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Complex PTSD in asylum-seekers living in a humanitarian setting in Africa: a latent class analysis

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Author note

We have no conflict of interest to disclose. The data that support the findings of this study are available on request from the corresponding author, [A.B.]

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Abstract

Objective: This study investigated ICD-11 posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD) symptom profiles and their premigration, postmigration, and demographic predictors in a treatment-seeking sample of asylum-seekers in Agadez (Niger).

Method: Participants were 126 asylum-seekers hosted *in a large, isolated reception camp in the desert surroundings of Agadez (Humanitarian Site)* or in a number of small urban hosting facilities (*Cases de Passages*) who completed measures of trauma exposure and PTSD/CPTSD symptoms. Latent Class Analysis (LCA) was used to identify symptom profiles, and predictors of class membership were identified via multinomial logistic regression.

Results: More asylum seekers met the criteria for CPTSD (74.6%) than PTSD (19.8%) and no gender differences were observed. LCA results identified two distinct groups: (a) a CPTSD class (69.0%); (b) a PTSD class (31.0%). Membership in the CPTSD class was significantly predicted by the early age of the first traumatic event, levels of functional impairment and reception conditions. Specifically, *those in the CPTSD class were more likely to live in the Humanitarian Site compared to those in the PTSD class.*

Conclusion: This study supported the validity of the ICD-11 construct of CPTSD in an asylum-seeker sample living in a low-income country. Moreover, the findings suggest that not only premigration factors (i.e., the early age of the first trauma) but also postmigration stressors (i.e., inadequate reception conditions in large, isolated facilities) are important predictors of CPTSD symptoms with important implications regarding reception policies and the prevention of trauma-related mental disorders in asylum seekers and refugees.

Key words: asylum-seekers; posttraumatic stress; complex posttraumatic stress; postmigration stressors; ICD-11.

Clinical Impact Statement

This study, conducted *in a large reception camp located in a desert area* and in a number of small urban hosting facilities in Niger, first supported the validity of the construct of complex posttraumatic stress disorder (CPTSD) in an asylum-seeker sample living in a low-income country. Moreover, the findings suggest that not only premigration factors (i.e., the early age of the first trauma) but also postmigration stressors (i.e., inadequate reception conditions in large, isolated facilities) are important predictors of CPTSD symptoms with important implications regarding reception policies and the prevention of trauma-related mental disorders in asylum seekers and refugees.

The 11th version of the International Classification of Diseases (ICD-11; World Health Organization [WHO], 2019), has recently introduced the "sibling" diagnosis of posttraumatic stress disorder (PTSD) and the newly added complex PTSD (CPTSD) (Maercker et al., 2013). This was a turning point in the field of traumatic stress studies as it follows a long controversy concerning the nosological status and composition of the proposed construct of CPTSD (Bryant, 2012; Cloitre, 2016; Herman, 2012; Resick et al., 2012;) in which its validity as a clinical syndrome has been questioned primarily owing to overlapping symptomology with other trauma-related disorders (Wolf et al., 2015). The ICD-11 characterizes PTSD by three clusters of symptoms: re-experiencing of trauma in the present, avoidance of trauma-related stimuli, and sense of current threat. ICD-11 criteria for CPTSD comprise the same PTSD symptoms and three additional symptom clusters that reflect disturbances in self-organization (DSO): affective dysregulation, negative self-concept and disturbances in relationships. For both disorders, diagnosis follows if symptoms persist for several weeks and result in significant functional impairment. However, PTSD symptoms may lead to PTSD diagnosis only in the absence of DSO, whereas CPTSD requires endorsement of both PTSD and DSO symptoms. This hierarchical structure ensures that PTSD and CPTSD never co-occur.

There is now a significant body of literature that supports the hierarchical structure presented in the ICD-11. This includes a notable systematic review (Brewin et al., 2017) and a variety of validation studies: latent class analyses (Barbieri et al., 2019; Ho et al., 2020; Hyland et al., 2018; Jowett, Karatzias, Shevlin, & Albert, 2019; Karatzias et al., 2017; Rink & Lipinska, 2020), confirmatory factor analyses (Hyland et al., 2017; Karatzias et al., 2016; Kazlauskas, Gegieckaite, Hyland, Zelviene, & Cloitre, 2018; Murphy et al., 2020; Owczarek et al., 2020), and network analyses (Gilbar, 2020; Knefel et al., 2019, 2020; Knefel, Tran, & Lueger-Schuster, 2016; McElroy et al., 2019).

Whereas PTSD may follow a circumscribed traumatic event, risk factors for CPTSD include exposure to repeated, prolonged, interpersonal traumatic events (complex traumatic events; CTEs) from which escape is difficult or impossible, such as torture, genocide campaigns, prolonged domestic violence, repeated childhood sexual or physical abuse (Hyland et al., 2017b; World Health Organization, 2019). In accordance, there is growing evidence from research in western settings supporting the validity of this disorder with individuals exposed to sustained interpersonal trauma (Perkonigg et al., 2016), institutional abuse (Knefel et al., 2015), childhood abuse (Cloitre, Garvert, Weiss, Carlson & Bryant, 2014), and people seeking treatment following exposure to a range of trauma types (Cloitre et al., 2013).

