

# Conceptualization of PTSD and comorbid symptoms in treatment-seeking veterans and refugees

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## ABSTRACT

**Background:** Refugees and veterans are both at higher risk of developing a post-traumatic stress disorder (PTSD) but it is unclear if PTSD is also constructed similar in both groups. Furthermore, may there be differences in comorbid symptoms among veterans and refugees. These possible differences might affect treatment outcomes. **Aims:** The aim of the first part of this study was to compare the conceptualizations of PTSD in veterans and refugees. The second part of the study examined differences in comorbid depressive, hostility and somatic symptoms among veterans and refugees. **Method:** Data from treatment-seeking veterans and refugees from Foundation Centrum '45 were used ( $N=365$ ). The first part of the study used Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) data to conduct Principal Component Analyses (PCA) in order to compare PTSD conceptualizations. The second part of the study used the Brief Symptom Inventory (BSI) to examine differences in comorbid symptoms. **Results:** The PCA yielded six components in the veteran sample and seven components in the refugee sample. Furthermore, multivariate analyses showed a significant difference between veterans and refugees regarding comorbid symptoms. Univariate analysis showed that refugees reported more depressive symptoms and more somatic symptoms. There was no difference found in symptoms of hostility between the two groups. **Conclusion:** The results of this study showed that traumatized veterans and refugees present different symptom clusters of PTSD and differences in comorbid depressive and somatic symptoms. These results imply that these groups might need other treatment approaches in order to achieve better treatment outcomes. Recommendations for future research are examining the effect of different treatment approaches in these groups and the use of other analytic techniques to replicate current findings.

## Master thesis

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## 1. Introduction

Post-traumatic stress disorder (PTSD) is a psychiatric disorder that can occur when people have experienced or witnessed a traumatic event such as a serious accident, abuse, combat, a natural disaster, or violent crime (American Psychiatric Association [APA], 2013; Dahlgren et al., 2017). The Fifth edition of the Diagnostic and Statistical Manual of Mental Disorders

(DSM-5), describes the following clusters of symptoms for PTSD: intrusion symptoms associated with the traumatic event (e.g. flashbacks and distressing dreams and memories); avoidance of trauma-related stimuli; negative thoughts or feelings beginning or worsening after the traumatic event; and alterations in arousal and reactivity associated with, and beginning or worsening after the traumatic event (e.g. hypervigilance and concentration

problems) (APA, 2013; Roberts, Roberts, Jones, & Bisson, 2016).

Several populations are identified as high-risk groups for the development of PTSD. Two well-studied populations are refugees and veterans (Olf, 2002). Refugees are exposed to a high number of potentially traumatic events in their countries of origin and during their flight. Besides, in country of arrival they can be exposed to stressors such as involvement in complex asylum-seeking procedures and resettlement in an unfamiliar environment. These potentially traumatic events and stressors make them vulnerable for developing a psychiatric disorder like PTSD (Knipscheer, Sleijpen, Mooren, Ter Heide, & Van der Aa, 2015; Fazel, Wheeler, & Danesh, 2005). Veterans are at an increased risk for developing PTSD because of exposure to potentially traumatic events and stressors during a mission such as combat and atrocities (Yehuda, Southwick, & Giller, 1992; Smith et al., 2008).

### *1.1 Conceptualization of PTSD*

Although refugees and veterans are both considered to be at higher risk to develop PTSD, it is unclear whether the conceptualization of PTSD is similar in both groups. Several studies find different factor structures of PTSD in these groups (APA, 2013; Armour et al., 2015; Wind, Van der Aa, De la Rie, & Knipscheer, 2017). As mentioned above, the DSM-5 uses four clusters of PTSD symptoms (re-experiencing, avoidance, negative thoughts or feelings, and alterations in arousal and reactivity) (APA, 2013). Armour et al. (2015) compared five different models using confirmatory factor analysis in veterans. Their results showed that the four-factor DSM-5 model did fit the data adequately, but not optimally. A six-factor model (re-experiencing, avoidance, negative alterations in cognitions and mood, anhedonia, dysphoric arousal, and anxious arousal) provided better fit than the DSM-5 model. Furthermore, they suggested a new seven-factor model. This newly proposed

model (re-experiencing, avoidance, negative affect, anhedonia, externalizing behaviors, anxious arousal, and dysphoric arousal) provided superior fit to the data (Armour et al., 2015). Wind et al. (2017) applied exploratory factor analysis (EFA) to examine the factor structure of PTSD symptoms among refugees in The Netherlands, using the Harvard Trauma Questionnaire (HTQ). Their EFA yielded a three-factor structure consisting of symptoms of intrusion, hypervigilance, and avoidance.

