

Running head: POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID
WORKERS

The development of Posttraumatic Growth among Humanitarian Aid Workers: Trauma, Guilt,
Openness to Experience and Self-Efficacy

Livia Rebstock (6453678)

Médecins Sans Frontières – Operating Center Amsterdam (MSF-OCA)

Utrecht University, Faculty of Social and Behavioural Sciences, Clinical Psychology

Under supervision of Rolf Kleber (Utrecht University) & Joris Haagen (MSF)

& Saara Martinmäki (MSF)

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POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

Abstract

Humanitarian aid workers' mental health is a crucial factor in dealing successfully with the humanitarian crises across the globe which now affect more people and last longer on average than ever before. Earlier research has shown that humanitarian aid workers (HAWs) are at increased risk to develop Posttraumatic Stress Disorder (PTSD). However, international aid work and ongoing exposure to human suffering might also be a possible catalyst for personal growth for the aid workers. The current study tries to shed light on these opposing phenomena. It investigates the influence of PTSD and feelings of guilt moderated by self-efficacy and openness to experience on the development of Posttraumatic Growth (PTG) among HAWs from Médecins Sans Frontières (MSF). Data from 117 HAWs from Médecins Sans Frontières – Operating Center Amsterdam (MSF – OCA) were retrieved from six different online questionnaires spread over three different occasions to test the described hypothesis. The results show that feelings of guilt explained a significant variation on PTSD scores. However, the hypothesized development of PTG through guilt and PTSD moderated by openness to experience and self-efficacy was not supported. In conclusion, guilt feelings among HAWs need heightened attention due to their strong association with posttraumatic symptomatology. Additionally, further research needs to break down the complex phenomena of PTG in order to detect the potential of positive development from adverse experiences within a traumatized population.

Key words: HAWs, PTSD, guilt, openness to experience, self-efficacy, PTG

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

“Silence has long been confused with neutrality and has been presented as a necessary condition for humanitarian action. From its beginning, Médecine sans Frontières was created in opposition to this assumption. We are not sure that words can always save lives, but we know that silence can certainly kill” (Orbinski, 1999).

The 210,800 Humanitarian aid workers (HAWs) around the world are crucial to the attempt to assist the 135.3 million people in need in areas affected by natural or human-made violence worldwide („ALNAP | Home“, 2008; Global Humanitarian Overview, 2018). The working environment of HAWs is continuously developing, defined by disease outbreaks, natural disasters and political instability, which requires constant adjustment to the changing environment. Accordingly, HAWs’ physiological health and mental well-being must be at its optimum to be best prepared to handle this challenging exposure to traumatic events and human suffering (Jachens, Houdmont, & Thomas, 2018). Nevertheless, there is accumulating evidence that HAWs are at an increased risk of psychological vulnerability, resulting in anxiety, burnout, depression and Posttraumatic Stress Disorder (PTSD) (Lopes Cardozo et al., 2012). For example, in an internal survey, HAWs from MSF-OCA showed a post-mission prevalence for anxiety and depression of 26% each compared to the lifetime prevalence of 15% and 11.7 % respectively for the general population (Kessler, Chiu, Demler, & Walters, 2005; Kessler et al., 2009; Psychosocial Care Unit MSF Amsterdam, 2014). Furthermore, HAWs from the United Nations High Commissioner for Refugees (UNHCR) report a prevalence rate of 36% for PTSD compared to 8% in the general population (Connorton, Perry, Hemenway, & Miller, 2012; Lopes Cardozo et al., 2012).

These findings show that the possibility for HAWs to develop depression, anxiety or PTSD immediately after a mission is highly increased even in comparison to the prevalence of the general population spread over a singular lifetime. This is potentially worrying and may be explained by the experience of traumatic events through direct victimization and / or threat

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

of injury, as well as indirect traumatic events as HAWs work with affected local communities recovering from war, disaster, and other emergencies (Eriksson et al., 2015). Our understanding of factors influencing the development and recovery of PTSD and alike is crucial in order to protect HAWs' mental health.

Characteristic symptoms of PTSD as defined by the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM 5) include; intrusions (e.g. re-experiencing trauma related memories), avoidance (e.g. avoiding trauma-related memories), negative alterations in cognitions and mood (e.g. fear, anger, guilt), and alterations in arousal and reactivity (e.g. irritability or sleep problems) (American Psychiatric Association, 2013). Left untreated, PTSD might lead to a reduced quality of life, significant occupational and social impairment, as well as considerable personal and societal costs (Kessler, 2000). While it exceeds the aim of the current study to consider all these aspects of PTSD in detail, the present paper focuses mainly on guilt as an important, yet often neglected feature of PTSD.

Guilt may emerge when a traumatic event appears inconsistent with an individual's self-concept and is seen to violate personal standards or values leading to guilt-charged disturbing thoughts and ruminative activity (Kubany et al., 1996). The degree to which one experiences these may depend on beliefs held about the personal involvement in the traumatic event, such as perceived responsibility, preventability and lack of justification following the traumatic event (Kubany et al., 1996). Further, posttraumatic guilt can appear in several dimensions: on the one hand, survivor guilt describes the mental condition that occurs when one feels guilty for surviving a traumatic event while other people involved died. The unspoken thought connected to survivor guilt is the feeling of relief and happiness about surviving the jeopardy of a trauma that took the lives of others. On the other hand, bystander guilt describes the phenomenon in which the survivor feels deep regret or self-condemnation over failure to help fellow survivors during or after the trauma (Wilson, Droždek, &

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

Turkovic, 2006). Thus, it is important to consider guilt in the context of PTSD and feelings of guilt need further attention in humanitarian aid organisations.

