfaction? A three-wave seven-year prospective study. Journal of Affective Disorder 141: 415-424.

59. Mollica RF (2004) Measuring trauma, measuring torture: Instructions and guidance on the utilization of the Harvard Program in Refugee Trauma's versions of The Hopkins Symptom Checklist-25 (HSCL-25) & the Harvard Trauma Questionnaire (HTQ). Cambridge, MA: Harvard Program in Refugee Trauma.

60. Bliese P, Halverson L (1996) Vertical and Horizontal Team Cohesion Scale. Journal of Applied Social Psychology 26.

61. Seidlitz L, Abernethy AD, Duberstein PR, Evinger JS, Chang TH, et al. (2002) Development of the spiritual transcendence index. Journal of the Scientific Study of Religion 41: 439-453.

62. Cooper C, Katona C, Orrell M, Livingston G (2006) Coping strategies and anxiety in caregivers of people with Alzheimer's disease: the LASER-AD study. Journal of Affective Disorder 90: 15-20.

63. Yusoff N, Low WY, Yip CH (2010) Reliability and validity of the Brief COPE Scale (English version) among women with breast cancer undergoing treatment of adjuvant chemotherapy: a Malaysian study. The Medical Journal of Malaysia 65: 41-44.

64. Kapsou M, Panayiotou G, Kokkinos CM, Demetriou AG (2010) Dimensionality of coping: an empirical contribution to the construct validation of the brief-COPE with a Greek-speaking sample. Journal of Health Psychology 15: 215-229.

65. Leng C, Lin Y, Wahba G (2006) A note on the LASSO and related procedures in variable selection. Statistica Sinica 16: 1273-1284.

66. James G, Witten D, Hastie T, Tibshirani R (2013) An introduction to statistical learning: With applications in R. New York, Heidelberg, Dordrecht, London: Springer.

67. Flom P, Cassell D (2007) Stopping stepwise: Why stepwise and similar selection methods are bad, and what you should use.

68. Zhang C-H, Huang J (2008) The sparsity and bias of the LASSO selection in high-dimensional linear regression. Annals of Statistics 36.

69. Grogan T, Elashoff D (2017) A simulation based method for assessing the statistical significance of logistic regression models after common variable selection procedures. Communications in Statistics - Simulation and computation 46: 7180-7193.

70. Symes L, Maddoux J, McFarlane J, Pennings J (2016) A Risk Assessment Tool to Predict Sustained PTSD Symptoms Among Women Reporting Abuse. Journal of Women's Health 25: 340-347.

71. M. A. Bertocci, G. Bebko, A. Versace, S. Iyengar, L. Bonar, et al. (2016) Reward-related neural activity and structure predict future substance use in dysregulated youth. Psychological Medicine 47: 1357-1369.

72. Zhao S, Shojaie A, Witten D (2017) In defense of the indefensible: A very naive approach to high-dimensional inference. arXiv:170505543 [statME].

73. Belloni A, Chernozhukov V (2013) Least squares after model selection in high-dimensional sparse models. Bernoulli 19: 521–547.

74. Woodward A, Sondorp E, Witter S, Martineau T (2016) Health systems research in fragile and conflict-affected states: A research agenda-setting exercise. Health Research Policy and Systems 14.

75. Fryrear A (2015) Survey response rates.

76. Burgard SA, Chen PV (2014) Challenges of health measurement in studies of health disparities. Social Science & Medicine 106: 143-150.

77. Adaku A, Okello J, Lowry B, Kane JC, Alderman S, et al. (2016) Mental health and psychosocial support for South Sudanese refugees in northern Uganda: a needs and resource assessment. Conflict and Health 10.

78. Amnesty International (2016) Our hearts have gone dark: The mental health impact of South Sudan's conflict. London.

79. Dean G. Kilpatrick, Heidi S. Resnick, Melissa E. Milanak, Mark W. Miller, Katherine M. Keyes, et al. (2013) National Estimates of Exposure to Traumatic Events and PTSD Prevalence Using DSM-IV and DSM-5 Criteria. Journal of Traumatic Stress 26: 537-547.