These possible differences in the conceptualization of the latent variable PTSD might affect treatment outcomes. If refugees and veterans show different underlying structures of their PTSD symptoms, e.g. if among refugees re-experiencing symptoms are a bigger underlying factor for their PTSD and if among veterans, avoidance is a more prominent factor for their PTSD this might indicate that the focus of treatment should also be different. Nowadays the recommended treatment for PTSD, according to the National Institute for Health and Care Excellence (NICE, 2017), is similar for all PTSD patients. The APA-guidelines for PTSD treatment do also not distinguish recommended treatments for different PTSD populations (APA, 2017).

In addition, differences in conceptualizations of PTSD might indicate that these groups cannot be compared regarding to their symptoms. For instance, comparing symptom severity or comparing symptoms for other research purposes using a questionnaire for PTSD, might not be possible because the outcome (the latent variable PTSD) consists of other elements in these groups (Mansfield, Williams, Hourani, & Babeu, 2010).

### *1.2 Comorbid symptoms*

Besides the possible differences in conceptualization of PTSD between veterans and refugees, there may be differences in comorbid symptoms. Several studies found that both groups frequently show comorbid symptoms (Richardson

et al., 2017; Berthold et al., 2014; Fazel et al., 2005).

PTSD and comorbid depression has been frequently studied among different populations (Ginzburg, Ein-Dor, & Solomon, 2010; Momartin, Silove, Manicavasager, & Steel, 2004). A systematic review from Fazel et al. (2005) showed prevalence rates of PTSD and comorbid depression ranging from 2% to 18% among refugees. Among Korean War veterans, Ikin, Creamer, Sim and McKenzie (2010) found that 17% met criteria for PTSD and comorbid depression. This presents that PTSD with comorbid depressive symptoms occurs in veterans as well as in refugees.

Other frequent comorbid symptoms of PTSD are symptoms of somatization (Spitzer et al., 2009). Somatization can be defined as the tendency to attribute psychological or social distress to physical illness and to seek medical help for this (Rohlof, Knipscheer, & Kleber, 2014; Vonnahme, Lankau, Ao, Shetty, & Cardozo, 2015). Aragona et al. (2010) found a relation between somatization and posttraumatic events and posttraumatic symptoms among immigrants. Posttraumatic symptoms were more frequent among somatizers than in non-somatizers. Furthermore, posttraumatic symptoms significantly influenced the tendency to somatize. Several studies demonstrated that the rate of comorbid somatic symptoms was particularly high among refugees (Morina et al., 2017; Teodorescu et al., 2015; Dahl et al., 2006). Cultural opinions regarding psychiatric care and the fear of stigmatization can serve as explanations for these high rates of somatization among refugees. Because of the fear that they will be considered mad by their compatriots, they prefer to be referred to medical services rather than to psychiatric care. This fear of stigmatization, as a result of cultural opinions, influences the expression of symptoms (Rohlof et al., 2014). These somatic complaints often cause diagnostic and therapeutic problems in primary care

settings in this population (Catino et al., 2009; Morina et al., 2017).

Symptoms of hostility are frequently found among traumatized veterans. A meta-analysis from Orth and Wieland (2006) showed a strong relationship between PTSD and anger, and PTSD and hostility. Veterans with PTSD exhibited higher levels of anger and hostility compared to veterans without PTSD (Castillo, Fallon, Baca, Conforti, & Qualls, 2001; Jakupcak et al., 2007; Murphy, Ashwick, Palmer, & Busuttil, 2017). Thus, PTSD and comorbid symptoms of hostility are particularly found in studies among veterans.

Comorbidity is clinically important in relation to PTSD symptoms (Blair, 2000). Refugees with comorbid symptoms showed a three to five times greater severity of overall symptoms than those with PTSD alone (Karam, 1997; Blair, 2000). In addition, comorbidity in PTSD often leads to poorer treatment outcomes (Foa, Keane, Friedman, & Cohen, 2008; Tural, Önder, & Aker, 2012; Haagen, Ter Heide, Mooren, Knipscheer, & Kleber, 2017). This shows the importance of identifying the specific comorbid symptoms that are present, in order to include and address these symptoms in treatment and therefore improve treatment outcomes.