While CPTSD was originally formulated to describe distinctive psychological responses arising from events where an individual is under the sustained and coercive control of a perpetrator (i.e. torture) (Herman, 1992), there has been scarce examination of CPTSD in individuals from non-western countries who have been exposed to displacement, torture and other gross violations of human rights such as asylum seekers and refugees. It has been suggested that CPTSD may be particularly relevant to these groups given the high frequency of CTEs to which they are usually exposed (de Jong, Komproe, Spinazzola, van der Kolk, & van Ommeren, 2005; Palic & Elklit, 2014). In addition, asylum seekers and refugees are displaced to unfamiliar postmigration environments, and may be unable to access important sources of support or established strategies for managing distress (e.g. family and friendship networks, work, leisure activities). These experiences may have an especially strong impact on the CPTSD domains of affect regulation, interpersonal relations and self-concept. Indeed, the available data strongly suggest that the postmigration environment plays a critical role in either fostering or impeding recovery from trauma related disorders in refugees and asylum seekers (Li, Liddell & Nickerson, 2016; Miller & Rasmussen, 2017). Today it is particularly

important to investigate the construct of CPTSD in refugee groups considering the growing number of persons forcibly displaced worldwide (today globally estimated in 79.8 million people; UNHCR, 2020) and the potential relevant reduction in the global burden of suffering through adequate prevention and treatment of CPTSD symptoms amongst these populations.

To date, only a few investigations evaluated the discriminant validity of ICD-11 PTSD and CPTSD amongst asylum seekers and refugees (Barbieri et al., 2019; Frost et al., 2019; Hyland et al., 2018; Liddel et al., 2019; Vang, Nielsen, Auning-Hansen & Eklit, 2019) and none in low-income countries where a substantial number of asylum seekers, refugees and other forcibly displaced people worldwide are hosted (UNHCR, 2020). All studies supported for two distinct trauma-based disorders, as put forward in the ICD-11. Moreover, despite the growing empirical support for the ICD-11 proposed qualitative distinctions between PTSD and CPTSD, there remains insufficient evidence regarding the factors that may serve to distinguish these two different clinical responses to trauma (Hyland et al., 2017b). With regard to refugee populations, it is indeed important to acquire a more thorough understanding of the premigration and postmigration factors that can differentially predict a CPTSD response from a PTSD response.

In the current study we sought to evaluate the discriminant validity of ICD-11 PTSD and CPTSD amongst a treatment-seeking sample of asylum seekers living in a humanitarian setting in Niger. To this end, the study's aims were to: (1) identify the prevalence of ICD-11 PTSD and CPTSD; (2) determine whether there were any emerging unique latent classes of asylum seekers, and if so, whether these symptom profiles are consistent with the distinct trauma-based diagnoses of the ICD-11; (4) explore whether there were any relationships between a range of socio-demographic, trauma-related, premigration and postmigration variables and the observed classes of posttraumatic symptoms. Based on existing evidence, we hypothesized that: 1) our sample of traumatized treatment-seeking asylum seekers would

present a high prevalence of CPTSD diagnosis; 2) the LCA would identify classes corresponding to the diagnostic criteria of ICD-11 PTSD and CPTSD without a low symptoms class given the treatment-seeking nature of our sample; and 3) both premigration trauma and postmigration stress would uniquely contribute to the emergence of these classes.

Methods

Participants

The data for these analyses were obtained as part of an initial routine assessment of 126 asylum-seekers who were seeking treatment and psycho-social support for trauma-related mental health disorders at clinical units for victims of torture managed by the medical humanitarian NGO Medici per i Diritti Umani (MEDU) in Agadez (Niger). The clinical assessment involved the administration of measures of trauma exposure and PTSD/CPTSD symptoms regardless of patient participation in this study. Niger, located in the southern band of the Sahara Desert, is a country at the heart of intraregional and cross-regional trade and human mobility flows. The city of Agadez, in recent decades, has become an important regional hub for migrants travelling north towards Libya and Algeria (OIM, 2019). To be eligible for the study participants were required to: a) be a refugee or asylum seeker, b) be over the age of 18, c) be in the initial clinical assessment phase and d) be able to speak fluently one of the three study languages (English, French, Arabic). Exclusion criteria were the presence of a psychotic disorder diagnosis and the inability to complete the PTSD symptoms or the trauma exposure questionnaires due to mental disability. Of the 141 patients considered eligible for the study, 15 did not complete the PTSD symptoms or the trauma exposure questionnaires (amongst them, some were transferred to reception centers located in other cities [n=11], some others left the reception centers autonomously [n=4] before finishing the evaluation sessions) and therefore they were not included in the sample. The final sample size was 126 participants. Gender ($\chi 2 = .71$, $p = .57$) and age (two sample t-test;

p = .12) distribution of the 15 patients not included did not show significant differences with the sample group of this study. Data was collected between May 2019 and April 2021. The sample comprised 95 men (75.4%) and 31 women (24.6%). Participants in this study had a mean age of 26.12 years (*SD* = 6.88). Participants were from seven countries: Sudan (n = 108, 85.7%); Cameroun (n = 7; 5.5%); Central African Republic (n = 5, 4.0%); Mali (n = 2, 1.6%); Togo (n = 2, 1.6%); Burkina Faso (n = 1, 0.8%); Palestine (n = 1, 0.8%).

As concerns the migratory routes, the vast majority of participants (n = 104, 82.5%) reported having fled from Sudan reaching Niger via Chad and Libya, in routes controlled by smuggling or trafficking networks (UNHCR, 2021). They had a common history in which the traumatic events were essentially distributed in two phases: 1) in Sudan, where they were victims of the violence of the civil war often experiencing simultaneously situations such as combat situations as civilians, being close to death, murder of a family member or friend or stranger, fires and explosions, forced separation from family members; 2) on the migratory route (particularly in Libya), where they were often subjected to imprisonment and torture.