80. Burri A, Maercker A (2014) Differences in prevalence rates of PTSD in various European countries explained by war exposure, other trauma and cultural value orientation. BMC Research Notes 7.

81. Remes O, Brayne C, Linde Rvd, Lafortune L (2016) A systematic review of reviews on the prevalence of anxiety disorders in adult populations. Brain and Behavior 6.

82. Coral L. Ruffin (1993) Stress and health—little hassles vs. major life events. Australian Psychologist 28.

83. Holtz TH, Salama P, Cardozo BL, Gotway CA (2002) Mental Health Status of Human Rights Workers, Kosovo, June 2002. Journal of Traumatic Stress 15: 389-395.

84. Rafael del-Pino-Casado, Margarita Perez-Cruz, Frıas-Osuna A (2014) Coping, subjective burden and anxiety among family caregivers of older dependents. Journal of clinical nursing 23: 3335–3344.

85. Cooper C, Katona C, Orrell M, Livingston G (2008) Coping strategies, anxiety and depression in caregivers of people with Alzheimer's disease. International Journal of Geriatric Psychiatry 23: 929–936.

86. Coolidge FL, Segal DL, Hook JN, Stewart S (2000) Personality disorders and coping among anxious older adults. Journal of Anxiety Disorders 14: 157–172.

87. Cherewick M, Doocy S, Tol W, Burnham G, Glass N (2016) Potentially traumatic events, coping strategies and associations with mental health and well-being measures among conflict-affected youth in Eastern Democratic Republic of Congo. Global Health Research and Policy 1.

88. Seidlitz L, Abernethy A, Duberstein P, Evinger S, Lewis B, et al. (2002) Development of the Spiritual Transcendence Index. Journal for the Scientific Study of Religion 41.

89. Stephen J. Ganocy, Toyomi Goto, Philip K. Chan, Gregory H. Cohen, Laura Sampson, et al. (2016) Association of spirituality with mental health conditions in Ohio National Guard Soldiers. Journal of Nervous and Mental Disease 204: 524-529.

90. de Beer J, Scherrer R, Rothmann I (2017) Stress, burnout and derailment and resilience in leadership: . In: Johnson AJ, Veldsman TV, editors. Leadership dynamis and well-being: Perspectives from the front line. Randburg: KR Publishing

91. Kavanagh A, Krnjacki L (2011) Accessibility to alcohol outlets and alcohol consumption: Findings from VicLANES. Carlton.

92. Lopes Cardozo B, Gotway Crawford C, Eriksson C, Zhu J, Sabin M, et al. (2012) Psychological Distress, Depression, Anxiety, and Burnout among International Humanitarian Aid Workers: A Longitudinal Study. . Plos One 7.

93. "Secret aid" (2015) Secret aid worker: sexual harassment and discrimination in the industry. Secret aid worker: The Guardian.

94. Wall I (2015) Sexual assaults against aid workers: how serious is the situation? : The Guardian.

95. South Sudan NGO Forum (2017) Country Directors' weekly update: 12 November 2017. Juba: NGO Forum.

96. Sinclair M, O'Toole J, Malawaraarachchi M, Leder K (2012) Comparison of response rates and cost-effectiveness for a community-based survey: postal, internet and telephone modes with generic or personalised recruitment approaches. BMC Medical Research Methodology 12.

1. UN Meetings Coverage and Press Releases (2017) Security Council presidential statement urges greater humanitarian access to famine threatened Yemen, South Sudan, Somalia, Nigeria.

2. UN News Center (2017) UN aid chief urges global action as starvation, famine loom for 20 million across four countries. UN News Center.

3. UNOCHA South Sudan (2016) 2017 Humanitarian needs overview. n.p.: UNOCHA.

4. Humanitarian Outcomes (2016) Aid worker security report: Figures at a glance. n.p.

5. Stoddard A, Harmer A, Czwarno M (2017) Aid worker security report 2017: Behind the attacks. A look at the perpetrators of violence against aid workers. n.p.: Humanitarian outcomes.