### *1.3 Present study*

The first part of this study examines whether there is a difference in the conceptualization of PTSD among treatment-seeking veterans and refugees. To the author's knowledge, it is the first time that conceptualizations of PTSD among refugees and veterans are being compared. Therefore, there are no specific expectations. Nevertheless, previous factor analytic studies showed different factor structures in different PTSD populations which indicates possible differences between these groups.

In the second part of the study, comorbid symptoms of depression, somatization and hostility will be compared among refugees and veterans. Comorbid symptoms of depression seem

to occur in refugees as well as in veterans (Fazel, 2005; Ikin et al., 2010). Therefore, there is no difference expected between these groups regarding depressive symptoms. Since somatic symptoms are particularly found among refugees, these symptoms are expected to be higher among refugees than among veterans (Escalona, Achilles, Waitzkin, & Yager, 2004). Symptoms of hostility are expected to be higher among veterans than among refugees (Castillo et al., 2001; Jakupcak et al., 2007; Murphy et al., 2017). Again, this is explorative since there are no previous studies that compared differences in these comorbid symptoms between these specific populations.

## 2. Method

### 2.1 Procedure and participants

Data were collected at Foundation Centrum '45, a specialized Dutch center for treatment and diagnosis of complex psychotrauma. Foundation Centrum '45 routinely monitors treatment outcomes by administering questionnaires to patients during their treatment. In the present study, the collected intake data from this Routine Outcome Monitoring (ROM) was used. The data were collected between October 2014 and October 2017. During the intake, patients were informed and gave permission that their data could be used for research. Patients who did not give the permission were removed from the database.

Participants were included for the first part of the study when they (a) belonged to the target populations 'veterans' or 'refugees' (refugees, asylum seekers, and undocumented migrants) and (b) met the criteria for a PTSD diagnosis according to the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5). The additional inclusion criteria for the second part of the study was that (c) participants completed the Brief Symptom Inventory (BSI). This resulted in 365 participants (94 veterans and 271 refugees) for

the first part of the study and 309 participants (81 veterans and 228 refugees) for the second part of the study. Table 1 presents the demographic characteristics of the target groups for each part of the study.

### 2.2 Measures

#### 2.2.1 Clinician-Administered PTSD Scale for DSM-5

The CAPS-5 is a clinician administered interview for the assessment of PTSD based on the DSM-5 criteria (Weathers et al., 2013; Boeschoten et al., 2014). It consists of 20 diagnostic criteria measuring PTSD symptoms and 10 items measuring duration of symptoms, distress or impairment, global ratings, and the dissociative subtype. The diagnostic criteria are rated by clinicians on a 5-point scale ranging from 0 = *absent* to 4 = *extreme/incapacitating*, using information on both the frequency and the intensity of symptoms. A symptom is considered endorsed and counted toward diagnosis when the severity score of a symptom is 2 (*moderate or threshold*) or higher.

The CAPS-5 provides a continuous measure of the severity of overall PTSD and of the four symptom clusters: intrusions, avoidance, negative alterations in cognition/mood, arousal and reactivity. Furthermore, it provides a measure of presence/absence of PTSD diagnosis including the dissociative subtype. The total symptom severity score, ranging from 0 to 80, is the sum of the severity scores for the 20 DSM-5 PTSD symptoms. The criteria for a PTSD diagnosis are met when an individual has at least one Criterion B (re-experiencing) and one Criterion C (avoidance) symptom; at least two Criterion D (negative cognitions and mood) and two Criterion E (reactivity and arousal) symptoms. Additionally, the duration has to be longer than one month (Criterion F) and the symptoms cause functional impairment or clinically significant distress (Criterion G). CAPS-5 diagnosis has demonstrated strong interrater reliability and test-retest reliability. Besides the total

severity score demonstrated high internal consistency (Weathers et al., 2017). The present study found a sufficient internal consistency of the CAPS-5 ( $\alpha = .76$ ).