Past research from the armed forces has shown that combat-specific guilt is significantly associated with posttraumatic stress symptomology (Browne, Evangeli, & Greenberg, 2012). More recently, Bub and Lommen (2017) investigated guilt feelings in a laboratory setting with a non-clinical student sample. Participants faced a stressor in form of a computer crash. They were either personally blamed for causing the incident or were told that it was a technical failure and not their fault. Feelings of guilt, as well as the number of intrusive thoughts and associated distress, were significantly higher in the blame group. These laboratory results support previously mentioned findings that guilt experienced in reaction to a traumatic event may be part of a causal mechanism driving the development of PTSD (Bub & Lommen, 2017).

Besides the obvious negative psychological aspects of exposure to trauma and human suffering for humanitarian aid workers, findings suggest that exposure to human suffering could also be a possible catalyst for personal growth (Shaw, Joseph, & Linley, 2005). For example, in a study of 1287 male veterans of World War 2 and the Korean War, Aldwin, Levenson and Spiro (1994) found that veterans who perceived benefits from their combat experiences were less likely to suffer from symptoms of PTSD. Furthermore, Aldwin et al. (1994) observed maturational effects, broadened perspectives, enhanced coping skills as well as increasing self-discipline and independence after exposure to war and combat. It has even been observed that working through negative feelings such as guilt and shame accompanied by constant rumination might help to reach some sort of internal acceptance. Supposedly, guilt and shame first prevent self-forgiveness, but then remorse and regret experienced during guilt help motivate behaviours oriented toward positive outcomes in form of reparative action (Hall & Fincham, 2005). Again, there is a paucity of research on personal growth after traumatic experiences among HAWs (Jachens, Houdmont, & Thomas, 2018). Thus, the

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

present study also tries to shed light on the phenomenon of Posttraumatic Growth (PTG) among HAWs and by that tries to encourage positive change among trauma survivors.

PTG has been defined as “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004). Many researchers agree that these positive transformations in beliefs and behaviour can be manifested in at least five forms: improved relations with others, identification of new possibilities for one’s life, increased perception of personal strength, spiritual growth and enhanced appreciation of life (Jayawickreme & Blackie, 2014). The degree of such transformations in beliefs and behaviour has been identified to be positively influenced by openness to experience and self-efficacy (Joseph, Murphy, & Regel, 2012; Linley & Joseph, 2004; Tedeschi, Park, & Calhoun, 1998). The individual who is more open to experience – imaginative, emotionally responsive, and intellectually curious – might be particularly likely to meet the challenge of adversity through a philosophical re-orientation and a new direction in life plans (Tedeschi, Park, & Calhoun, 1998). Self-efficacy might support PTG by replacing the automatic, dysfunctional rumination into a more deliberative, reflective rumination leading to resolution of incompatibility between new-trauma related information and pre-existing assumptive worlds (Tedeschi, Park, & Calhoun, 1998).

Up to now, the mentioned studies demonstrate both the role of guilt in PTSD and the relevance of PTG influenced by openness to experience and self-efficacy in a variety of traumatized populations, such as war veterans. Remarkably, there is little knowledge about the mental health of HAWs, posing the question what keeps them healthy despite the stressors they have to face during their missions and which interventions might facilitate this process. This paper aims to specifically examine the role of guilt in PTSD among HAWs and whether openness to experience and self-efficacy play a crucial role in PTG among HAWs as well. It was hypothesized that (1) scores on the questionnaire measuring PTSD correlate positively with the guilt items from the questionnaires measuring PTSD, anxiety and depression and

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

burnout. Furthermore, it was hypothesized that (2) HAWs who experience symptoms of PTSD and guilt can experience PTG two months later at follow-up, if they score rather high on openness to experience and self-efficacy (Figure 1). PTG is indicated by increased scores in a questionnaire measuring work engagement at follow-up compared to before the mission.

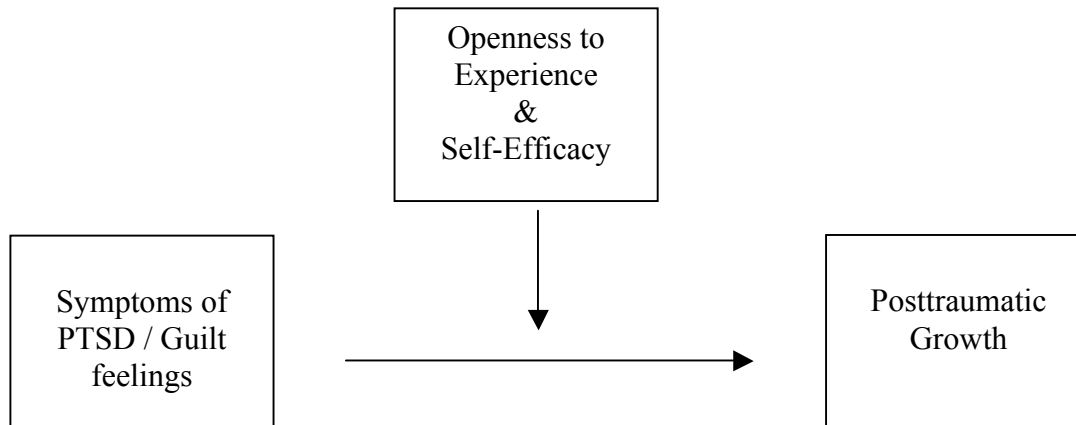


Figure 1. Model predicting Posttraumatic Growth through PTSD and guilt moderated by self-efficacy and openness to experience