6. Humanitarian Outcomes (2016) Aid worker security report 2015: Figures at a glance. London.

7. Humanitarian Outcomes (2017) Aid worker security report 2016: Figures at a glance. London.

8. Deutsche Welle (2016) Embassies evacuate as violence worsens in South Sudan. Deutsche Welle.

9. Dumo D (2017) South Sudan soldiers accused of rape, murder of aid workers appear in court. World News: Reuters.

10. UNOCHA (2018) South Sudan: Aid workers freed, humanitarian deaths reach 100 since December 2013. Reliefweb.

11. Brady K, Killeen T, Brewerton T, Lucerini S (2000) Comorbidity of psychiatric disorders and posttraumatic stress disorder. Journal of Clinical Psychiatry 61: 22-32.

12. Miller KE, Rasmussen A (2010) War exposure, daily stressors, and mental health in conflict and post-conflict settings: Bridging the divide between trauma-focused and psychosocial frameworks. Social Science & Medicine 70: 7-16.

13. Collins PY, Patel V, Joestl SS, March D, Insel TR, et al. (2011) Grand challenges in global mental health. Nature 475: 27-30.

14. Maslach C, Jackson SE, Leitner M (1997) Maslach Burnout Inventory Manual. Palo Alto: Consulting Psychologists Press.

15. McKay L (2011) Resilience: Building resilient managers in humanitarian organizations. Strenghtening key organizational structures and personal skills that promote resilience in challenging environments. n.p.: People in Aid.
16. Strohmeier H, Scholte WF (2015) Trauma-related mental health problems among national humanitarian staff: A systematic review of the literature. European Journal of Psychotraumatology 6.
17. Ager A, Pasha E, Yu G, Duke T, Eriksson C, et al. (2012) Stress, mental health, and burnout in national humanitarian aid workers in Gulu, Northern Uganda. Journal of Traumatic Stress 25: 713-720.
18. Eriksson CB, Lopes Cardozo B, Ghitis F, Sabin ME, Gotway Crawford CA, et al. (2013) Factors associated with adverse mental health outcomes in locally recruited aid workers assisting Iraqi refugees in Jordan. Journal of Aggression, Maltreatment and Trauma 22: 660-680.
19. Eriksson CB, Lopes Cardozo B, Foy DW, Sabin M, Ager A, et al. (2012) Predeployment mental health and trauma exposure of expatriate humanitarian aid workers: Risk and resilience factors. Traumatology 19: 41-48.
20. Lopes Cardozo B, Holtz TH, Kaiser R, Gotway CA, Ghitis F, et al. (2005) The mental health of expatriate and Kosovar Albanian humanitarian aid workers. Disasters 29: 152-170.
21. Connorton E, Perry MJ, Hemenway D, Miller M (2012) Humanitarian relief work and trauma-related mental illness. Epidemiological Reviews 34: 145-155.
22. Lopes Cardozo B, Sivilli TI, Crawford CA, Scholte WF, Petit P, et al. (2013) Factors affecting mental health of local staff working in the Vanni region, Sri Lanka. Psychological Trauma: Theory, Research, Practice, and Policy 5: 581-590.
23. Jachens L, Houdmont J, Thomas R (2016) Effort-Reward Imbalance and Heavy Alcohol Consumption Among Humanitarian Aid Workers. Journal of Studies on Alcohol and Drugs 77: 904-913.
24. Eriksson CB, Kemp HV, Richard Gorsuch, Hoke S, Foy DW (2001) Trauma Exposure and PTSD Symptoms in International Relief and Development Personnel. Journal of Traumatic Stress 14: 205-212.
25. Musa SA, Hamid AARM (2008) Psychological problems among aid workers operating in Darfur. Social Behaviour and Personality: An International Journal 36: 407-416.
26. Lopes-Cardozo B, Gotway-Crawford C, Eriksson C, Zhu J, Sabin M, et al. (2012) Psychological distress, depression, anxiety, and burnout among international humanitarian aid workers: A longitudinal study Plos One 7.
27. Eriksson CB, Bjorck JP, Larson LC, Walling SM, Trice GA, 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: 671-686.
28. Surya M, Jaff D, Stilwell B, Schubert J (2017) The importance of mental well-being for health professionals during complex emergencies: It is time we take it seriously. Global Health: Science and Practice 5: 188-196.
29. Antares Foundation (2012) Managing stress in humanitarian workers: Guidelines for good practice. Amsterdam.
30. Schafer A (2010) Spirituality and mental health in humanitarian contexts: an exploration based on World Vision's Haiti earthquake response. Intervention 8: 121-130.
31. Eriksson C, Holland J, Currier J, Snider L, Ager A, et al. (2014) Trajectories of spiritual change among expatriate humanitarian aid workers: A prospective longitudinal study. Psychology of Religion and Spirituality 7: 13-23.