### 2.2.2 Brief Symptom Inventory

The BSI (Derogatis & Melisaratos, 1983; De Beurs, 2011) is a self-report checklist consisting of 53 items. It contains nine psychological symptom domains: Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Paranoid Ideation, Phobic Anxiety, and Psychoticism. Respondents were asked to rate on a 5-point scale (ranging from 0 = *not at all* to 4 = *extremely*) to what extent they suffered from each symptom described in the item during the past seven days. Scoring of the BSI yields nine individual subscale-scores and three global indices of distress: the Global Severity Index (GSI; average response on each item), the Positive Symptom Total (PST; the number of items with responses > 0), and the Positive Symptom Distress Index (PSDI; sum of item scores divided by PST). These global indices measure current or past level of symptomatology, the number of reported symptoms, and the intensity of reported symptoms respectively. GSI scores of 63 or above, or cases in which two of the dimension scores are 63 or above are considered clinical (Derogatis, 1993; Zabora, Smith-Wilson, Fetting, & Enterline, 1990). Regarding to the subscales, the following cut off scores are used for male outpatients: a mean score of 0.71 for depression, a mean score of 0.47 for somatization, and a mean score of 0.54 for the subscale hostility (De Beurs, 2006). The BSI has demonstrated good psychometric properties (Derogatis & Melisaratos, 1983; De Beurs & Zitman, 2005). Besides, the individual subscales depression, somatization and hostility have been found to be sufficiently reliable (Broday & Mason, 1991; De Beurs & Zitman, 2005). Internal consistency of the BSI in the present study was excellent ( $\alpha = .95$ ).

### 2.3 Statistical analyses

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS), version 23. First, means and standard deviations (SD) were used to summarize the demographic data in both veterans and refugees. Independent *t* tests were used to analyze the differences in descriptive demographic (gender and age) and clinical (symptom severity score on the CAPS-5) characteristics between the target groups. Results were considered statistically significant if the *p*-value was < 0.05.

In order to examine how PTSD was conceptualized in veterans and in refugees, principal component analyses (PCA) were used in both groups. Oblimin rotation was chosen because it was expected that the underlying factors were related (Field, 2013). The variables of the PCA consisted of the items from the CAPS-5. Kaiser's criterion (i.e. eigenvalues of the factors need to be greater than 1.0) was used to extract different factors. The preliminary analyses in both groups showed acceptable Pearson correlations and assumed that each item had an underlying normal distribution. For the veteran sample, the Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis,  $KMO = .67$  ('mediocre' according to Field, 2013). Barlett's test of sphericity indicated that correlations between items were sufficient ( $\chi^2(190) = 419.83, p < .001$ ). The refugee sample was also adequate for the analysis according to the KMO measure,  $KMO = .80$  ('superb' according to Field, 2013). Barlett's test of sphericity indicated that correlations between items were sufficient for PCA ( $\chi^2(190) = 798.84, p < .001$ ). Overall, this indicated that the assumptions for the PCA were met in both groups.

Furthermore, the differences in comorbid symptoms among veterans and refugees were studied. A multivariate analysis of variance (MANOVA) was conducted in order to determine the effect of target group (veteran/refugee) on (1) depressive mood, (2) somatic symptoms, and (3) hostility. Pillai's trace was used given

the relatively large sample size and the fact that the assumptions of homogeneity of covariance, using Box's test, and multivariate normality were met (Field, 2013). If there was a significant difference at  $\alpha < .05$ , the analysis was followed up by separate analyses of variance (ANOVAs) on each of the dependent variables. The error variances of the dependent variables were equal, so the assumption for these ANOVAs was met (Allen & Bennett, 2012). For the ANOVAs, a Bonferroni adjusted alpha level of .017 was used.

### 3. Results

#### 3.1 Demographic characteristics

Table 1 shows the number of men, the mean age, and the PTSD symptom severity score for

veterans and refugees for each part of the study. The difference in the number of men was significant for both parts of the study. For the first part, PTSD conceptualization, the veteran sample consisted of a significantly larger proportion of men compared to refugees  $t(361.75) = -8.316, p < .001$ . In addition, for the second part, comorbid symptoms, the sample of veterans consisted of a significantly larger proportion of men compared to the refugee sample  $t(306.97) = -7.218, p < .001$ . Regarding to symptom severity, for the first part of the study the difference in symptom severity score on the CAPS-5 between the two groups was significant  $t(168.30) = -2.357, p = .019$ . Refugees reported a significantly higher severity of PTSD symptoms than veterans.