Method

Design

The present study is part of the overall *MSF Expat Health and Well-being Study* conducted by the Arq Psychotrauma Expert Group and Médecins Sans Frontières. The health of HAWs is a focal point of MSF's work, hence a 3-year research project was started to understand the psychological and physical health of MSF HAWs before they go on a mission as well as after they have returned. The current study included all participants who had completed the study by the end of January 2019 in order to examine the correlation of guilt with PTSD and their relationship with PTG moderated by openness to experience and self-efficacy among HAWs. This study received ethical approval by the ethics review board of MSF.

Participants

All HAWs who went through MSF-OCA for their briefing before their mission were automatically invited to participate in the MSF Expat Health and Well-being Study and

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

sought to participate voluntarily. The amount of necessary participants was calculated with a G-Power analysis which resulted in a R^2 value equal to 0.27, which corresponds to an f^2 value of 0.37 with an alpha error probability of 0.05. The expected power of the test was 0.95 and the critical F was 2.09 with 8 degrees of freedom for the numerator and 61 degrees of freedom for the denominator. Therefore, at least 70 participants had to be included. Figure 2 explains the selection process from the initial amount of 576 participants to the final sample size of 117 participants (39 males, 78 females) which was sufficient for the conducted G-Power analysis.

Initial amount of participants

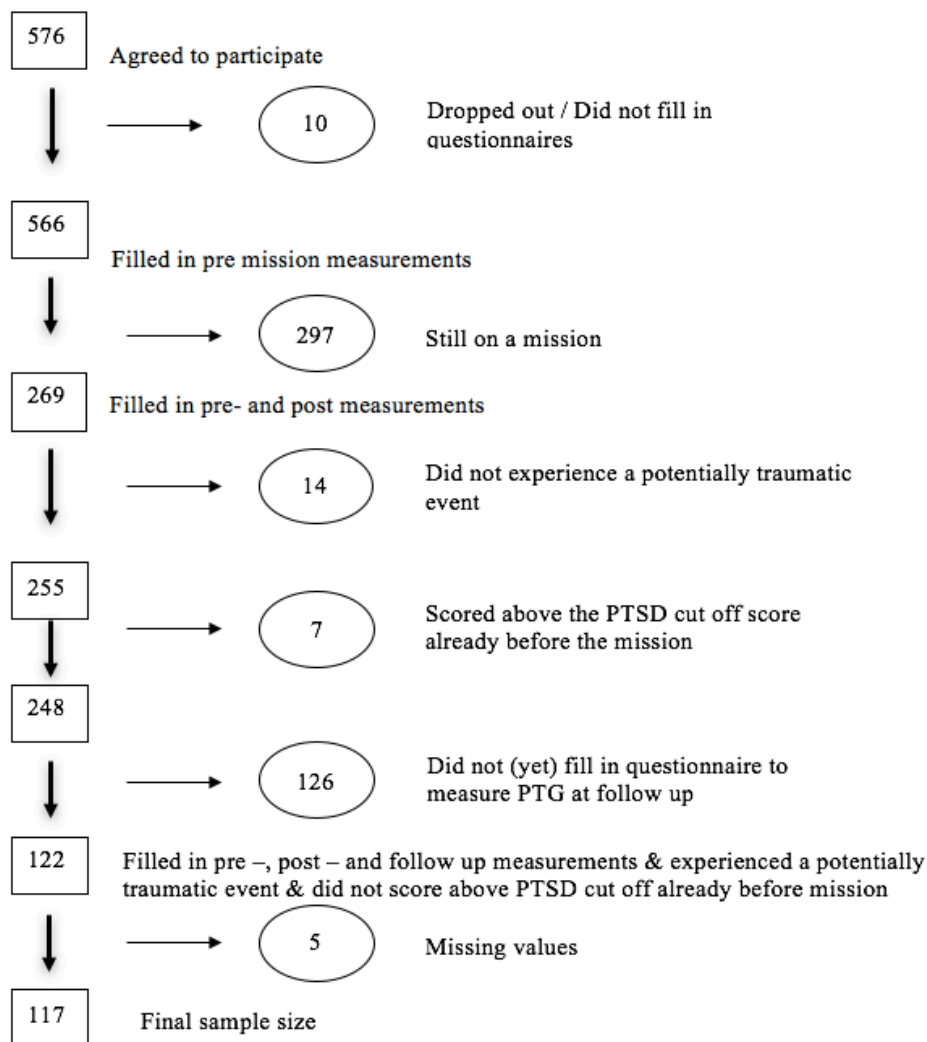


Figure 2. Flow diagram of the selection procedure

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

The mean age of the sample was 39.5 years ($SD = 12.79$) with a minimum age of 24 and a maximum age of 76. Nationalities varied greatly with the most frequent countries of origin being Canada and Germany (12 participants each), UK (11 participants) and the Netherlands and the U.S. (10 participants each). The variety of continents of origin from the included participants can be seen in Figure 3. HAWs from MSF-OCA are sent into countries all around the globe. In 2018, participants from this study were located among others in Libya, Nigeria, Syria, Bangladesh, Myanmar, and DRC. Support was provided to people suffering from varying crises such as natural disaster, conflict and war as well as to refugees and displaced people. Therefore, the current sample was very heterogeneous in regard to mission location, type of disaster and recipients of help.