36

32. Brunello N, Davidson JRT, Deahl M, Kessler RC, Mendlewicz J, et al. (2001) Posttraumatic stress disorder: Diagnosis and epidemiology, comorbidity and social consequences, biology and treatment. Neuropsychobiology 43: 150-162.

33. "Secret aid" (2016) Secret aid worker: when your dream job ends in depression. Global development professionals network: Secret aid worker: The Guardian.

34. "Secret aid" (2015) Secret aid worker: sometimes I go to supermarkets to escape the loneliness. Global development professionals network: Secret aid worker: The Guardian.

35. Welton-Mitchell CE (2013) UNHCR's mental health and psychosocial support for staff. Geneva: UNHCR.

36. IASC (2007) IASC guidelines on mental health and psychosocial support in emergency settings. Geneva: IASC.

37. PHAP (2015) Live online consultation: Humanitarian effectiveness and staff wellness: Summary report of the online consultation event organized on 30 July 2015 by PHAP in support of the World Humanitarian Summit Geneva.

38. Muhumuza R (2017) Aid workers face unique crisis in South Sudan war, says ICRC. Chicago Tribune.

39. Strohmeier H (2018) Organizational staff support in South Sudan: An overview of current services and recommendations for future initiatives. n.p.: Queen Margaret University.

40. Stoddard A, Harmer A, Haver K (2011) Safety and security for national humanitarian workers. New York: UNOCHA.

41. Slim H (2015) Humanitarian ethics. A guide to the morality of aid in war and disaster. Oxford, New York: Oxford University Press.

42. Pantuliano S (2015) Life on the humanitarian frontlines: the challenge of staying the course.

43. Fast L (2014) Explanations in the shadows: Competing images of aid Aid in danger: The perils and promise of humanitarianism. Philadelphia: University of Pennsylvania Press. pp. 127-172.

44. UNHCR, University W (2016) Staff well being and mental health in UNHCR. Geneva: UNHCR.

45. Schaufeli W (2017) Applying the Job Demands-Resources model: A 'how to' guide to measuring and tackling work engagement and burnout. Organizational Dynamics 46: 120-132.

46. Schaufeli W, Taris T (2014) A critical review of the Job Demands-Resource Model: Implications for improving work and health. In: Georg F. Bauer, Hämmig O, editors. Bridging occupational, organizational and public health: A transdisciplinary approach: Springer. pp. 43-68.

47. WHO (2015) List of National Ethics Committees. n.p.

48. Renner W, Salem I, Ottomeyer K (2006) Cross-cultural validation of measures of traumatic symptoms in groups of asylum seekers from Chechnya, Afghanistan, and West Africa. Social Behaviour and Personality: An International Journal 34: 1101-1114.

49. Meneses-Gaya Cd, Zuardi AW, Loureiro SR, Crippa JAS (2009) Alcohol Use Disorders Identification Test (AUDIT): an updated systematic review of psychometric properties. Psychology and Neuroscience 2.