Table 1

*Demographic characteristics per and target group and part of the study*

	Veterans	Refugees	Total
<u>Part 1: Conceptualization of PTSD</u>			
<i>N</i>	94	271	365
Male, <i>n</i> (%) *	92 (98)	195 (72)	287 (79)
Age, mean (SD)	43.0 (10.2)	41.2 (11.1)	41.7 (10.9)
Symptom severity score CAPS-5, mean (SD) *	39.2 (8.7)	41.8 (9.1)	41.1 (9.1)
<u>Part 2: Comorbid symptoms</u>			
<i>N</i>	81	228	309
Male, <i>n</i> (%) *	79 (98)	166 (73)	245 (79)
Age, mean (SD)	43.1 (9.5)	41.6 (10.9)	42.0 (10.6)
Symptom severity score CAPS-5, mean (SD)	39.5 (8.8)	41.6 (10.9)	40.9 (8.8)

Note. \*  $p < .05$ , *t*-test between target groups. CAPS-5 = Clinician-Administered PTSD Scale for DSM-5.

#### 3.2 Conceptualization of PTSD

##### 3.2.1 Veterans

The initial PCA analysis in veterans distinguished six components with an eigenvalue greater than 1. Every item contributed to one of the six components. In the final analysis six

components were retained, given Kaiser's criterion and the scree plot. In combination, these six components explained 57.8% of the variance. Table 2 presents the factor loadings after rotation. The items that cluster on the same components suggest that component one represents

avoidance, anhedonia and hypervigilance (20% of the total variation), the second component negative affect (10% of the total variation), the third sleep problems (8% of the total variation), the fourth intrusions (7% of the total variation), the fifth irritability (7% of the total variation), and the sixth component psychological reactivity (6% of the total variation).

### *3.2.2 Refugees*

The initial PCA analysis in refugees showed seven components with eigenvalues greater than 1. Three items (B3-Dissociative reactions, D4-Persistent negative emotional state, and E4-exaggerated startle response) did not contribute substantively to any of the seven extracted components, so the analysis was rerun without these items (Field, 2013; Stevens, 2002). Seven factors were retained with eigenvalues greater than 1, which together accounted for 60.7% of the total variance. Table 3 shows the factor loadings after rotation. The symptoms that cluster on the same component suggest that the first component represents anhedonia (20% of the total variation), the second sleep and concentration problems (9 % of the total variation), the third externalizing behavior (7% of the total variation), the fourth avoidance of thoughts (7% of the total variation), the fifth intrusions (6% of the total variation), the sixth negative alterations in cognitions and mood (6% of the total variation), and the seventh component hypervigilance and avoidance of reminders (6% of the total variation).

Table 2

*Summary of principal component analysis for PTSD symptoms in veterans (n = 94)*

	Rotated factor loadings					
	Avoidance, anhedonia and hypervigilance	Negative affect	Sleep problems	Intrusions	Irritability	Psychological reactivity
B1 - Recurrent, involuntary, and intrusive distressing memories of the traumatic event.	.13	-.11	.08	<b>.69</b>	.01	.19
B2 – Recurrent distressing dreams in which the content and/or affect of the dream are related to the event(s).	-.07	-.01	<b>.85</b>	.17	.16	.07
B3 – Dissociative reactions (e.g. flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring.	-.16	.07	.00	<b>.78</b>	-.00	-.31
B4 – Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).	-.12	-.07	.12	.04	.06	<b>.86</b>
B5 – Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).	.12	.01	-.02	<b>.56</b>	-.05	.20
C1 – Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event.	<b>.47</b>	-.25	.11	.05	.03	.06
C2 – Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).	<b>.56</b>	.02	.27	-.00	-.20	.05
D1 – Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).	-.38	<b>.69</b>	.06	-.10	.05	.08



D2 – Persistent and exaggerated negative beliefs or expectations about oneself, others or the world.	.30	<b>.52</b>	-.02	.05	<b>-.58</b>	-.02
D3 – Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.	.05	<b>.55</b>	.29	.05	.16	-.06
D4 - Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).	<b>.52</b>	-.05	-.01	.00	.12	<b>.42</b>
D5 – Markedly diminished interest or participation in significant activities.	<b>.55</b>	.02	-.11	.02	.04	.40
D6 – Feelings of detachment or estrangement from others.	<b>.63</b>	.23	-.17	.21	-.01	.09
D7 – Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).	<b>.69</b>	.05	-.11	.18	.09	-.08
E1 – Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.	.16	.24	-.25	-.15	<b>.70</b>	.15
E2 – Reckless or self-destructive behavior.	.10	<b>.65</b>	-.10	.05	.15	-.09
E3 – Hypervigilance.	<b>.77</b>	.01	.27	-.12	.03	-.22
E4 – Exaggerated startle response.	.09	.17	.22	.12	<b>.61</b>	-.08
E5 – Problems with concentration.	.04	<b>.46</b>	-.01	.05	-.20	<b>.46</b>
E6 – Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).	.19	.09	<b>.75</b>	-.13	-.17	.07

*Note.* Factor loadings over .40 appear in bold.