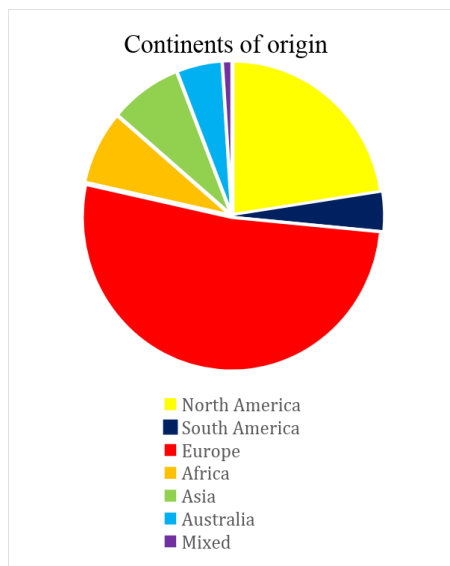


Figure 3. Continents of origin of participants

Instruments

The following instruments were chosen from the already existing pool of questionnaires from the overall *MSF Expat Health and Well-being Study* conducted by Arq and MSF:

BFI Personality. The Big Five Inventory (BFI) is a self-report inventory designed to measure an individual on the Big Five dimensions of personality consisting of 44 items (Goldberg, 1993). The so called Big Five dimensions consist of extraversion vs. introversion,

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

agreeableness vs. antagonism, conscientiousness vs. lack of direction, neuroticism vs. emotional stability and openness vs. closeness to experience. Openness to experience was the only dimension of interest for the current study which is tested with statements such as, “I see myself as someone who is original, comes up with new ideas”. Respondents were asked how much they can relate to these characteristics and had to rate the statements accordingly on a 5-point Likert scale from 1 (*disagree strongly*) to 5 (*agree strongly*). The BFI Personality showed good psychometric properties. In U.S. and Canadian samples, the alpha reliabilities of the BFI scales ranged from .75 to .90 and average above .80. Three-month test-retest reliabilities ranged from .80 to .90 with a mean of .85 (Rammstedt & John, 2005; 2007).

Coping Self-Efficacy Scale. The Coping Self-Efficacy Scale (CSE) provides a measure of a person's perceived ability to manage one's personal functioning and the countless environmental demands of the aftermath of a traumatic event (Benight & Bandura, 2004). The present study used the Brief Coping Self-Efficacy Scale (BCSE) consisting of 7 items, adapted from the 20-item version (Bosmans et al., 2017). The questionnaire describes 7 issues related to the traumatic experience and the respondents were asked to rate how confident they think they are in successfully dealing with them. The answer possibilities ranged from 1 (*I'm not at all capable*) to 7 (*I'm totally capable*). A person scoring high on this questionnaire is presumed to deal well with all the consequences of shocking events and is able to return to one's normal life without severe mental consequences (Benight & Bandura, 2004). Exploratory factor analyses have shown that the seven selected items load on a single factor, explaining 64.96 % of its variance, with all item loadings above .71. Confirmatory analyses have found a single factor as well, with explained variances ranging from 57.79% to 65.93% and all factor loadings were above .59. Moreover, the CSE-7 has the advantage of an identical factor structure across very different samples which was highly beneficial for the present study (Bosmans et al., 2017).

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

PCL-5. The PTSD Checklist for DSM-5 (PCL-5) is a 20 item self-report measure that assesses the presence and severity of PTSD symptoms developed by Weathers, Litz, Keane, Palmieri, Marx, and Schnurr (2013). Respondents were asked to rate to which extent they experienced symptoms described by 20 items in the past month on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Items are summed to provide a total severity score (range = 0 – 80). The present study was interested in all statements in order to receive an overall score for PTSD and specifically interested in two items measuring guilt feelings (see below paragraph guilt score). A total score of 33 is commonly used as a cut-off score and suggests that the patient may benefit from PTSD treatment (Weathers et al., 2013). The PCL-5 is a psychometrically sound measure of DSM-5 PTSD. It is valid and reliable, useful in quantifying PTSD symptom severity, and sensitive to change over time in military service members and undergraduate students. PCL-5 scores have excellent internal consistency (alpha = .96) and the test-retest analysis revealed a reliability of $r = .84$ (Weathers et al., 2013).

HSCL 25 (Depression & Anxiety). The Hopkins Symptom Checklist (HSCL) (Parloff, Kelman & Frank, 1954) is a widely used self-report inventory and comprises of 10 items regarding anxiety symptoms, 13 depressive symptoms and 2 somatic symptoms. Respondents had to indicate what complaints they have suffered from the last seven days and rate it on a scale from 1 (*not at all*) to 2 (*rarely*) over 3 (*sometimes*) and finally 4 (*often*). For the current study, only the item “Blaming yourself for things”, was of interest for the self-constructed guilt score. A high score on this item might indicate that the HAW blames himself / herself for things that happened on the mission.