Participants had been residing in Niger for an average of 21.66 months (*SD* = 9.74). The majority of participants were unemployed (94.4%; n = 119) with a mean of 5.70 years of education (*SD* = 4.54; range 0-18 years) and resided in Niger without family members (72.2%; n = 91). Regarding legal status, all the participants were asylum seekers. Regarding residence, participants were hosted in one of these two types of facilities: 1) Humanitarian Site (i.e., large reception camp *in the desert surroundings of Agadez*) with over 1,000 guests (70.6%; n = 89); 2) *Cases de Passage* (i.e., small reception facilities in the urban center of Agadez) with less than 100 guests (29.4%; n = 37).

Measures

Trauma exposure. We assessed trauma exposure using a 23-item instrument developed by Nickerson and colleagues (2016). This scale indexed exposure to traumatic

events commonly experienced by asylum seekers and refugees. Participants were asked to indicate: 1) whether they had experienced or witnessed any of the events personally, and 2) at what age they experienced or witnessed the first traumatic event. Overall trauma exposure was represented by a count of the number of traumatic event types each participant experienced (possible range: 0–23).

PTSD and CPTSD symptoms. We assessed symptoms of PTSD and CPTSD using the International Trauma Questionnaire (ITQ), a 12-item self-report measure that focuses on the core features of PTSD and CPTSD, as they have been formulated in the ICD-11 (Cloitre et al., 2018). After describing the index trauma as the most troubling personal life event, individuals complete six items that measure three clusters of PTSD symptoms: re-experiencing, avoidance, and sense of threat. Six further items measure three clusters of DSO symptoms: affective dysregulation, negative self-concept, and disturbances in relationships. In addition, individuals rate their functional impairment associated with PTSD symptoms and DSO symptoms (three items each), as reported in the last month. All items are scored on a five-point scale, from 'not at all applicable' (0) to 'extremely applicable' (4), and endorsement of a symptom requires a score of at least 2. Meeting criteria for PTSD requires endorsement of at least one symptom for each of the three PTSD symptom clusters, and endorsement of at least one symptom of functional impairment associated with PTSD symptoms. Meeting criteria for DSO requires endorsement of at least one symptom for each of the three DSO symptom clusters, and endorsement of at least one symptom of functional impairment associated with DSO symptoms. PTSD is diagnosed if criteria are met for PTSD and not for DSO, whereas CPTSD is diagnosed if criteria are met for both PTSD and DSO. The internal reliability of the PTSD (Cronbach's $\alpha = 0.70$) and DSO (Cronbach's $\alpha = 0.86$) subscales and CPTSD full scale (Cronbach's $\alpha = 0.87$) were satisfactory in the current sample. A summed total score of functional impairment was also calculated, whereby higher

scores reflect higher levels of impairment. The functional impairment items demonstrated good internal reliability (Cronbach's $\alpha = 0.88$).

Procedure

This study was approved by the Ethics Committee of the Department of Dynamic and Clinical Psychology at Sapienza University of Rome (Rome, Italy). Before attending the study session, participants first completed written informed consent. Measures were administered within a clinical setting as a standard clinical assessment. Participants provided sociodemographic details first, after which they completed, in the following order, the ITQ and the trauma exposure questionnaires. The translated versions of the questionnaires were read out loud for the participants to avoid possible reading disabilities. Participants listened to each item and possible responses in the three study languages (i.e. Arabic, English, French). Participants then vocalized their response. The research assessment lasted about 60 to 90 minutes. Participants were assisted by a team which included a trained interpreter/cultural mediator, a medical doctor and/or a clinical psychologist with a minimum of 3 years' experience in mental health work with refugees.

Data analysis

The analytical plan for the current study included three steps, where each step corresponded to one of the three study objectives. First, prevalence estimate of ICD-11 PTSD and CPTSD were calculated along with assessments of gender differences using a chi-square analysis.

Second, latent class analysis (LCA) was used to model symptom profiles of PTSD and DSO. We conducted LCA on the basis of 12 dichotomous indicators of ITQ defined PTSD and DSO symptoms, derived from scores on the standard ITQ measure. Six latent class models were tested (1– 6 classes) using the EM and Newton-Raphson algorithms to maximize the latent class model log-likelihood function. The fit for each model was

determined using conventional indices, including the Akaike's information criterion (AIC), Bayesian information criterion (BIC), and the sample size–adjusted Bayesian information criterion (SS-BIC), where lower values indicate better fit. We also used the entropy score (higher levels suggest better fit) and the bootstrap likelihood ratio test (BLRT, with significant values indicating that the *k* model fits the data better than the *k*-1 model), as well as interpretability and parsimony considerations. Consistent with previous research employing LCA (Forbes et al., 2015; Galatzer-Levy, Nickerson, Litz & Marmar et al., 2013; Nickerson et al., 2014), the following values were used to evaluate symptom probabilities of endorsement: values ≥0.60 (high probability); values ≤0.59 and ≥0.16 (moderate probability); and values ≤0.15 (low probability).

Third, to elucidate predictors of LCA class membership, a number of variables were regressed on the derived classes in the conditional model. We restricted the number of predictors given the moderate sample size, focusing on core demographic, trauma exposure, and postmigration factors. Covariates included in the multinomial logistic regression were: gender (1 = female participants, 0 = male participants), age, years of education, functional impairment, age of first trauma, number of traumatic event types, employment (1 = employed, 0 = unemployed), reception condition (1 = large reception center >1,000 people, 0 = small reception center <100 people), presence of the family in the postmigration environment (with family=1; alone=0). All the analyses were performed with the statistical software R (version 3.5.2).