Table 3

*Summary of principal component analysis for PTSD symptoms in refugees (n = 271)*

	Rotated factor loadings						
	Anhedonia	Sleep- and concentration problems	Externalizing behavior	Avoidance of thoughts	Intrusions	Negative alterations cognitions and mood	Hypervigilance and avoidance of reminders
B1 – Recurrent, involuntary, and intrusive distressing memories of the traumatic event.	.16	-.32	-.26	-.38	<b>.44</b>	-.06	-.16
B2 – Recurrent distressing dreams in which the content and/or affect of the dream are related to the event(s).	-.12	<b>-.64</b>	.11	-.14	.25	.05	-.09
B4 – Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).	.02	.02	.15	.05	<b>.69</b>	-.13	.28
B5 – Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).	.03	-.05	-.06	.03	<b>.75</b>	.13	-.03
C1 – Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event.	.07	-.01	.03	<b>-.84</b>	-.04	.09	-.07
C2 – Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).	-.01	-.10	-.12	.18	.09	.02	<b>.79</b>
D1 – Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).	.16	.12	-.16	-.02	.06	<b>.62</b>	-.00

D2 – Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world.	<b>.60</b>	.20	.03	-.12	.10	.07	.26
D3 – Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.	-.31	-.05	.27	-.16	-.03	<b>.72</b>	.11
D5 – Markedly diminished interest or participation in significant activities.	.30	-.26	-.13	.23	-.04	<b>.47</b>	.02
D6 – Feelings of detachment or estrangement from others.	<b>.69</b>	-.05	.17	.07	.09	.14	-.09
D7 – Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).	<b>.76</b>	-.13	.06	-.09	-.03	-.14	.02
E1 – Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.	.20	-.06	<b>.66</b>	.27	.14	.17	-.25
E2 – Reckless or self-destructive behavior.	.09	-.04	<b>.76</b>	-.20	.06	-.13	.10
E3 – Hypervigilance.	.16	-.05	.16	-.22	.09	.16	<b>.55</b>
E5 – Problems with concentration.	.26	<b>-.59</b>	-.02	-.05	-.25	.01	.20
E6 – Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).	-.04	<b>-.79</b>	.01	.09	.04	-.06	.07

*Note.* Factor loadings over .40 appear in bold.

### 3.3 Comorbid symptoms

Secondly, a MANOVA was performed to compare comorbid symptoms. Using Pillai's trace, there was a significant effect of the target group (veterans/refugees) on the dependent variables depressive mood, somatic symptoms and hostility,  $V = 0.18$ ,  $F(3, 305) = 21.55$ ,  $p < .001$ , partial  $\eta^2 = .175$ . This indicated a difference in comorbid symptoms between veterans and refugees.

The univariate analysis of the dependent variables individually showed a significant difference between the groups regarding to depressive mood,  $F(1, 307) = 24.60$ ,  $p < .001$ , partial  $\eta^2 = .074$ . Refugees reported significantly more symptoms of depression ( $M = 2.64$ ) than veterans ( $M = 2.08$ ). There was also a significant difference in somatic symptoms between the groups,  $F(1, 307) = 33.90$ ,  $p < .001$ , partial  $\eta^2 = .099$ . Refugees scored significantly higher on somatic symptoms ( $M = 2.04$ ) than veterans ( $M = 1.38$ ). No significant difference was found regarding to symptoms of hostility between veterans ( $M = 1.90$ ) and refugees ( $M = 1.67$ ),  $F(1, 307) = 3.18$ ,  $p = .076$ .

## 4. Discussion

To gain more knowledge about the differences in conceptualization of PTSD in different high-risk populations, this study identified and compared the conceptualizations of PTSD among treatment-seeking veterans and refugees. A second aim of the study was to compare comorbid hostility, depressive and somatic symptoms of PTSD in these groups.

