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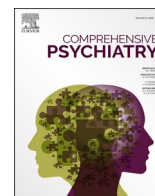
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Correlates of risk-taking behaviour and suicidality among humanitarian aid workers

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ABSTRACT

In an era of high need for humanitarian assistance, humanitarian aid workers face increased exposure to potentially traumatic events and, correspondingly, a greater risk of psychological distress (e.g., anxiety, depression, posttraumatic stress disorder [PTSD], and burnout). Less studied among humanitarian workers, however, are other known correlates of trauma-exposure: complex PTSD, risk-taking behaviours, and suicidality. The current study examined levels of trauma exposure and rates of trauma-related mental health disorders, risk-taking behaviour, and levels of suicidality among a sample ($N = 232$) of humanitarian workers located across 52 countries. Multiple linear regression analysis was used to determine which demographic (i.e., sex, age, cadre, years working as an aid worker), psychological (i.e., social support, personality traits), and trauma-related (trauma exposure, complex posttraumatic stress disorder [CPTSD] symptoms, and dissociation) variables were uniquely associated with risk-taking behaviours and suicidality. Overall, 12.9 % (95 % CI = 8.5 %, 17.2 %) of humanitarian workers met the diagnostic requirements for PTSD, and 8.6 % (95 % CI = 5.0 %, 12.2 %) met requirements for CPTSD. Higher risk-taking behaviours were significantly associated with being male, an international worker, greater trauma exposure, extraversion, neuroticism, and CPTSD symptoms. Suicidality was significantly associated with being an international staff member and higher levels of dissociation. Results are consistent with previous studies citing a high risk of psychological distress among humanitarian workers. Humanitarian aid agencies have a duty of care to their workers - both professional and volunteer - and greater safeguarding measures are necessary to mitigate the risk to mental health brought on by humanitarian work-related stressors.

1. Introduction

Brought on by natural disasters, unresolved and emerging armed conflict, and climate change-related weather events, an unprecedented 404.3 million people in 83 countries are currently estimated to require

humanitarian assistance, a figure which has more than doubled in the last five years [1]. Humanitarian aid workers and volunteers, many of whom are members of the affected populations they serve, play a crucial role in responding to this need for assistance.

In addition to working in challenging environments, humanitarian

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aid workers face additional burdens of demanding working conditions, long working hours, separation from family members, interpersonal conflicts, and safety and security concerns (e.g., mistrust and sometimes violence from recipient communities, car-jackings, armed attacks, kidnappings, suicide bombings, verbal and psychological threats, robbery, and sexual violence) [2–4]. Previous research conducted in Northern Uganda, for example, found that half of all humanitarian aid workers surveyed had experienced five or more potentially traumatic events (PTEs) [5]. Moreover, recent trends indicate that acts of violence against humanitarian aid workers are increasing, particularly in conflict-affected regions [6,7].

Previous research [8] tracking a cohort of international Médecins Sans Frontières (MSF) workers across various psychological outcomes – before assignment, after assignment, and at two-month follow-up – found that despite a deterioration in vitality, emotional wellbeing, and social functioning post-assignment, humanitarian workers exhibited lower rates of anxiety and major depressive disorder compared to the general population. Conversely, and similar to other groups whose occupation presents an elevated risk of trauma exposure (e.g., military, police, emergency first responders) [9], considerable research, including a recent systematic review and meta-analysis [10], points to humanitarian aid workers being at increased risk of trauma-related mental health problems including anxiety, depression, posttraumatic stress disorder (PTSD), moral injury, and burnout compared to the general population [11–14].

Less studied among humanitarian aid workers, however, are other forms of trauma-related responses and behaviours, including risk-taking behaviours, Complex PTSD (CPTSD), and suicidality [13]. Broadly defined as any behaviour where there is uncertainty around the outcome, risk-taking behaviours resulting in a negative outcome can harm both the individual and cause reputational damage to an organisation [15,16]. One study of over 1100 International Committee of the Red Cross (ICRC) humanitarian workers, for example, found that 27% of expatriate staff had engaged in risk-taking behaviour related to their most recent mission, including engaging in sexual relations with someone other than their regular partner, recreational drug use, and increased alcohol consumption [17].

New to the 11th revision of the International Classification of Diseases (ICD-11) [18], CPTSD is characterised by the presence of the three symptom clusters of PTSD (i.e., avoidance, pervasive sense of threat, reexperiencing) *in addition to* three symptom clusters related to disturbances in self-organisation (DSO; disturbances in relationships, affect dysregulation, and negative self-concept), whereby DSO symptoms are thought to emerge as a result of repeated or chronic trauma exposure causing deterioration of emotional and relational capacities and sense of self [19]. While extant research on the risk of CPTSD and suicidality among humanitarian workers is limited, an elevated risk of both CPTSD and suicidality have been identified among other forms of first responders (i.e., police officers, emergency medical technicians (EMTs), firefighters, and paramedics) who, like humanitarian workers, also face job-related stressors that confer an increased risk of psychological injury [20,21]. It is therefore likely that expressions of suicidality and CPTSD are present among humanitarian aid workers.