Results

Exposure to trauma and diagnostic rates

The sample was highly trauma exposed as the participants had been exposed to a mean of 9.74 (*SD* = 2.54) types of traumatic events including torture (83.3%; n = 105), being close to death (81.0%; n = 102), murder of a family member or friend (77.0%; n = 97),

combat situation as civilian (72.2%; n = 91). All the participants were survivors of at least one interpersonal traumatic event in their country and/or in the migratory route (particularly in Libya; see online supplemental materials for frequency of exposure to specific trauma types). The mean age of the first traumatic event was 14.19 years (*SD* = 8.34). According to the ICD-11 criteria, the participants had the following diagnosis: CPTSD (74.6%; n = 94); PTSD (19.8%; n = 25); DSO (1.6%; n = 2) and no diagnosis (4.0%; n = 5; see online supplemental materials for frequencies and percentages of participants meeting diagnostic criteria for each PTSD and DSO symptom). There were no significant gender differences in the diagnostic rates for PTSD (χ^2 = 2.18, df = 1, *p* = .139, OR = 2.02) or CPTSD (χ^2 = 1.02, df = 1, *p* = .312, OR = 1.58).

LCA results

The fit statistics for the LCA analyses are reported in Table 1. The 2-class solution produced the lowest values for the BIC, SS-BIC and the BLRT became non-significant for the 3-class solution. The lowest AIC was for the 4- class solution, although the difference was small compared to the 2-class solution. The 2-class solution was judged the best model based on the BIC, BLRT (Nylund, Asparouhov, & Muthén, 2007), parsimony and interpretability. The profile plot for this solution and probabilities of PTSD and DSO symptoms endorsement for each class are presented in Figure 1. As shown in Figure 1, Class 1 (69.0%, n = 87) was the largest class and was characterized by high probabilities of meeting the diagnostic criteria for each of the PTSD and DSO symptoms. This class was labelled the 'CPTSD' class. Class 2 (31.0%, n = 39) was the smallest class and was characterized by: (1) high probabilities of meeting all the diagnostic criteria for PTSD symptoms with the exception of moderate probability of the symptom "Feeling jumpy or easily startled"; (2) moderate probabilities of meeting all the diagnostic criteria for DSO symptoms with the exception of high probability

of the symptom “When I am upset, it takes me a long time to calm down.”. This class was labelled the ‘PTSD’ class.

[Insert Table 1 and Figure 1 Here]

Multinomial logistic regression analysis

Descriptive statistics on the covariates in the full sample and each LCA latent class are shown in supplemental material. The full results of the multinomial logistic regression are presented in Table 2. The ‘PTSD’ class was treated as the reference category for these analyses. The model as a whole was statistically significant ($\chi^2 = 59.09$, df = 9, $p < .001$) and explained 52.7% of variance in class membership (Nagelkerke = 0.527). Of the nine predictors in the model *only three were significantly associated with class membership: age of the first trauma, reception condition and functional impairment. Those in the CPTSD class were more likely to live in the Humanitarian Site compared to those in the PTSD class (OR = 4.88; 95% CI = 1.49-15.90, p = .009). Moreover, the older age at which the first trauma occurred* was associated with a decreased likelihood of CPTSD class membership (*OR = 0.88; 95% CI = 0.79-0.98, p =* .015) *or, in other terms, the earlier the age of the first trauma, the more probable was he membership in the CPTSD class. Finally,* increased levels of functional impairment were associated with an increased likelihood of CPTSD class membership (*OR = 1.44; 95% CI = 1.23-1.68, p* < .001).

[Insert Table 2 Here]

Discussion

This was the first study examining PTSD and CPTSD symptom profiles in a sample of trauma-exposed asylum seekers in a low income country. The study was specifically conducted in Niger *in a humanitarian setting (i.e., in a large, isolated humanitarian camp* and in a number of small urban hosting facilities).

According to the ICD-11 criteria the rate of probable CPTSD (74.6%) was higher in

the current sample than in previous studies on asylum-seekers and refugees (Barbieri et al., 2019; Frost et al., 2018; Hecker et al, 2018; Hyland et al.,2018; Liddell et al., 2019; Vang et al., 2019). As a general consideration, the high rates of CPTSD in our study was likely due to the fact that the sample was composed of treatment-seeking individuals who survived multiple traumatic events. Moreover, all the participants were asylum-seekers experiencing prolonged uncertainty about their visa status. At this regard, a recent LCA study on a sample of refugees residing in Australia found that CPTSD class membership was significantly predicted by insecure visa status suggesting that this condition may be specifically associated with the prevalence of DSO symptoms (Liddell et al., 2019). Several studies conducted on asylum seekers and refugees in high-income Western countries point out that visa insecurity is characterized by prolonged uncertainty regarding the future, a lack of control in the refugee determination process (e.g., unclear waiting times for decisions, sudden policy changes requiring new submissions), and elevated postmigration living difficulties (i.e., significant practical barriers, including restricted employment opportunities and access to services, family separation, fear for the future, and social problems including isolation) (Li et al., 2016; Momartin et al., 2006; Morgan, Melluish & Welham et al., 2017; Nickerson, Steel, Bryant, Brooks & Siolve, 2011). Consistent with these observations, we assume that visa insecurity may especially influence DSO symptomatology in a sample of asylum-seekers living in a low income country humanitarian setting where factors such as prolonged uncertainty regarding the refugee determination process (e.g., in our sample two possible different outcomes could be recognition of refugee status with resettlement in a high-income third country, or recognition of status with stay in Niger), concerns for the future and daily living difficulties are pervasive.