MBI (Burn Out). The Maslach Burnout Inventory (MBI) invented by Maslach in the 1980s measures burnout. It describes a syndrome of emotional exhaustion, depersonalisation and reduced personal accomplishment (Maslach, Jackson, & Leiter, 1997). The current study used only the item “I feel recipients blame me for some of their problems” as part of the guilt score. Respondents were supposed to answer on a scale from “0” (if they never experienced

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

this feeling related to their job) to “6” (if they feel that way every day). A high score on the item of interest might indicate that the HAW feels blamed for problems of his / her recipients from the past mission.

Utrecht Work Engagement Scale (UWES). The UWES, a self-report questionnaire, was developed by Schaufeli, Salanova, Lez-Roma, & Bakker (2002) to measure work engagement, which is thought to be the opposite of burnout. In order to avoid overextension and to reduce attrition rate as much as possible the present study used an adapted version of the original UWES-17, namely UWES-9 (Schaufeli, Bakker, & Salanova, 2006). All 9 items are scored on a 7-point frequency rating scale ranging from 0 (*never*) to 6 (*always*). Participants with high scores tend to be engaged employees who feel energetically connected to their work and see themselves as able to deal well with the demands of their job (Schaufeli et al., 2002). Here, the UWES was used as an indicator of PTG as it emphasizes that the humanitarian aid workers scoring high on UWES have developed beyond their previous level of adaptation and psychological functioning within their work. The original UWES-17 has encouraging psychometric features for its scores. For instance, internal consistencies typically range between .80 and .90. The shortened versions of the scale correlated highly with their original longer counterparts, sharing more than 80% of their variances. The same accounts for the remaining psychometric properties (Schaufeli, Bakker, & Salanova, 2006).

Self-constructed guilt score. For the purpose of clarity, table 1 explains once more how the self-constructed guilt score was developed:

Table 1

Self-constructed guilt score

Questionnaire	Item
PCL-5	i. Strong negative feelings such as fear, horror, anger, guilt, shame
	ii. Blaming yourself or someone else for the stressful experience or what happened after it
HSCCL 25	iii. Blaming yourself for things
MBI	iv. I feel recipients blame me for some of their problems

Note. Overall, this makes four different items from three different questionnaires in order to construct a guilt score for the present study.

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

A Pearson's product-moment correlation was run to assess the validity of the self-constructed guilt score. Preliminary analysis showed the relationship to be linear with all four items normally distributed, as assessed by visual inspection of Normal Q-Q Plots and there were no outliers. All in all, correlations were statistically significant and positive, thus we can consider the current guilt score as a representation of guilt feelings. Correlation coefficients and significance level for the guilt items comprising the guilt score can be found in table 2.

Table 2

Correlation matrix for guilt items

		Item i.	Item ii.	Item iii.	Item iv.
Item i.	Pearson Correlation	1	.70***	.31***	.25**
	Sig. (2-tailed)		.00	.00	.01
	N	117	117	117	117
Item ii.	Pearson Correlation	.70***	1	.24**	.22*
	Sig. (2-tailed)	.00		.01	.02
	N	117	117	117	117
Item iii.	Pearson Correlation	.31***	.24**	1	.32***
	Sig. (2-tailed)	.00	.01		.00
	N	117	117	117	117
Item iv.	Pearson Correlation	.25**	.22*	.32***	1
	Sig. (2-tailed)	.01	.02	.00	
	N	117	117	117	117

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

To confirm this finding even further, the guilt score, representing a negative state of mind, was correlated with the emotional well-being score, representing a positive state of mind, leading to the expected significant, negative correlation between the two, $r(115) = -.42, p < .001$.

Procedure

All HAWs who went through MSF-OCA before their mission were briefed about the context of the study, the aim and the purpose as well as the procedure. Additionally, all participants received a written information sheet about the study. All participants provided

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

informed consent, and could afterwards start with the electronic questionnaires in the office. Participants were free to withdraw any time.

At the first measurement (T1), participants were surveyed about their basic demographics followed by eleven questionnaires about possible factors influencing their mental and physical health. For the present study, the items / questionnaires to measure guilt, PTSD, openness to experience, self-efficacy and PTG were considered at T1. For the duration of the mission, HAWs were not contacted. The second measurement (T2) was at the debriefing in MSF-OCA after the HAW's mission. Again, HAWs were asked to fill out similar questionnaires but this time they were more related to field specific stressors. A total of thirteen questionnaires were assessed at T2 of which items in order to measure PTSD and guilt again after the mission were relevant. The follow-up questionnaires, which comprised the third measurement (T3), were sent to all participants via e-mail two months after they have been back from their mission. This time only the UWES questionnaire was examined to receive the participants' score on PTG at T3. Prior to analysis, participants who did not experience a PTE at T2 were excluded. The Life Events Checklist for DSM-5 (LEC-5) at T2 was used to screen participants for PTEs. The questionnaire asks for events such as natural disaster, transportation accidents, physical assault, sexual assault, combat or exposure to a war zone, sudden violent death, harm or death you caused to someone else. The answer options are the following: Happened to me, witnessed it, learned about it, part of my job, not sure, does not apply. Everybody who answered at least one of the events with one of the first four answer options remained in the sample.