Protecting and promoting the mental health of humanitarian aid workers is central to staff and volunteer wellbeing, maintaining effective delivery of services for programme beneficiaries, as well as to mitigate potential reputational damage for organisations where staff engage in potentially inappropriate risky behaviours. Research suggests, however, that different cadres of humanitarian workers (i.e., national, local volunteer, expatriate/international staff) [2], face differing levels of risk for adverse mental health outcomes [22,23]. Given the differential treatment across types of humanitarian aid workers, there is a moral obligation to ensure that policies or interventions developed by organisations to protect their workers from the adverse impact of trauma exposure are applied to *all* staff and volunteers, including workers recruited internationally, nationally, and from local communities, the

latter two representing the vast majority of responders [13].

Recognising the ongoing need for high numbers of humanitarian aid workers around the world, as well as the limited data available on the factors associated with risk-taking and suicidal behaviours among staff and volunteers alike, we set out to assess levels of work-related PTE exposure, rates of trauma-related mental health disorders (PTSD and CPTSD), risk-taking behaviour, and levels of suicidality in a global sample of humanitarian aid workers. In addition, we sought to identify demographic, psychosocial, and mental health variables associated with risk-taking behaviours and suicidality in humanitarian aid workers.

2. Materials and methods

2.1. Participants and procedures

Participants were humanitarian aid workers ($N = 232$) who completed an anonymous online survey. An invitation to take part in the anonymous online survey was circulated via email and personal messaging (e.g., WhatsApp) to employees and volunteers across a wide range of humanitarian agencies, including to National Societies of the International Federation of the Red Cross, Red Crescent Movement, via the International Federation of the Red Cross' Psychosocial Reference Centre; the International Committee of the Red Cross; MSF; as well as through humanitarian worker groups on social media. Contained in the invitation was a link to a detailed description of the study, which outlined the study's objectives, procedures, and potential risks, in addition to the survey link. Prior to commencing the survey, participants were asked to give electronic consent. Participants were unable to progress to the survey until consent had been given. Data were collected between September 2019 and November 2020. Respondents were located across 52 countries with the most common locations being Iran ($n = 117$), Nigeria ($n = 14$), and Bangladesh ($n = 12$). Inclusion criteria were that participants were aged 18 years or older at the time of the survey, had been deployed on mission within the last six months, and could read and complete the survey in English or Persian.

Ethical approval was obtained from the National College of Ireland Ethics Committee, Dublin, Ireland, and the University of Social Welfare and Rehabilitation Sciences Ethics Committee, Tehran, Iran (IR. USWR. REC.1399.127). Sociodemographic characteristics of the sample are presented in Table 1.

Table 1
Sociodemographic characteristics of the sample ($N = 233$).

	%	Mean	SD
Sex			
Female	42.5		
Male	57.5		
Age		35.19	9.18
Cadre			
Local Volunteer	37.2		
National/Resident staff	19.0		
Expatriate/International staff	40.7		
Other	2.6		
Years working in Humanitarian Sector		10.77	6.49
Role			
Logistics	1.3		
Finance and Administration	3.1		
Programming	14.3		
Management	19.3		
Medical	7.6		
Emergency Services	28.7		
Other	5.8		
Multiple Roles	19.7		

Note: SD = Standard deviation.

2.2. Measures

2.2.1. Demographic variables

Participants were asked about their sex, age, number of years working as a humanitarian aid worker, and cadre (i.e., national, local volunteer, expatriate/international staff). For analytical purposes, national and volunteer staff were combined into a single category with expatriate/international staff in a second category. While all questionnaires were originally developed in English, translation procedures into Persian involved a two-step approach. First, the questionnaires were translated into Persian by bilingual experts familiar with both the source language and the cultural nuances of the target population. Then, a back-translation process was performed to ensure the accuracy and equivalence of meaning between the original and translated versions.

2.2.2. Psychosocial factors

Given reported associations between personality traits and both suicidal ideation [24] and risk-taking behaviours [25,26], personality traits were assessed using the 10-item ultra-short form of the Big-Five Inventory (BFI-10) [27]. Adapted from the BFI-44 [28], the BFI-10 measures the ‘Big Five’ personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism by two items each and has been shown to retain good psychometric properties across populations [29,30]. Ten items are scored on a five-point Likert scale ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (5), such that higher scores reflect higher levels of each trait. Internal reliability estimates are not reported given that coefficient alpha is inappropriate for assessing internal consistency where only two items are used [31].