### 4.1 Conceptualization of PTSD

The first part of the study found six underlying components of PTSD symptoms among veterans: (1) avoidance, anhedonia and hypervigilance, (2) negative affect, (3) sleep problems, (4) intrusions, (5) irritability, and (6) psychological reactivity. Analysis of underlying

components in the refugee sample presented seven components: (1) anhedonia, (2) sleep- and concentration problems, (3) externalizing behavior, (4) avoidance of thoughts, (5) intrusions, (6) negative alterations in cognitions and mood, and (7) hypervigilance and avoidance of reminders.

Comparing these two conceptualizations, it appeared that in both groups anhedonia explained the largest part of the total variation (both 20%). This indicates that in veterans as well as in refugees, anhedonia is an important component of the latent variable PTSD. These findings support previous research which claimed that anhedonia is an independent, separate factor within PTSD (as it is defined in the DSM-5), which is in contrast to the DSM-5 model that does not include an anhedonia factor (Liu et al., 2014; Armour et al., 2015). These findings also suggest overlap between PTSD symptoms and depressive symptoms (Biehn et al., 2013), and might play a role in the high rates of PTSD with comorbid depression (Fazel et al., 2005; Ikin et al., 2010). Furthermore, results of the present study are in line with previous studies that claim that six-factor and seven-factor models (Liu et al., 2014; Armour et al., 2015) provide superior fit compared to the DSM-5 four-factor model (APA, 2013) regarding PTSD symptom structure. The analysis of refugees in present study yielded seven components, in contrast to previous research that found a three-factor symptom structure among refugees (Wind et al., 2017). A possible explanation could be the fact that the latter study used a different (self-report) instrument to measure PTSD symptoms (HTQ) which might explain that they found another structure based on the reported PTSD symptoms.

Veterans and refugees showed differences in PTSD symptom structure when comparing the underlying components. Avoidance and hypervigilance explained 20% of the total variation in the veterans group, but only 6% in

refugees. Suggesting that avoidance and hypervigilance seemed to be a more important PTSD component in veterans than in refugees. This implicates that these groups might require a different approach in treatment. Veterans might need more help to break through avoidance, and to deal with hypervigilance in contrast to refugees. In addition, the fact that veterans and refugees show other components and analysis of symptoms in refugees even yielded one component more, indicates that the latent variable PTSD consists of other elements in both groups. These results indicate that the two groups are not comparable when it comes to their PTSD symptoms (Mansfield et al., 2010). This has its consequences for clinical practice and research, e.g. comparing to norm groups and comparisons of PTSD symptom severity.

It should be mentioned that in the veteran sample, this study found a slightly same component structure compared to previous research but that the distribution of items over the components still showed differences (Liu et al., 2014; Armour et al., 2015). This finding, and the fact that several other factor analytic studies find various models explaining PTSD symptoms, raises questions about the stability of the analysis (APA, 2013; Armour et al., 2015; Wind, Van der Aa, De la Rie and Knipscheer, 2017).

Another remarkable fact was that the items dissociative reactions, persistent negative emotional state, and exaggerated startle response did not seem to be relevant for one of the PTSD symptom components among refugees in this study. Therefore, these items needed to be deleted from the analysis. However, previous research found that a strong general negative emotional state and exaggerated startle responses were highly central symptoms of PTSD among refugees (Spiller et al., 2017). Future research should further investigate the role of these symptoms in PTSD among refugee samples.

#### *4.2 Comorbid symptoms*

The second part of the study compared symptoms of depression, somatization and hostility among refugees and veterans. These three comorbid symptoms combined showed a significant difference between the two groups. Refugees reported more comorbid depressive symptoms than veterans. Previous research found that comorbid depressive symptoms occurred in veterans as well as in refugees (Fazel, 2005; Ikin et al., 2010). Current finding indicates that refugees need more attention to depressive symptoms during a PTSD treatment compared to veterans.

Furthermore, refugees showed more comorbid somatic symptoms than veterans. This is in line with previous research showing that comorbid somatic symptoms are particularly high among refugees (Morina et al., 2017; Teodorescu et al., 2015; Dahl et al., 2006). Cultural opinions regarding psychiatric care and the fear of stigmatization are frequently used explanations for this high prevalence rate of somatic symptoms in refugees compared to other populations (Rohlof et al., 2014). Therefore, these findings imply that compared to veterans, treatment for refugees has to be more focused on somatization and somatic fixation. Treatment could for instance combine physical activity with cognitive behavioral therapy, in order to receive better treatment outcomes in refugees (Rohlof et al., 2014).