Statistical Analysis

A Pearson's product – moment correlation was chosen to test the first hypothesis since the test fits with the current goal to examine the variance of PTSD symptoms explained by guilt feelings. The statistical tests used to test the second hypothesis was a multiple regression analysis; it was used to predict the value of PTG based on feelings of guilt and PTSD scores.

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

PTG was the dependent variable and feelings of guilt and PTSD scores were independent variables. Moreover, the moderators openness to experience and self-efficacy, were thought to further predict the level of PTG. First, the score for the moderators was calculated. For that, a mean score for openness to experience and self-efficacy was calculated. Afterwards, an overall mean for PTSD and for the four extracted guilt items at T1 and T2 were calculated. Last, the change in work engagement was calculated. The mean from the work engagement score at T1 was subtracted from the mean of the work engagement score at T3. This difference was used as an indicator of growth from experiencing a shocking event during the mission compared to before the mission. Following the statistical setting, necessary assumptions were tested prior to eventually conducting the correlation and regression analysis.

Results

Descriptive Statistics

As shown in Figure 2, all 117 participants included did experience a PTE and did not already score above the PTSD cut off score (33) prior to the mission. As seen in Table 3, the participants showed an average in PTSD symptoms of 0.45 ($SD = 0.41$) at T1 and of 0.43 ($SD = 0.45$) at T2 which indicated a low average at both time points, with a non-significant ($p = .56$) decrease in symptoms from before the mission to afterwards. Furthermore, the sample showed an average in guilt feelings of 1.06 ($SD = 0.65$) at T1 and of 0.98 ($SD = 0.71$) at T2 which indicated a low average for both with a non-significant ($p = .26$) decrease in feelings of guilt from before the mission to afterwards. At T1 participants scored with an average of 3.85 ($SD = 0.52$) for openness to experience which indicated a medium average and of 6.03 ($SD = 0.94$) for self-efficacy which indicated a high average. Finally, the sample showed an average in work engagement of 4.72 ($SD = 0.76$) at T1 and of 4.48 ($SD = 0.86$) at T3 which indicated a medium to high average for both time points with a significant ($p < .001$) decrease from

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

before the mission to follow up. The mean difference represented PTG, indicating negative growth from T1 to T3 for the current sample.

Table 3

Descriptive Statistics

Questionnaires	Mean T1 (SD)	Mean T2 (SD)	Mean T3 (SD)	Range	Change in Mean (SD)
PTSD (PCL-5)	0.45 (0.41)	0.43 (0.45)	-	0 – 4	– 0.03 (0.46)
Guilt (self-constructed from PCL-5, HSCL, MBI)	1.06 (0.65)	0.98 (0.71)	-	0 – 4 1 – 4	– 0.08 (0.73)
Openness to experience (BFI Personality)	3.85 (0.52)	-	-	1 – 5	-
Self-efficacy (CSE)	6.03 (0.94)	-	-	1 – 7	-
Work engagement (UWES)	4.72 (0.76)	-	4.48 (0.86)	0 – 6	–0.25***(0.66)

Note. $n = 117$; - not measured / not relevant; first two changes in mean score non-significant, then *** = $p < .001$

Relationship between guilt and PTSD

A Pearson's product-moment correlation was run to assess the relationship between PTSD and guilt. Preliminary analysis showed the relationship to be linear with both variables normally distributed, as assessed by visual inspection of Normal Q-Q Plots and there were no outliers. There was a statistically significant, strong positive correlation between PTSD scores and guilt scores, $r(115) = .65, p < .001$, with guilt feelings explaining 42% of the variation in PTSD scores. Therefore, we can reject the null hypothesis and accept the alternative hypothesis.

Posttraumatic Growth

A multiple regression was run to predict PTG from PTSD, guilt, self-efficacy, openness to experience and the interaction of those, namely PTSD with self-efficacy, PTSD with openness to experience, guilt with self-efficacy and guilt with openness to experience. The data were screened for violation of assumptions prior to analysis. The first two assumptions were met by the nature of the study design, namely a continuous dependent variable and several continuous independent variables. Further, there was independence of

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

residuals, as assessed by a Durbin-Watson statistic of 1.998. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. First, there was evidence of multicollinearity, as assessed by tolerance values smaller than 0.1. By standardizing the predictors, the problem of multicollinearity could be solved as assessed by tolerance values greater than 0.1. There was one studentized deleted residual greater than $+ / - 3$ standard deviations, namely 3.18. Since it only exceeded the cut off value slightly, it was not an influential point and also not a high leverage value, it was decided to remain it in the analysis. Further, there were 6 cases with leverage values greater than 0.2 which were deleted from the file accordingly and no values for Cook's distance above 1 were found. The assumption of normality was met, as assessed by a Q-Q Plot.

Contrary to expectation the model did not statistically significantly predict PTG. R^2 for the overall model was 11.4 % with an adjusted R^2 of 4.5 %. The predictors and interaction terms did not statistically significantly predict PTG, $F(8, 102) = 1.65, p = .12$. Regression coefficients and standard errors can be found in table 4.