Given the importance of social support as a protective factor for suicide and risk-related behaviours [32,33] and the role of social support in predicting psychological outcomes among first responders and disaster and recovery workers [34], social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS) [35]. The MSPSS includes 12 items where respondents indicate their agreement with each statement in relation to sources of social support in their lives from family, friends, and a significant other. Responses were provided using a seven-point Likert scale ranging from 1 (Very strongly disagree) to 7 (Very strongly agree). The MSPSS scale has been shown to produce reliable and valid scores [36,37]. Given the importance of organisational and peer support as a determinant of mental health outcomes among humanitarian volunteers, two additional items were added (i.e., ‘The organisation I work for offers me support for my personal problems’ and ‘I can talk to my colleagues about personal issues’). A total

scale score of the 14 items was computed with higher scores reflecting greater social support. The internal reliability of the MSPSS in this sample, including the two additional work-related items, was excellent ($\alpha = 0.92$).

Potential work-related trauma exposure was measured using a 16-item checklist specifically developed by the research team to capture potentially threatening life events related to humanitarian work. Respondents were asked if they had ‘experienced each event during their time as an aid worker’ (e.g., armed attack or robbery, being taken hostage, witnessing the murder of a co-worker, friend or family member, rape or sexual violence, handling of dead bodies). The complete list of PTEs is presented in Table 2. Responses were provided on a ‘Yes’ or ‘No’ basis. A total score from 0 to 16 was computed with higher scores reflecting exposure to a greater number of different types of PTEs as a humanitarian aid worker.

PTSD and CPTSD were measured using the International Trauma Questionnaire [7] (ITQ), a self-report measure designed to capture all aspects of a PTSD and CPTSD diagnosis as per the guidelines set forth in the ICD-11 [18]. The ITQ contains 12 items assessing symptoms across six clusters (re-experiencing, avoidance, and sense of threat, as measures of PTSD, and affective dysregulation, negative self-concept, and disturbed relationships, as measures of DSO). All items are answered in relation to the PTE participants reported finding ‘most distressing’ (i.e., the index trauma). Participants indicated how bothered they were by each symptom over the past month using a five-point Likert scale ranging from 0 (Not at all) to 4 (Extremely). The ITQ can be scored categorically and continuously [38]. A continuous CPTSD symptom score is computed by summing all 12 items, and scores can range from 0 to 48, with higher scores reflecting higher levels of CPTSD symptoms. Scored categorically, probable diagnosis of PTSD and CPTSD are computed in accordance with diagnostic guidelines [38], whereby the diagnostic requirements for PTSD are met if a person endorses at least one symptom (n.b., by convention, a symptom is considered to be present if scored 2 [Moderately] or higher on the Likert scale) from each PTSD cluster and there is functional impairment associated with these symptoms. The diagnostic requirements for CPTSD are met if the PTSD criteria are satisfied and a person endorses at least one symptom from each DSO cluster, and the DSO symptoms are associated with functional impairment. The ITQ has been widely validated across cultures in both community and clinical samples [39,40]. The internal reliability of the ITQ scales scores in this sample was good ($\alpha = 0.88$).

Dissociation was measured using the 8-item Dissociative Symptoms Scale (DSS-8) [41,42]. The DSS-8 measures four forms of dissociation

Table 2
Work-related trauma exposure among humanitarian workers, disaggregated by sex.

Potentially Traumatic Event	Total		Males		Females		χ^2	p
	n	%	n	%	n	%		
A situation that was very frightening	168	72.1	82	61.2	86	86.9	17.4	<0.001
The handling of dead bodies	116	49.8	89	66.4	27	27.3	33.35	<0.001
Emergency evacuation	100	42.9	46	34.3	54	54.5	8.69	0.003
Verbal or physical threats against your life	97	41.6	50	37.3	47	47.5	2.02	0.155
A situation where your life was in danger	92	39.5	31	23.1	61	61.6	33.70	<0.001
Hostility from a local population	91	39.1	36	26.9	55	55.6	18.50	<0.001
Feeling close to death	87	37.3	47	35.1	40	40.4	0.482	0.487
An armed attack or robbery	47	20.2	17	12.7	30	30.3	9.90	<0.001
The murder of a co-worker	36	15.5	19	14.2	17	17.2	0.195	0.659
The murder of a friend or family member	28	12.0	19	14.2	9	9.1	0.954	0.329*
Rape or sexual violence	23	9.9	7	5.2	16	16.2	6.48	0.007*
Participation in fighting or a family member's involvement in fighting	15	6.4	12	9.0	3	3.0	2.4	0.103*
Being taken as a hostage	13	5.6	5	3.7	8	8.1	1.30	0.163*
Imprisonment	11	4.7	5	3.7	6	6.1	0.267	0.535
A landmine explosion	7	3.0	5	3.7	2	2.0	0.136	0.702*
Torture	6	2.6	3	2.2	3	3.0	0.000	0.701*

χ^2 = chi-square test of independence (with Yates' Continuity Correction); p = level of statistical significance, all chi-square tests have one degree of freedom. *Where cell frequency was less than 10, Fisher's Exact Probability Test is reported.

including derealization/depersonalisation, cognitive-behavioural re-experiencing, gaps in memory and awareness, and sensory misperceptions. Participants indicate how frequently they have experienced each dissociative experience over the past week on a five-point Likert scale ranging from 0 (*Not at all*) to 4 (*More than once a day*). Total scores range from 0 to 32, with higher scores reflecting higher levels of dissociation. The internal reliability of the scale scores in this sample was good ($\alpha = 0.87$).