Consistent with previous LCA studies on similar samples (Barbieri et al., 2019; Frost et al., 2019; Hyland et al, 2018; Liddell et al., 2019; Vang et al., 2019), the LCA in this study

supported the validity of the *ICD-11* construct of CPTSD in an asylum-seeker sample, represented by co-occurring PTSD and DSO symptoms. A two-class model reflecting the ICD-11 proposal provided the best fit to the data: a CPTSD class (69.0% of the sample) characterized by high probabilities of endorsing all PTSD and DSO symptoms, and a PTSD class (31.0%) characterized by elevated PTSD core symptoms and comparably lower rates of DSO domain scores with the exception of an affective dysregulation item (i.e., when upset, it takes a long time to calm down) which presented an elevated score. Elevated rates of affective dysregulation in addition to PTSD symptoms are consistent with previous studies reporting elevated probabilities of endorsing hyperactivation among the PTSD class in refugee samples (Frost et al., 2019; Hyland et al., 2018; Vang at al., 2019). As argued by Frost and colleagues (2019), it is very likely that individuals who have a high probability of endorsing symptoms that reflect 'a persistent sense of threat' (i.e., being easily startled and being watchful or 'on guard') would also display symptoms of hyperactivity of emotional regulatory functions. Moreover, Vang and colleagues (2019) suggest that the elevated rates of affective dysregulation among the PTSD class might also be reflective of comorbidity or elevated levels of non-specific distress associated with pre, peri and postmigration factors. A low symptoms class was absent in our sample. As initially hypothesized, this can be explained by the treatment-seeking nature of the group selected for the current study and it is consistent with previous LCA studies on treatment-seeking samples of refugees and asylum-seekers (Barbieri at al., 2019; Vang et al., 2019).

As expected, the results of the multinomial logistic regression analysis found that both premigration and postmigration factors may distinguish membership in a CPTSD class over a PTSD class. Among premigration factors, only the age of the first trauma specifically distinguished between the CPTSD and PTSD classes as an earlier age of first trauma was associated with an increased likelihood of CPTSD class membership. This is consistent with

previous research showing that trauma occurring during formative developmental periods create a particular vulnerability to CPTSD (Ben-Ezra et al., 2018; Cloitre et al., 2013; Gilbar, Hyland, Cloitre, & Dekel, 2018; Hyland et al., 2017; Karatzias et al., 2017).

Consistently with all previous LCA studies on asylum seekers and refugees (Barbieri et al., 2019; Frost et al., 2019; Hyland et al., 2018; Liddell et al., 2019; Vang et al., 2019), we found that cumulative trauma exposure (i.e., number of different trauma types experienced) did not distinguish between the CPTSD and PTSD classes. Although early findings indicate that ICD-11 CPTSD is more likely to manifest following cumulative trauma exposure in a dose-response manner (Ben-Ezra et al., 2018; Cloitre et al., 2013; Gilbar et al., 2018; Hyland et al., 2017; Karatzias et al., 2017), this does not appear to be a risk factor capable of predicting membership in the CPTSD class compared to PTSD class in refugee populations.

Moreover, this study found that functional impairment significantly predicted class membership. This finding is consistent with previous studies (Cloitre *et al.*, 2013; Elklit *et al.*, 2014; Murphy *et al.*, 2016; Karatzias *et al.*, 2017), which indicate CPTSD class membership is associated with the highest levels of impairment and distress.

Notably, in our study, reception conditions emerged as a consistent postmigration predictor of CPTSD class. Specifically, living in the Humanitarian Site (i.e., a large reception camp *in the desert surroundings of Agadez*, hosting over 1,000 people) rather than in the *Cases de Passages* (i.e., small reception facilities in the urban center of Agadez, hosting less than 100 people) was associated with an increased likelihood of CPTSD class membership. This finding bolsters the growing literature emphasizing the importance of the postmigration environment on mental health outcomes. In particular, the current study, along with Liddell and colleagues' investigation (2019), first highlights the contribution of the quality of postdisplacement conditions to CPTSD class membership in asylum seekers and refugees.

This finding is consistent with a previous LCA study which investigated PTSD as conceptualized by the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association [APA], 2013) on a sample of treatment-seeking African refugees and asylum-seekers living in Italy (Barbieri et al., 2021). Although the DSM-5 conceptualizes PTSD as a single, broad diagnosis characterized by four symptom clusters ((i.e., intrusions, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity), whereas the ICD-11 proposes two "sibling" disorders (i.e., PTSD and CPTSD), this research also found that membership in a class labelled “Pervasive PTSD”, characterized by high probabilities of all 20 DSM-5 PTSD symptoms, was significantly predicted by the reception conditions, that is, by living in large, isolated reception centres hosting over 1,000 people.

Our finding is also consistent with the ecological model of refugee distress proposed by Miller and Rasmussen (2017) drawing on research demonstrating that mental health among refugees and asylum seekers stems not only from prior traumatic events exposure, but also by an individual's social ecology, encapsulating both displacement-related and ongoing stressors. Indeed, at the moment of our investigation the Humanitarian Site was characterized by a greater number of daily stressors than those of small centers within Agadez: material living difficulties; overcrowding; geographic and social isolation of the facility located in a desert area. All these factors may generate insecurity and fear, anxieties already provoked by past trauma experiences. At this regard, the present study confirms that large reception camps may produce a heavy burden of retraumatizing stressors with detrimental effects on asylum seekers and refugees’ mental health (Barbieri, 2021). This aspect has important implications regarding reception policies and the prevention of trauma-related mental disorders as asylum seekers and refugees are usually hosted for extended periods in huge, isolated and overcrowded reception centers in low income country and recently even in Western high-

income countries. On the contrary, policies that favour reception in small-scale facilities, integration into the social environment and provision of appropriate services would be needed for the benefit of hosted refugees and the receiving societies (Barbieri, 2021).