Table 4

Summary of Multiple Regression Analysis

Variable	B	SE_B	b	p -value	95,0% Confidence Interval for B	
					Lower Bound	Upper Bound
Intercept	-0.28	0.06		.00	-0.41	-0.16
PTSD	-0.15	0.10	-0.19	.11	-0.34	0.04
Guilt	-0.10	0.09	-0.13	.27	-0.29	0.08
Openness to experience	0.09	0.07	0.12	.24	-0.06	0.23
Self-efficacy	-0.06	0.06	-0.09	.33	-0.19	0.07
Interaction terms:						
PTSD*Openness to experience	0.10	0.11	0.10	.37	-0.11	0.31
PTSD*Self-efficacy	0.00	0.13	0.00	.98	-0.26	0.25
Guilt*Openness to experience	-0.13	0.11	-0.17	.24	-0.35	0.09

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

Guilt*Self- efficacy	0.10	0.12	0.10	.42	-0.14	0.33
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Note. $n = 111$; outcome variable: PTG; due to multicollinearity all the here reported values stem from multiple regression analysis with standardized predictors; $p < .05$; $B =$ unstandardized regression coefficient; $SE_B =$ standard error of the coefficient; $b =$ standardized coefficient

Exploratory Analysis

The subscale emotional well-being was investigated as another dependent variable (see appendix for more information).

Discussion

The current study focused on factors influencing the development of PTG following shocking experiences in the field among HAWs. More specifically, the relationship between guilt, PTSD, openness to experience and self-efficacy as predictors for the development of PTG were examined in the current study. Firstly, it was hypothesized that (1) scores on the questionnaire measuring PTSD correlate positively with the guilt items from the questionnaires measuring PTSD, anxiety and depression and burnout. This hypothesis was supported by present investigations. Secondly, it was hypothesized that HAWs who experience symptoms of PTSD and guilt can experience PTG two months later at follow up, if they score rather high on openness to experience and self-efficacy. However, the results contradicted this hypothesis, as the hypothesized model did not predict the development of PTG.

Feelings of guilt in relation to traumatic experiences

The finding of a relationship between PTSD symptoms and guilt is in accordance with the growing body of literature highlighting the role of moral emotions such as guilt and shame in trauma-related outcomes for veterans. For instance, a study by Bannister, Colvonen, Angkaw, & Norman, (2019) showed that guilt variables predicted PTSD severity. Specifically, 25 % of the variance in the questionnaire measuring PTSD could be explained by guilt-related distress. The present study succeeded in replicating this relationship of guilt

and PTSD among the previously neglected population of HAWs, with 42 % of the variation in PTSD explained by guilt related cognitions. Yet, the current result needs to be treated with caution since two items appear in both, the self-constructed guilt score and in the PTSD score, hence may positively bias the correlation. Nevertheless, the current result is further consistent with growing research about moral injury; a construct that is highly related to, yet distinct from PTSD (Smigelsky, Malott, Morris, Berlin, & Neimeyer, 2018). Moral injury stems from disruption of deeply held moral beliefs or values which can be caused by exposure to traumatic events leading to “profound feelings of guilt and shame, betrayal and anger and / or a deep sense of senseless and moral disorientation” (Molendijk, 2019). Since the phenomenon of moral injury has been closely linked to the onset of guilt-based PTSD within the armed forces (Nazarov et al., 2015), emerging models of PTSD integrate acts that violate one’s sense of morality as pathological core of many combat-related PTSD cases, additionally to the previous focus of fear-based symptomatology (Molendijk, 2018). Whereas the link between guilt feelings and PTSD could be replicated by the current study, future research should examine the concept of moral injury within the humanitarian community since HAWs are exposed to similar challenges like war veterans.

Surprising outcomes regarding Posttraumatic Growth

The rejection of the second hypothesis stands in disagreement to previously mentioned literature reporting positive developments in the aftermath of combat exposure (Shaw, Joseph, & Linley, 2005; Tedeschi, Park, & Calhoun, 1998). The present paper neither revealed factors influencing the development of PTG nor indicated that PTG actually existed among HAWs in this sample. There might be several explanations for these contradicting results:

The current study was based on the assumption that PTG develops from an adverse experience, if HAWs also score high on openness to experience and self-efficacy. HAWs did indeed score relatively high on openness to experience and self-efficacy, but at the same time the PTSD and guilt scores remained surprisingly low. It seems, as if this necessary condition

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

of an adverse experience did not occur in the present sample hence PTG cannot arise from it. This is inconsistent with the fact that everybody included in the sample experienced a PTE during the mission. However, PTEs include a broad variety of potentially traumatic life events. Depending on the type of event and how it was experienced, it might not be severe enough to trigger PTSD symptomatology and guilt feelings, thus eliminates the possibility to experience PTG. This is in line with research from van Wingen, Geuze, Vermetten, and Fernández (2011) who investigated the influence of exposure to severe stressors on amygdala reactivity, a key brain region involved in threat detection and fear regulation. Their results show that it is the influence of perceived threat rather than actual combat exposure that alters amygdala regulation. These findings are in alignment with the appraisal theory which states that the cognitive appraisal of threat rather than the actual environmental stressor determines the impact of stress exposure (Solomon, Mikulincer, & Benbenishty, 1989). Perhaps the PTEs experienced by the current sample, which represent the actual environmental stressors were not subjectively perceived as threatening hence did not lead to PTSD symptoms and guilt feelings.