2.2.3. Risk-taking behaviour and suicidality

The Risky, Impulsive and Self-Destructive Behaviour Questionnaire [43] (RISQ) was used to measure risk-taking behaviours. Participants indicated on a ‘Yes’ (1) or ‘No’ (0) basis which of 38 risk-taking behaviours they had engaged in ‘since starting their career as a humanitarian aid worker’. Items captured behaviours such as excessive alcohol and illicit drug use, gambling, perpetrating physical violence, engaging in high-risk sexual activity (e.g., buying or selling sex, unprotected sex with someone they did not know), reckless driving, and was adapted to further include sector-specific behaviour such as ignoring or breaking curfews and travel restrictions set by one’s organisation, or engaging in sexual relations with a beneficiary or aid recipient. A total scale score of the 38 items was computed, with higher scores reflecting higher risk-taking behaviours. The complete list of risk-taking behaviours is presented in Table 3.

Four items from the RISQ [22] assessed whether participants had ever (i) made a plan to kill themselves, (ii) thought about killing themselves, (iii) attempted suicide, or (iv) engaged in self harm since

starting their career as a humanitarian aid worker. These items were selected to represent suicidality. A total score ranging from 0 to 4 was computed, with higher scores reflecting greater suicidality since starting work as a humanitarian aid worker.

2.3. Data analysis

Descriptive statistics were computed to determine the mean number of PTEs experienced as a humanitarian aid worker, what proportion of humanitarian aid workers had experienced a work-related PTE, as well as what proportion had experienced multiple work-related PTEs. Additionally, the proportion of people meeting diagnostic requirements for PTSD and CPTSD were reported, along with mean levels of risk-taking behaviours and suicidality. Next, multiple linear regression analysis was used to determine which demographic, psychosocial, and mental health variables were uniquely associated with (a) risk-taking behaviours and (b) suicidality. Two multiple linear regressions were therefore estimated (i.e., for the dependent variables of risk-taking behaviours and suicidality) with 13 predictor variables (sex (0 = males, 1 = females), age, number of years working as an aid worker, cadre (0 = national/volunteer staff, 1 = expatriate/international staff), openness, conscientiousness, extraversion, agreeableness, neuroticism, social support, number of PTEs, CPTSD symptoms, and dissociation. Variables with missing data ranged from 1.2 % to 8.1 %, and missing data were managed using expectation–maximisation estimation.

Table 3
Risk-taking behaviours among humanitarian workers, disaggregated by sex.

Risky-behaviour	Total		Males		Females		χ^2	p
	n	%	n	%	n	%		
Impulsively bought stuff you did not need and won't use	54	23.2	20	14.9	34	34.3	19.99	<0.001
Drank 5 or more alcoholic drinks in 3 h or less	51	21.9	23	17.0	28	28.3	3.49	0.062
Drove 48kph or faster over the speed limit	48	20.6	37	27.6	11	11.1	8.50	0.004
Had unprotected sex with someone you just met or did not know well	37	15.9	14	10.4	23	23.2	6.04	0.014
Drank alcohol until you blacked/passed out	37	15.9	16	11.9	21	21.2	3.00	0.083
Ate a lot of food when not hungry	35	15.0	14	10.4	21	21.2	4.36	0.037
Had difficulty stopping eating	30	12.9	13	9.7	17	17.2	2.21	0.138
Ignored/broke a curfew set by my organisation	29	12.4	14	10.4	15	15.2	0.765	0.383
Been in two or more sexual relationships at the same time	28	12.0	13	9.7	15	15.2	1.13	0.289
Went to areas/neighbourhoods against the recommendation of my organisation	24	10.3	11	8.2	13	13.1	1.01	0.315
Used marijuana	24	10.3	12	9.0	12	12.1	0.323	0.515
Bought expensive items you could not afford on the spur of the moment	20	8.6	8	6.0	12	12.1	2.02	0.156*
Bought drugs	17	7.3	9	6.7	8	8.1	0.020	0.800*
Got in a physical fight	11	4.7	8	6.0	3	3.0	0.538	0.362*
Abused prescription medication	11	4.7	3	2.2	8	8.1	3.12	0.058*
Ran red lights or ignored stop signs	11	4.7	8	6.0	3	3.0	0.538	0.362*
Shoplifted things	8	3.4	6	4.5	2	2.0	0.428	0.472*
Used cocaine or crack	8	3.4	3	2.2	5	5.1	0.642	0.290*
Abused multiple drugs at once	7	3.0	3	2.2	4	4.0	0.167	0.462*
Had sexual relations with a beneficiary	7	3.0	7	5.2	0	0.0	3.69	0.002
Bet on sports, horses or other animals	7	3.0	5	3.7	2	2.0	0.136	0.702*
Gone to work intoxicated	7	3.0	5	3.7	2	2.0	0.136	0.702*
Punched or hit someone with a fist or object	7	3.0	5	3.7	2	2.0	0.136	0.702*
Threatened to physically hurt someone	6	2.6	5	3.7	1	1.0	0.771	0.245*
Used hallucinogens, LSD, magic mushrooms	6	2.6	4	3.0	2	2.0	0.002	1.00*
Asked for one of my organisation's drivers to break/ignore curfew	6	2.6	5	3.7	1	1.0	0.771	0.245*
Played lotteries, card games for money, or went to the casino	5	2.1	4	3.0	1	1.0	0.326	0.398*
Destroyed or vandalised property	3	1.3	2	1.5	1	1.0	0.000	1.00*
Paid for sex	3	1.3	3	2.2	0	0.0	0.829	0.264*
Gambled illegally (not part of a legal business)	3	1.3	3	2.2	0	0.0	0.829	0.264*
Had sex for money or drugs	2	0.9	2	1.5	0	0.0	0.253	0.509*
Attacked someone with a weapon, such as a knife or a gun	2	0.9	2	1.5	0	0.0	0.253	0.509*
Threatened someone with a weapon, such as a knife or a gun	2	0.9	2	1.5	0	0.0	0.253	0.509*
Lost more money than you could afford gambling	1	0.4	1	0.7	0	0.0	0.000	1.00*
Robbed someone	1	0.4	1	0.7	0	0.0	0.000	1.00*
Stole money	1	0.4	1	0.7	0	0.0	0.000	1.00*
Sold drugs	0	0	–	–	–	–	–	–