This study has several methodological limitations. First, our small participant sample size limited the interpretability and generalizability of the findings. While there is no general rule-of-thumb regarding the minimum sample size required to conduct a LCA, the literature have suggested that latent class models should contain distinguishable and interpretable classes (Dziak, Lanza & Tan, 2014). Despite our relatively small sample size, our LCA yielded good fit statistics and an interpretable model. Moreover, the two classes identified by LCA were not only distinguished by symptom presentation, but also each included a substantial percentage of participants. Second, we did not examine other diagnoses (e.g. depression), and it would be useful in future studies to assess the discriminant validity of the CPTSD construct. Third, cumulative trauma was calculated as the number of different trauma types experienced rather than the frequency and severity of individual trauma types preventing a fine-grained analysis of these experiences as predictors of trauma symptomology. On the other hand, a strength of the study is that it is one of the few contemporary investigations focusing on CPTSD in an asylum-seeker population exposed to extreme forms of persecution and human rights violations. Furthermore, the sample of this study presented a comparatively greater cultural, geographical and anamnestic homogeneity with respect to other similar studies. Future researches are required to determine whether the symptom presentations identified in the current study are generalizable across ethnicities or unique to specific ethnic and trauma survivors' groups.

This study provides support for distinctive CPTSD and PTSD symptom profiles in an asylum seeker sample living in a humanitarian setting in a low income country. The findings suggest that both the early age of the first trauma and postmigration stressors (i.e., inadequate

reception conditions in large reception camps) are important predictors of CPTSD symptoms. The finding that prolonged stay in large, isolated facilities presenting several living difficulties plays an important role in predicting CPTSD symptom profile highlights the importance to implement small-medium size reception facilities that provide effective protection, concrete integration, adequate housing and services for the promotion of trauma recovery and positive mental health outcomes for trauma-exposed asylum-seekers and refugees.

Table 1

Latent Class Analysis and Latent Profile Analysis and Fit Indices

	LCA					
Model	log-likelihood	AIC [a]	BIC [a]	SS-BIC [a]	Entropy [b]	BLRT (*p*) [c]
1 class	-611.36	1,246.77	1,280.75	1,300.84	-	-
2 class	-501.99	1,053.98	1,124.88	1,166.73	0.925	.001
3 class	-488.19	1,052.37	1,160.15	1,228.34	0.967	.054
4 class	-475.03	1,052.05	1,196.70	1,290.78	0.893	.502
5 class	-467.25	1,074.56	1,256.08	1,346.16	0.966	.715
6 class	-460.51	1,083.85	1,302.25	1,442.09	0.909	.958

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; SS-BIC = sample size–adjusted BIC; BLRT = bootstrap likelihood ratio test. [a] Lower values indicate better model fit. [b] Higher values are associated with better fit. [c] Tests the significance of successive classes such that significant values indicate the current model (k) is a significantly better fit than the previous model (k-1).

Table 2

Predictors of Class Membership

Class comparison	OR	95% CI		*p*
		Lower	Upper	
CPTSD vs. PTSD				
Years of education	0.91	0.81	1.02	.119
Functional impairment	1.44	1.23	1.68	< .001
Age	1.03	0.91	1.16	.656
Age of first trauma	0.88	0.79	0.98	.015
Gender (F)	1.86	0.32	10.81	.489
Employment	0.61	0.08	4.37	.620
Reception condition (Large Center > 1,000 guests)	4.88	1.49	15.90	.009
Number of trauma types	0.88	0.70	1.10	.268
Familiar condition (with family)	0.32	0.06	1.68	.181

Note. OR = odds ratio; CI = confidence interval; PTSD = posttraumatic stress disorder; CPTSD = complex PTSD