Besides, the present study did not find a difference in comorbid hostility symptoms between veterans and refugees. Veterans and refugees both reported a high level of comorbid hostility symptoms (De Beurs, 2006). This indicates that these symptoms are present among both groups, notwithstanding that previous research mainly focused on hostility symptoms among veterans (Castillo et al., 2001; Jakupcak et al., 2007; Murphy et al., 2017). Future research should also investigate these comorbid hostility symptoms among traumatized refugees.

### *4.3 Strengths and limitations*

The present study was the first that investigated differences in the conceptualization of PTSD between treatment seeking refugees and veterans. Furthermore, no previous studies examined differences in PTSD and comorbid depressive symptoms, somatic symptoms, and hostility among refugees and veterans. Therefore, this study provides an important contribution to the knowledge of symptom structures of PTSD and differences in comorbid symptoms among different target populations.

Despite these strengths, current study also has its limitations. Differences in demographic characteristics might have caused unreliable outcomes. The refugee sample consisted of significantly more women and reported more severe PTSD symptoms than veterans. Previous research found indications that men's post-traumatic reactions are different from those of women (Gibbs, 1989; King, Street, Gradus, Vogt, & Resick, 2013; Hourani, Williams, Bray, Kandel, 2015). King et al. (2013) found small but significant gender differences. Men tended to report more frequent nightmares, hypervigilance and emotional numbing, while women tended to report more concentration problems and distress from reminders. These gender differences could have influenced the differences in symptom clusters and comorbid symptoms that were found in present study. I.e. the differences that were found in the present study might be due to these gender differences.

Another limitation is the nature of the analysis that is used in the first part of the study. Even though PCA is a popular method for data reduction, methodologist argue that a factor analysis would be a better method for data reduction and analyzing an underlying structure (Gorsuch, 2003; De Winter & Dodou, 2016). Furthermore, previously mentioned studies regarding factor structures were based on factor analysis instead of PCA, which makes it difficult to compare the results (APA, 2013; Armour et al., 2015; Wind et al., 2017).

In addition, due to the relatively small sample sizes, the power and robustness of current analyses are quite low, so the results should be interpreted with care.

Finally, the present study used data from patients of Foundation Centrum '45, which is a specialized institution. These patients often have severe PTSD and/or already received treatment in other institutions. In addition, ROM assessments were completed by about 55% of all patients of Foundation Centrum '45. Therefore, results of the present study may not generalize to the population, since the veteran and refugee samples might not be representative for all veterans and refugees with a PTSD diagnosis.

### *4.4 Future research*

Despite above-mentioned limitations, the present study provides starting points for future research. Given the doubts about the accuracy of a PCA, future research could conduct a factor analysis in refugees and veterans to support current findings. Moreover, to further investigate the possible differences in meaning of the outcome of questionnaires, measurement invariance studies should be conducted. If it turns out that the items of the questionnaire as well as the concept they are measuring are interpreted differently by different target populations, then this could be an indication that they might need different instruments of diagnosing PTSD. In addition, only if measurement invariance holds, cross-group differences in scores on the constructs are meaningful (Van de Schoot, Lugtig, & Hox, 2012).

Another suggestion for future research is to compare symptom structures of PTSD in other populations that are in higher risk to develop PTSD. For example, victims of sexual violence, traffic victims, police officers, and post-war generations. If it turns out that these populations also differ in PTSD conceptualization, then it should be investigated which treatment approaches should be offered in which

group, in order to find an approach that best fits the PTSD complaints. For this purpose, the effectiveness of various treatment approaches based on the PTSD conceptualization in the different populations should be studied.

#### 4.5 Conclusion

The present study was the first that compared conceptualizations of PTSD in two different high-risk populations: veterans and refugees. The results of this study showed that veterans

and refugees present different symptom clusters of PTSD and differences in comorbid depressive and somatic symptoms. These findings indicate that veterans and refugees might need a different focus in treatment, resulting in improved treatment outcomes. Future research with other analytic techniques is recommended to replicate these findings and further investigate the effectiveness of various treatment approaches based on PTSD conceptualizations.

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