χ^2 = chi-square test of independence (with Yates' Continuity Correction); p = level of statistical significance, all chi-square tests have one degree of freedom. *Where cell frequency was less than 10, Fisher's Exact Probability Test is reported.

3. Results

Participants experienced a mean of 4.03 humanitarian-work related PTEs (*Mdn* = 4.00, *SD* = 2.88, Range = 0–13), with females (*M* = 4.69, *SD* = 2.61) experiencing significantly more PTEs than males (*M* = 3.53, *SD* = 2.96), ($t(231) = -3.08, p < .001, d = 0.41$). Almost all humanitarian aid workers experienced at least one PTE in their occupation (97.4 %, *n* = 226); approximately three-quarters (74.6 %, *n* = 173) experienced two or more PTEs; and 39.4 % (*n* = 81) reported experiencing five or more work-related PTEs. Frequencies of exposure to each PTE, disaggregated by sex, are reported in Table 2. The most reported events were being ‘a situation that was very frightening’ (72.1 %, *n* = 168), ‘handling dead bodies’ (49.8 %, *n* = 116), and ‘emergency evacuation’ (42.9 %, *n* = 100). Female respondents were more likely to have experienced ‘a situation that was very frightening’, ‘emergency evacuation’, ‘face hostility from a host population’, ‘encounter a situation where your life was in danger’, ‘an armed robbery or attack’, and ‘rape or sexual assault’. Males, on the other hand, were more likely to have experienced ‘handling of dead bodies’. Overall, 12.9 % (95 % *CI* = 8.5 %, 17.2 %) of humanitarian aid workers met the diagnostic requirements for PTSD, and a further 8.6 % (95 % *CI* = 5.0 %, 12.2 %) met requirements for CPTSD.

The mean number of risk-taking behaviours was 2.25 (*Mdn* = 1.00, *SD* = 3.38, Range = 0–18), with the most reported behaviours being ‘impulsively bought stuff you did not need and won’t use’ (23.2 %, *n* = 54), ‘drank 5 or more alcoholic drinks in 3 hours or less’ (21.9 %, *n* = 51), and ‘driving 48kph or faster over the speed limit’ (20.6 %, *n* = 48). Frequencies for each risk-taking behaviour, disaggregated by sex, are reported in Table 3. Females were significantly more likely than males to endorse ‘impulsively bought stuff you did not need and won’t use’, ‘having unprotected sex with someone you just met or did not know well’, and ‘ate a lot of food when not hungry’. Males, on the other hand, were more likely than females to endorse ‘drove 48kph or faster over the speed limit’ and to have ‘had sexual relations with a beneficiary’.

The mean suicidality score was 0.20 (*Mdn* = 0, *SD* = 0.57, range = 0–4). In total, 12.5 % (*n* = 29) reported having thoughts about dying by suicide, 3.0 % (*n* = 7) reported making a plan, 3.9 % (*n* = 9) had engaged in non-suicidal self-injury, and 0.9 % (*n* = 2) had made a suicide attempt.