50. Poghosyan L, Aiken LH, Sloane DM (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: 894-902.
51. Bovin MJ, Marx BP, Weathers FW, Gallagher MW, Rodriguez P, et al. (2015) Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in Veterans. Psychological Assessment 28: 1379-1391.
52. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, et al. (2013) The PTSD Checklist for DSM-5 (PCL-5). National Center for PTSD.
53. American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders. Arlington: American Psychiatric Association.
54. Ventevogel P, Vries GD, Scholte WF, Shinwari NR, Faiz H, et al. (2007) Properties of the Hopkins Symptom Checklist-25 (HSCL-25) and
the Self-Reporting Questionnaire (SRQ-20) as screening
instruments used in primary care in Afghanistan. Social Psychiatry and Psychiatric Epidemiology 42: 328-335.
55. Babor T, Higgins-Biddle J, Saunders J, Monteiro M (2001) AUDIT: The alcohol use disorders identification test. Guidelines for use in primary care. Geneva.
56. Bush KR, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA (1998) Alcohol Use Disorders Identification Test - Consumption Items (AUDIT-C, AUDIT-3, AUDIT-QF).
57. Maslach C, Jackson SE (1986) Maslach Burnout Inventory Manual. . Palo Alto: Consulting Psychologists Press.
58. Hakanen J, Schaufeli W (2012) Do burnout and work engagement predict depressive symptoms and life satisfaction? A three-wave seven-year prospective study. Journal of Affective Disorder 141: 415-424.
59. Mollica RF (2004) Measuring trauma, measuring torture: Instructions and guidance on the utilization of the Harvard Program in Refugee Trauma's versions of The Hopkins Symptom Checklist-25 (HSCL-25) & the Harvard Trauma Questionnaire (HTQ). Cambridge, MA: Harvard Program in Refugee Trauma.
60. Bliese P, Halverson L (1996) Vertical and Horizontal Team Cohesion Scale. Journal of Applied Social Psychology 26.
61. Seidlitz L, Abernethy AD, Duberstein PR, Evinger JS, Chang TH, et al. (2002) Development of the spiritual transcendence index. Journal of the Scientific Study of Religion 41: 439-453.
62. Cooper C, Katona C, Orrell M, Livingston G (2006) Coping strategies and anxiety in caregivers of people with Alzheimer's disease: the LASER-AD study. Journal of Affective Disorder 90: 15-20.
63. Yusoff N, Low WY, Yip CH (2010) Reliability and validity of the Brief COPE Scale (English version) among women with breast cancer undergoing treatment of adjuvant chemotherapy: a Malaysian study. The Medical Journal of Malaysia 65: 41-44.
64. Kapsou M, Panayiotou G, Kokkinos CM, Demetriou AG (2010) Dimensionality of coping: an empirical contribution to the construct validation of the brief-COPE with a Greek-speaking sample. Journal of Health Psychology 15: 215-229.
65. Leng C, Lin Y, Wahba G (2006) A note on the LASSO and related procedures in variable selection. Statistica Sinica 16: 1273-1284.
66. James G, Witten D, Hastie T, Tibshirani R (2013) An introduction to statistical learning: With applications in R. New York, Heidelberg, Dordrecht, London: Springer.

67. Flom P, Cassell D (2007) Stopping stepwise: Why stepwise and similar selection methods are bad, and what you should use.

68. Zhang C-H, Huang J (2008) The sparsity and bias of the LASSO selection in high-dimensional linear regression. Annals of Statistics 36.

69. Grogan T, Elashoff D (2017) A simulation based method for assessing the statistical significance of logistic regression models after common variable selection procedures. Communications in Statistics - Simulation and computation 46: 7180-7193.

70. Symes L, Maddoux J, McFarlane J, Pennings J (2016) A Risk Assessment Tool to Predict Sustained PTSD Symptoms Among Women Reporting Abuse. Journal of Women's Health 25: 340-347.

71. M. A. Bertocci, G. Bebko, A. Versace, S. Iyengar, L. Bonar, et al. (2016) Reward-related neural activity and structure predict future substance use in dysregulated youth. Psychological Medicine 47: 1357-1369.

72. Zhao S, Shojaie A, Witten D (2017) In defense of the indefensible: A very naive approach to high-dimensional inference. arXiv:170505543 [statME].

73. Belloni A, Chernozhukov V (2013) Least squares after model selection in high-dimensional sparse models. Bernoulli 19: 521–547.

74. Woodward A, Sondorp E, Witter S, Martineau T (2016) Health systems research in fragile and conflict-affected states: A research agenda-setting exercise. Health Research Policy and Systems 14.