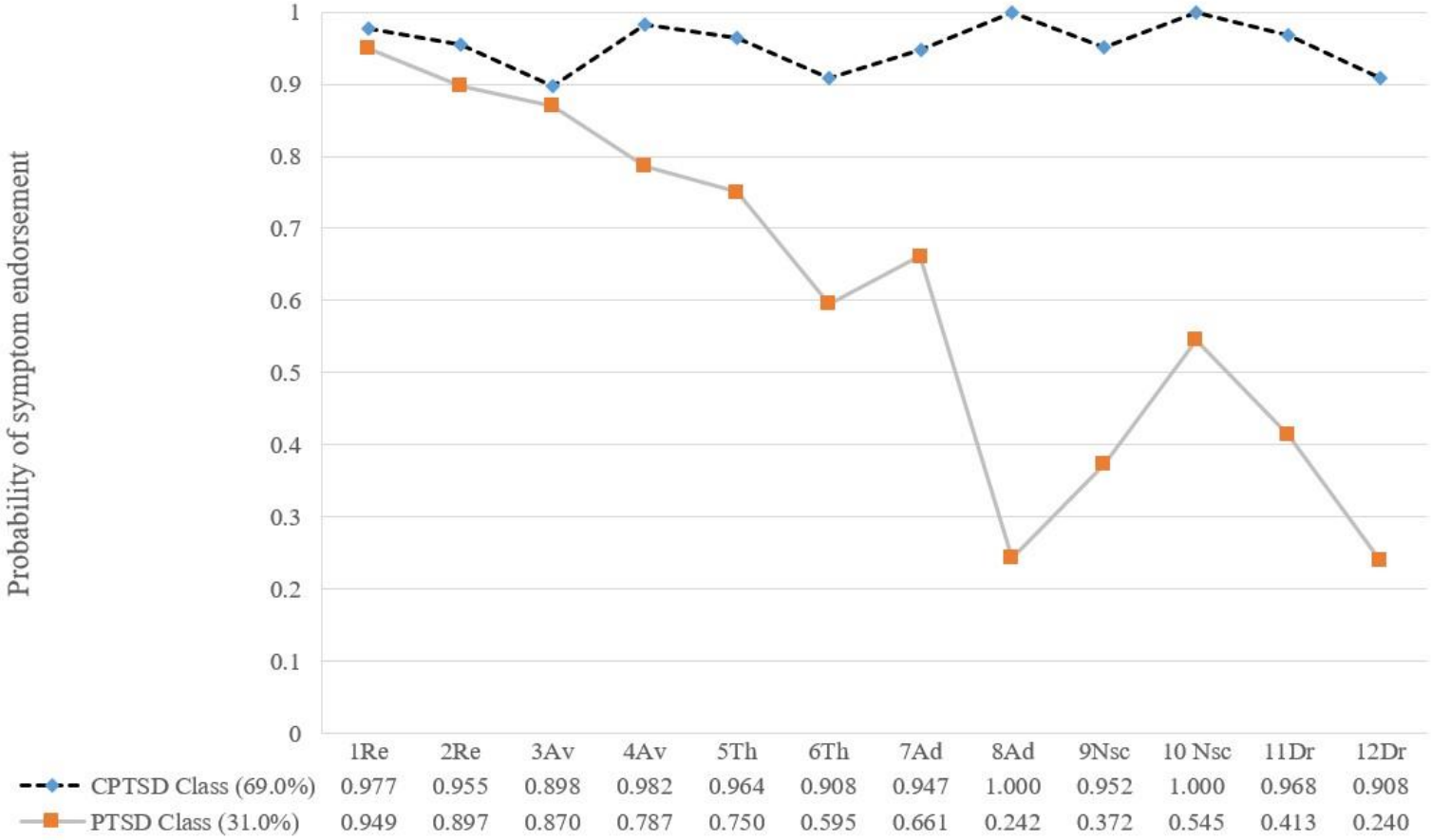

Figure 1. Probabilities of posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD) symptom endorsement for each of the two latent classes.

Note. Re = re-experiencing; Av = avoidance; Th = sense of threat; Ad = affect dysregulation; Nsc = negative self-concept; Dr = disturbances in relationships.

References

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.

Barbieri A. (2021). Time to rethink large refugee centres in Europe. *The Lancet. Public health*, *6*(1), e8. https://doi.org/10.1016/S2468-2667(20)30255-3

Barbieri, A., Visco-Comandini, F., Alunni Fegatelli, D., Dessì, A., Cannella, G., Stellacci, A., & Pirchio, S. (2021). Patterns and predictors of PTSD in treatment-seeking African refugees and asylum seekers: A latent class analysis. *The International journal of social psychiatry*, *67*(4), 386–396. https://doi.org/10.1177/0020764020959095

Barbieri, A., Visco-Comandini, F., Alunni Fegatelli, D., Schepisi, C., Russo, V., Calò, F., Dessì, A., Cannella, G., Stellacci A. (2019). Complex trauma, PTSD and complex PTSD in African refugees *Eur J Psychotraumatol*; 10(1):1700621. DOI: 10.1080/20008198.2019.1700621

Ben-Ezra, M., Karatzias, T., Hyland, P., Brewin, C. R., Cloitre, M., Bisson, J. I., . . . Shevlin, M. (2018). Posttraumatic stress disorder (PTSD) and complex PTSD (CPTSD) as per ICD-11 proposals: A population study in Israel. *Depress Anxiety*, *35*(3), 264-274. http://dx.doi.org/10.1002/da.22723

Brewin, C. R., Cloitre, M., Hyland, P., Shevlin, M., Maercker, A., Bryant, R. A., … Reed, G. M. (2017). A review of current evidence regarding the ICD-11 proposals for diagnosing PTSD and complex PTSD. *Clinical Psychology Review*, 58, 1–15.DOI: 10.1016/j.cpr.2017.09.001

Bryant R. A. (2012). Simplifying complex PTSD: comment on Resick et al. (2012). *Journal of traumatic stress*, *25*(3), 252–263. https://doi.org/10.1002/jts.21696

Cloitre M. (2016). Commentary on De Jongh et al. (2016) critique of ISTSS complex PTSD guidelines: Finding the way forward. Depression and Anxiety, 33(5), 355–356.DOI: 10.1002/da.22493

Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European journal of psychotraumatology, 4*(1), 20706. http://dx.doi.org/10.3402/ejpt.v4i0.20706

Cloitre M., Garvert D. W., Weiss B., Carlson E. B., & Bryant R. A. (2014). Distinguishing PTSD, complex PTSD, and borderline personality disorder: A latent class analysis. *European Journal of Psychotraumatology*, 5, 25097.DOI: 10.3402/ejpt.v5.25097

Cloitre, M., Shevlin,M., Brewin, C. R.,Bisson, J. I.,Roberts, N. P.,&Maercker, A. (2018). The International Trauma Questionnaire (ITQ): Development of a self-report measure of ICD-11 PTSD and Complex PTSD. *Acta Psychiatr Scand*, *138*(6), 536–546. https://doi.org/10.1111/acps.12956

de Jong J. T., Komproe I. H., Spinazzola J., van der Kolk B. A., & van Ommeren M. H. (2005). DESNOS in three postconflict settings: Assessing cross-cultural construct equivalence. *Journal of Traumatic Stress*, 18(1), 13–21. DOI: 10.1002/jts.20005

Dziak JJ, Lanza ST, Tan X. Effect Size, Statistical Power and Sample Size Requirements for the Bootstrap Likelihood Ratio Test in Latent Class Analysis. Struct Equ Modeling. 2014 Jan 1;21(4):534-552. doi: 10.1080/10705511.2014.919819. PMID: 25328371; PMCID: PMC4196274.