The standardised and unstandardised regression coefficients for the model of risk-taking behaviours are reported in the Table 4. The 13 predictor variables explained 41.7 % of variance in risk-taking behaviours ($F(13, 216) = 11.89, p < .001$). Higher levels of risk-taking behaviours were significantly associated with being an expatriate/

international staff member ($\beta = 0.39, p < .001$), being exposed to a higher number of PTEs ($\beta = 0.26, p < .001$), higher levels of extraversion ($\beta = 0.25, p < .001$), higher levels of CPTSD symptoms ($\beta = 0.17, p = .027$), being male ($\beta = -0.16, p = .011$), and higher levels of neuroticism ($\beta = 0.12, p = .043$).

The results of the multiple linear regression model of suicidality are presented in Table 5. The 13 predictor variables explained 24.2 % of the variance in suicidality scores ($F(13, 216) = 5.30, p < .001$). Higher levels of suicidality were associated with being an expatriate/international staff member ($\beta = 0.24, p = .013$), and higher levels of dissociation ($\beta = 0.21, p = .015$).

4. Discussion

Facing chronic work and environmental related stress, largely within resource-constrained and often dangerous conditions, while having to tend to the many urgent needs of the communities they serve, humanitarian aid workers and volunteers are often cited as being at increased risk of physical and psychological injury [44]. As an often overlooked population within the trauma literature [45], the present study first set out to assess the frequency of exposure to humanitarian work-related PTEs, post-traumatic distress, risky behaviours, and suicidality in a global sample of humanitarian workers, which included expatriate/international, national, and volunteer staff located across 52 different countries. This study further set out to identify correlates of risk-taking behaviour and suicidality across several individual factors, trauma exposure, social support, and mental health problems.

Aligned with previous research on humanitarian relief workers [8,14,24], the rate of work-related trauma exposure reported in the present sample was high, with the average participant experiencing four work-related PTEs. Female respondents indicated exposure to a greater number of PTEs, with qualitative differences between the types of PTEs more commonly experienced by males and females highlighting some of the more gendered risks of humanitarian work. Consistent with previous research [11,14,46], approximately one in five participants met the criteria for a trauma-related disorder (12.9 % for PTSD and 8.6 % for CPTSD). By comparison, results from the World Mental Health (WMH) Survey suggest that the twelve-month prevalence of PTSD among the general population is 1.1 % (*n* = 51,295) [25]. In terms of suicidality, the proportion of respondents in the present sample reporting suicidal ideation, plans, and attempts were 12.5 %, 3.9 %, and 0.9 % respectively. While not directly comparable given that the present sample was assessed from ‘anytime while acting as a humanitarian aid worker’, the

Table 4
Multiple linear regression results predicting risk-taking behaviours among humanitarian workers.

	Unstandardised Coefficients		95 % Confidence Intervals		Standardised Coefficients		
	B	SE	Lower Bound	Upper Bound	β	t	p-value
Sex	-1.11	0.43	-1.95	-0.26	-0.16*	-2.58	0.01
Age	-0.04	0.03	-0.01	0.01	-0.11	-1.61	0.11
Years working as HAW	-0.05	0.03	-0.12	0.02	-0.10	-1.44	0.15
Cadre	2.68	0.58	1.54	3.82	0.39**	4.65	<0.001
Openness	0.12	0.11	-0.10	0.35	0.06	1.06	0.29
Conscientiousness	-0.16	0.11	-0.37	0.05	-0.09	-1.51	0.13
Extraversion	0.48	0.11	0.26	0.69	0.25**	4.37	<0.001
Agreeableness	-0.16	0.12	-0.39	0.08	-0.07	-1.31	0.19
Neuroticism	0.21	0.10	0.01	0.40	0.12*	2.03	0.04
Social Support	0.00	0.01	-0.02	0.03	0.02	0.35	0.72
PTE Exposure	0.30	0.08	0.14	0.47	0.26**	3.62	<0.001
CPTSD	0.06	0.03	0.01	0.12	0.18*	2.22	0.03
Dissociation	-0.01	0.04	-0.09	0.08	-0.01	-0.18	0.85

* $p < .05$, ** $p < .001$ / Results with a significance of $p < .001$ are aligned to a more stringent cut-off to account for the possibility of a Type I error due to multiple comparisons. HAW = humanitarian aid worker; sex: 0 = males, 1 = females; cadre: 0 = national/volunteer staff, 1 = expatriate/international staff; Personality traits measured using ultra-short form of the Big-Five Inventory (BFI-10) [27]; Social Support measured using the Multidimensional Scale of Perceived Social Support (MSPSS) [35]; PTE Exposure using a checklist of potentially traumatic events specific to humanitarian work; PTSD and CPTSD measured using the International Trauma Questionnaire [7] (ITQ); Dissociation was measured using Dissociative Symptoms Scale (DSS-8) [41,42]; Risky Behaviour was assessed using the Risky, Impulsive and Self-Destructive Behaviour Questionnaire [43] (RISQ).