75. Fryrear A (2015) Survey response rates.

76. Burgard SA, Chen PV (2014) Challenges of health measurement in studies of health disparities. Social Science & Medicine 106: 143-150.

77. Adaku A, Okello J, Lowry B, Kane JC, Alderman S, et al. (2016) Mental health and psychosocial support for South Sudanese refugees in northern Uganda: a needs and resource assessment. Conflict and Health 10.

78. Amnesty International (2016) Our hearts have gone dark: The mental health impact of South Sudan's conflict. London.

79. Dean G. Kilpatrick, Heidi S. Resnick, Melissa E. Milanak, Mark W. Miller, Katherine M. Keyes, et al. (2013) National Estimates of Exposure to Traumatic Events and PTSD Prevalence Using DSM-IV and DSM-5 Criteria. Journal of Traumatic Stress 26: 537-547.

80. Burri A, Maercker A (2014) Differences in prevalence rates of PTSD in various European countries explained by war exposure, other trauma and cultural value orientation. BMC Research Notes 7.

81. Remes O, Brayne C, Linde Rvd, Lafortune L (2016) A systematic review of reviews on the prevalence of anxiety disorders in adult populations. Brain and Behavior 6.

82. Coral L. Ruffin (1993) Stress and health—little hassles vs. major life events. Australian Psychologist 28.

83. Holtz TH, Salama P, Cardozo BL, Gotway CA (2002) Mental Health Status of Human Rights Workers, Kosovo, June 2002. Journal of Traumatic Stress 15: 389-395.

84. Rafael del-Pino-Casado, Margarita Perez-Cruz, Frias-Osuna A (2014) Coping, subjective burden and anxiety among family caregivers of older dependents. Journal of clinical nursing 23: 3335-3344.

85. Cooper C, Katona C, Orrell M, Livingston G (2008) Coping strategies, anxiety and depression in caregivers of people with Alzheimer's disease. International Journal of Geriatric Psychiatry 23: 929-936.

86. Coolidge FL, Segal DL, Hook JN, Stewart S (2000) Personality disorders and coping among anxious older adults. Journal of Anxiety Disorders 14: 157–172.
87. Cherewick M, Doocy S, Tol W, Burnham G, Glass N (2016) Potentially traumatic events, coping strategies and associations with mental health and well-being measures among conflict-affected youth in Eastern Democratic Republic of Congo. Global Health Research and Policy 1.
88. Seidlitz L, Abernethy A, Duberstein P, Evinger S, Lewis B, et al. (2002) Development of the Spiritual Transcendence Index. Journal for the Scientific Study of Religion 41.
89. Stephen J. Ganocy, Toyomi Goto, Philip K. Chan, Gregory H. Cohen, Laura Sampson, et al. (2016) Association of spirituality with mental health conditions in Ohio National Guard Soldiers. Journal of Nervous and Mental Disease 204: 524–529.
90. de Beer J, Scherrer R, Rothmann I (2017) Stress, burnout and derailment and resilience in leadership: . In: Johnson AJ, Veldsman TV, editors. Leadership dynamis and well-being: Perspectives from the front line. Randburg: KR Publishing
91. Kavanagh A, Krnjacki L (2011) Accessibility to alcohol outlets and alcohol consumption: Findings from VicLANES. Carlton.
92. Lopes Cardozo B, Gotway Crawford C, Eriksson C, Zhu J, Sabin M, et al. (2012) Psychological Distress, Depression, Anxiety, and Burnout among International Humanitarian Aid Workers: A Longitudinal Study. . Plos One 7.
93. "Secret aid" (2015) Secret aid worker: sexual harassment and discrimination in the industry. Secret aid worker: The Guardian.
94. Wall I (2015) Sexual assaults against aid workers: how serious is the situation? : The Guardian.
95. South Sudan NGO Forum (2017) Country Directors' weekly update: 12 November 2017. Juba: NGO Forum.
96. Sinclair M, O'Toole J, Malawaraarachchi M, Leder K (2012) Comparison of response rates and cost-effectiveness for a community-based survey: postal, internet and telephone modes with generic or personalised recruitment approaches. BMC Medical Research Methodology 12.