Further it is conceivable that PTG does actually exist in the investigated population, but the necessary instrument was not available to prove this. More precisely, the UWES as instrument to measure PTG showed that HAWs were less engaged in their work after their mission in comparison to before, contrary to expectation. Perhaps, HAWs are very excited, full of hope and energy before their mission. However, when they come back, they might feel drained, less motivated and probably even frustrated by the stressors they had to face during their mission (Jachens, Houdmont, & Thomas, 2018). This shift in attitude might have happened to the currently tested population as well, hence explaining the decrease in the work engagement scores from before the mission to follow up. Within the available questionnaires for the current study, the UWES was thought to measure PTG in the work context as accurately as possible. In future studies, broader questionnaires depicting different aspects of

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

PTG (improved relations with others, identification of new possibilities for one's life, increased perception of personal strength, spiritual growth and enhanced appreciation of life) should be used.

Limitations

A further consideration is, that humanitarian aid organisations differ in the kind of people they attract and in how well they prepare their HAWs for the expected challenges in the field. This might have an influence on HAWs' psychological vulnerability and processing of possible traumatic events. Therefore, generalization to other HAWs outside of MSF needs to be treated with caution. Furthermore, self-report questionnaires were used to assess the predictors as well as the outcome variable. It is known that self-report questionnaires suffer from biases such as socially desirable responding, problems with wording and framing of the questions, and thus might lead to biased results (Choi & Pak, 2004; van de Mortel, 2005). Especially, in the present case participants might not answer truthfully, because mental health problems are still widely stigmatized and perceived as a sign of weakness and thus HAWs probably do not want to be considered by themselves or others as mentally unstable. Moreover, it is likely that the passage of time since one experiences a PTE and the intervening events and processes during that time, influence the (non-)development of PTG (Linley & Joseph, 2004). The investigated sample may still show an increase in work engagement at an even later time point than the current follow-up measurement. Future studies should consider the temporal course of PTG and the confounding events during that time. Speaking of confounders, all participants scoring above the cut-off score for PTSD already before the mission were excluded from the study to make sure that PTSD symptomatology after the mission was actually related to mission experiences.

Implications of outcomes and suggestions for future research

The present results carry some practical and clinical implications. There is a need to educate the humanitarian aid community about guilt as one of the crucial features of PTSD,

POSTTRAUMATIC GROWTH AMONG HUMANITARIAN AID WORKERS

especially in populations with increased symptomatology. Precisely, guilt cognitions left untreated may develop into a more global and internalized feeling of shame and can eventually support the facilitation of chronic PTSD (Bannister et al., 2019). It needs heightened attention in preparation- and follow up training of HAWs, and can be integrated into organisational psychosocial prevention and intervention strategies. More specifically, early interventions focusing on moral injuries may reduce the development of guilt-based PTSD by assessing moral standards prior to deployment in order to illuminate how HAWs may emotionally respond to morally ambiguous circumstances on a mission (Nazarov et al., 2015).

Future research on guilt needs to investigate the current findings with participants from other humanitarian aid organisations. Ideally, guilt should then be measured with a validated questionnaire instead of a self-constructed guilt-score. Besides, the gap of research about PTG among HAWs needs to be tackled. Based on present findings, it is suggested to especially examine HAWs who scored above the cut-off score for PTSD as an adverse experience is needed to actually grow from it. Next, the phenomenon of PTG should be investigated with a validated questionnaire such as the PTG Inventory (Tedeschi & Calhoun, 1996) which was not available in the current pool of questionnaires. Furthermore, more research and theoretical models are needed about mediating and moderating variables of growth and future studies should seek to include structured interviews as well as self-report questionnaires.

Final Conclusion

Guilt feelings need heightened attention in the humanitarian aid community in order to reduce mental health problems, which in turn may affect the functioning and productivity of the aid organizations. Further research needs to shed light on the very complex phenomenon of PTG among HAWs in order to understand reactions to trauma in a comprehensive manner instead of a biased one by focusing exclusively on negative consequences.

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Appendix

Exploratory Analysis: emotional well-being

Initially, guilt and PTSD were thought to predict PTG, measured with the work engagement scale, moderated by openness to experience and self-efficacy. PTG was thought to be indicated by an increase in work engagement from T1 to T3. Analyses revealed the opposite, namely a decrease of work engagement from T1 to T3. Therefore, the subscale emotional well-being from the RAND questionnaire was investigated as another dependent variable. Running the analysis again with the same predictors but a new outcome variable lead to the following results: Scores on the emotional well-being scale increased from 77.48 (14.00) at T1 to 77.98 (14.90) at T3 which indicated a high average (range from 0 - 100) for both, with a mean difference from T1 to T3 of 0.58 (12.4), indicating a non-significant ($p = .61$) increase in emotional well-being from before the mission to follow up. R^2 for the overall model was 12.7 % with an adjusted R^2 of 5.9 %. The predictors and interaction terms did not statistically significantly predict emotional well-being, $F(8, 102) = 1.86, p = .07$. Although people slightly increased in their emotional well-being score from before the mission to afterwards, in comparison to the significant decrease of work engagement, the regression analysis using the same predictors remained non-significant. Since these particular findings result from exploratory analysis, they must be treated with caution.