Table 5
Multiple linear regression results predicting suicidality among humanitarian workers.

	Unstandardised Coefficients		95 % Confidence Intervals		Standardised Coefficients		
	B	SE	Lower Bound	Upper Bound	β	t	p-value
Sex	-0.04	0.08	-0.21	0.12	-0.04	-0.50	0.62
Age	-0.00	0.01	-0.01	0.01	-0.06	-0.71	0.48
Years working as a HAW	-0.01	0.01	-0.02	0.01	-0.08	-1.00	0.32
Cadre	0.28	0.11	0.06	0.50	0.24*	2.52	0.01
Openness	0.02	0.02	-0.02	0.07	0.07	1.03	0.30
Conscientiousness	0.00	0.02	-0.04	0.04	0.01	0.09	0.93
Extraversion	0.02	0.02	-0.02	0.06	0.07	1.05	0.29
Agreeableness	-0.01	0.02	-0.06	0.03	-0.03	-0.48	0.63
Neuroticism	0.01	0.02	-0.03	0.05	0.04	0.61	0.54
Social Support	-0.00	0.00	-0.01	0.00	-0.03	-0.51	0.61
PTE Exposure	0.03	0.02	-0.01	0.06	0.13	1.62	0.11
CPTSD	0.01	0.01	-0.00	0.02	0.12	1.34	0.18
Dissociation	0.02	0.01	0.00	0.04	0.21*	2.46	0.02

* $p < .05$, ** $p < .001$. Results with a significance of $p < .001$ are aligned to a more stringent cut-off to account for the possibility of a Type I error due to multiple comparisons. HAW = humanitarian aid worker; sex: 0 = males, 1 = females; cadre: 0 = national/volunteer staff, 1 = expatriate/international staff; Personality traits measured using ultra-short form of the Big-Five Inventory (BFI-10) [27]; Social Support measured using the Multidimensional Scale of Perceived Social Support (MSPSS) [35]; PTE Exposure using a checklist of potentially traumatic events specific to humanitarian work; CPTSD measured using the International Trauma Questionnaire [7] (ITQ); Dissociation was measured using Dissociative Symptoms Scale (DSS-8) [41,42]; Suicidality was assessed using four relevant items of the Risky and Self-Destructive Behaviour Questionnaire [43] (RISQ).

twelve-month prevalence of the same indicators in the WMH survey for 'developed' countries were 2.0 %, 0.6 % and 0.3 %, and 2.1 %, 0.7 % and 0.4 % for 'developing' countries [26].

To the best of our knowledge, this is the first study to investigate the presence of CPTSD as well as correlates of risk-taking behaviours and suicidality among humanitarian aid workers. Our results suggest that suicidality was associated with international status and higher levels of dissociation and that risk-taking behaviours are higher in males, international staff, those exposed to a higher number of work-related PTEs, those with higher levels of trait neuroticism and extraversion, and higher levels of CPTSD symptoms. The finding that trauma exposure and associated symptomology (i.e., CPTSD) was associated with increased risk-taking is consistent with a vast body of literature citing that trauma exposure causes elevated risk-taking behaviours [47] and suggests that risk-taking behaviour might signal a need for mental health support among humanitarian workers. Specifically, alcohol use as a form of risk-taking behaviour, particularly among international staff [48], is consistent with previous research noting high levels of alcohol use among humanitarian workers even in instances where, overall, humanitarian aid workers were found to experience no change in negative mental health outcomes post-assignment [8,11,13,44].

That said, there were large differences in the proportion of (predominantly Iranian) national staff endorsing alcohol consumption compared to international staff (12 % vs. 88 %), which, and consistent with previous findings [48], highlights a need to consider possible socio-cultural differences in risk-taking behaviours. Similarly, and given that acts of suicide are forbidden in Islamic cultures [49], observed differences between national and international staff on measures of suicidality in the current study may also be explained by socio-cultural differences present in the current sample. Given that risk taking behaviour may also depend on the type(s) of event(s), or stressor(s), experienced [50], further research is needed to investigate how specific events differentially affect humanitarian workers.

Our findings are also consistent with wider literature reporting that male sex is known to be associated with more 'externalising' presentations of mental distress, including antisocial behaviour and abuse of alcohol and drugs [27]. Moreover, and despite some criticism of a categorical approach to personality assessment [28], personality assessment could offer relevant information about the proclivity of individuals' towards specific coping styles, wellbeing indicators, and stress responses [29], with the potential to enhance tailoring and targeting of supports and interventions for humanitarian workers [51].

Inconsistent with previous findings [12,48], perceived social support

among humanitarian workers was not found to account for risk-taking and suicidality in the current sample. While an unexpected finding given the previously reported role of social support in mitigating the risk of psychological distress among disaster responders [34], a 2021 meta-analysis conducted by Zalta et al. suggests a more complex relationship between social support and trauma-related symptomology, whereby social support may, in part, depend on the nature of the traumatic event [52]. Moreover, notably absent from our measure of social support were questions pertaining to perceived *organisational* support, which is thought to play a critical role in the mental health and wellbeing of humanitarian aid workers [10]. For instance, offering sufficient training and preparedness, ensuring proactive communication and timely dissemination of psychosocial information, applying supportive supervision practices, and cultivating a culture of organisational safety have all been recognised as key policies and practices that can help safeguard the mental health and wellbeing of humanitarian workers [31,32,53,54]. Additionally, Aldamman et al. [22] found that the relationship between perceived organisational support and mental health outcomes among humanitarian workers in Sudan was fully mediated by perceived helplessness and perceived self-efficacy. Further longitudinal studies are needed, however, to explore how socioenvironmental conditions (e.g., regular trauma exposure, environmental insecurity, type of PTE) interact with both individual and occupational/workplace (social support at work, organisational support) factors to influence the risk of adverse mental health outcomes among humanitarian aid workers.

The capacity of humanitarian organisations to adequately respond to their staff and volunteers experiencing psychological distress ultimately depends on an organisational culture that acknowledges and actively attempts to mitigate these risks [45]. Mental health stigma remains prevalent among first responders [55], and, when combined with a workplace culture of 'self-reliance' and fears that seeking help from their organisation might cast doubt on their fitness to work, this is believed to contribute to significant delays in help-seeking among humanitarian workers facing psychological distress [56]. Accordingly, to better meet their 'duty of care' obligations to their staff and volunteers, humanitarian organisations must increasingly promote positive coping strategies and personal help-seeking (both internal and external to the organisation) and invest in ways to identify early warning signs of distress among their staff and volunteers alike [56].

5. Limitations

The current study is not without limitations. Firstly, reluctance to

disclose certain risk-taking behaviours (e.g., drug and alcohol use, extramarital sex), especially within contexts where such behaviours are severely punished (e.g., Iran), may have led to under-reporting of risky behaviours. Relatedly, opioid use was not included in the list of risk-taking behaviours in the Iranian sample. Additionally, the trauma exposure checklist used excluded other PTEs that might be associated with immediate or subsequent risk-taking behaviours (e.g., witnessing rape, torture, mass violence, death) or moral injury. Future research conducted among this sample may therefore want to expand this list to include these additional items, thereby broadening our understanding of what constitutes trauma exposure in the humanitarian sector. Similarly, and like other PTE checklists (e.g., ITEM [57], LEC-5 [58], IES-R [59]), total PTE score in the current study serves as a proxy indicator of ‘single exposures to different types of PTEs’ and provided no indication of frequency of exposure to the same event.

Other types of socio-culturally influenced, adverse behavioural outcomes associated with trauma exposure may not have been captured by the present study. Moreover, the cross-sectional nature of our design implies that the directionality and causal nature (if any) of associations cannot be ascertained. The online, self-selecting nature of the study may have resulted in selection bias and our sample was also biased demographically, given that approximately 50 % of respondents were based in Iran. Scales translated into Persian for the purposes of this study did not undergo psychometric testing. Relatedly, more recent research has called into question the validity of the BFI-10 among respondents based in the Global South [60]. Data collection taking place during the COVID-19 pandemic may have also had an impact on participant responses, potentially through impacting on participants’ perceived social support [61]. Finally, given that other mental health symptomologies (e.g., depression) as well as adverse childhood experiences have been shown to increase likelihood of engaging in risky behaviours [36] and suicidality [62], and given the cumulative impact of trauma exposure [37], a key limitation of this study is that our findings do not account for mental health history nor the role of trauma over and above trauma experienced in the context of humanitarian work.

6. Conclusions

Despite its limitations, this study contributes towards addressing a gap in research by examining the presence of CPTSD, as well as the adverse behavioural outcomes of risky behaviour and suicidality among a wide range of international humanitarian workers. Nonnegligible rates of CPTSD, risky-behaviours, and suicidality were reported, and psychosocial correlates for the latter identified. In addition to bearing a duty of care towards beneficiaries, humanitarian organisations also bear a duty of care towards their workers – professional and volunteer – many of whom themselves are from populations affected by humanitarian crises. Our findings point to a need to promote more positive coping mechanisms among humanitarian workers and adds to a growing body of literature calling for stronger occupational health supports for humanitarian workers.

CRedit authorship contribution statement

Frédérique Vallières: Writing – original draft, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Aïne Travers:** Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Hamed Seddighi:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Data curation. **Peter Varah:** Resources, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Nana Wiedemann:** Writing – original draft, Resources. **Cecilie Dinesen:** Methodology, Data curation. **Kinan Aldamman:** Formal analysis, Conceptualization. **James Lee:** Methodology, Investigation, Conceptualization. **Bonnix Kayabu:** Conceptualization. **Philip Hyland:** Supervision.

Data availability

Data is available upon reasonable request, for non-commercial purposes, from the corresponding author.

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