Forbes, D., Nickerson, A., Alkemade, N., Bryant, R.A., Creamer, M., Silove, D., O'Donnell M. (2015). Longitudinal analysis of latent classes of psychopathology and patterns of class migration in survivors of severe injury. *J Clin Psychiatry*; 76, 1193–1199.DOI: 10.4088/JCP.14m09075

Frost, R., Hyland, P., McCarthy, A., Halpin, R., Shevlin, M., & Murphy, J. (2019). The complexity of trauma exposure and response: Profiling PTSD and CPTSD among a refugee sample. *Psychological trauma: theory, research, practice and policy*, *11*(2), 165–175. https://doi.org/10.1037/tra0000408

Galatzer-Levy, I.R., Nickerson, A., Litz, B.T., Marmar, C.R. (2013). Patterns of lifetime PTSD

comorbidity: a latent class analysis. *Depress Anxiety*; 30, 489–496.DOI: 10.1002/da.22048

Gilbar, O. (2020). Examining the boundaries between ICD11 PTSD/CPTSD and depression and anxiety symptoms: A network analysis perspective. Journal of Affective Disorders, 262, 429–439.DOI: 10.1016/j.jad.2019.11.060

Gilbar, O., Hyland, P., Cloitre, M., & Dekel, R. (2018). ICD-11 complex PTSD among Israeli male perpetrators of intimate partner violence: Construct validity and risk factors. *J Anxiety Disord*, *54*, 49-56. http://dx.doi.org/10.1016/j.janxdis.2018.01.004

Hecker, T., Huber, S., Maier, T., & Maercker, A. (2018). Differential associations among PTSD and complex PTSD symptoms and traumatic experiences and postmigration difficulties in a culturally diverse refugee sample. Journal of Traumatic Stress, 31(6), 795–804.

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. Journal of Traumatic Stress, 5, 377–391.

Herman J. (2012). CPTSD is a distinct entity: comment on Resick et al. (2012). *Journal of traumatic stress*, *25*(3), 256–263. https://doi.org/10.1002/jts.21697

Ho, G. W. K., Bressington, D., Karatzias, T., Chien, W. T., Inoue, S., Yang, P. J., … Hyland, P. (2020). Patterns of exposure to adverse childhood experiences and their associations with mental health: A survey of 1346 university students in East Asia. Social Psychiatry and Psychiatric Epidemiology, 55(3), 339–349.DOI: 10.1007/s00127-019-01768-w

Hyland, P., Ceannt, R., Daccache, F., Abou Daher, R., Sleiman, J., Gilmore, B., Byrne, S., Shevlin, M., Murphy, J., & Vallières, F. (2018). Are posttraumatic stress disorder (PTSD) and complex-PTSD distinguishable within a treatment-seeking sample of Syrian refugees living in Lebanon?. *Global mental health (Cambridge, England)*, *5*, e14. https://doi.org/10.1017/gmh.2018.2

Hyland P., Murphy J., Shevlin M., Vallières F., McElroy E., Elklit A., … Cloitre M. (2017b). Variation in post-traumatic response: The role of trauma type in predicting ICD-11

PTSD and CPTSD symptoms. *Social Psychiatry and Psychiatric Epidemiology*, 52(6), 727–736. DOI: 10.1007/s00127-017-1350-8

Hyland, P., Shevlin, M., Brewin, C. R., Cloitre, M., Downes, A. J., Jumbe, S., … Roberts, N. P. (2017a). Validation of post-traumatic stress disorder (PTSD) and complex PTSD using the international trauma questionnaire. *Acta Psychiatrica Scandinavica*, 136(3), 313–322.DOI: 10.1111/acps.12771

Hyland, P., Shevlin, M., Elklit, A., Murphy, J., Vallières, F., Garvert, D. W., & Cloitre, M. (2017). An assessment of the construct validity of the ICD-11 proposal for complex posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy, 9*(1), 1. http://dx.doi.org/10.1037/tra0000114

IOM UN Migration (2019). Migration trends from, to and within the Niger 2016-2019. https://publications.iom.int/system/files/pdf/iom-niger-four-year-report.pdf

Jowett, S., Karatzias, T., Shevlin, M., & Albert, I. (2019). Differentiating symptom profiles of ICD-11 PTSD, complex PTSD, and borderline personality disorder: A latent class analysis in a multiply traumatized sample. *Personality Disorders: Theory, Research, and Treatment*, 36–45. doi:10/gf8mxd.

Karatzias, T., Shevlin, M., Fyvie, C., Hyland, P., Efthymiadou, E., Wilson, D., … Cloitre, M. (2016). An initial psychometric assessment of an ICD-11 based measure of PTSD and complex PTSD (ICD-TQ): Evidence of construct validity. Journal of Anxiety Disorders, 44, 73–79. DOI: 10.1016/j.janxdis.2016.10.009

Karatzias, T., Shevlin, M., Fyvie, C., Hyland, P., Efthymiadou, E., Wilson, D., … Cloitre, M. (2017). Evidence of distinct profiles of posttraumatic stress disorder (PTSD) and complex posttraumatic stress disorder (CPTSD) based on the new ICD-11 trauma questionnaire (ICD-TQ). Journal of Affective Disorders, 207, 181–187.DOI: 10.1016/j.jad.2016.09.032

Kazlauskas, E., Gegieckaite, G., Hyland, P., Zelviene, P., & Cloitre, M. (2018). The structure of ICD-11 PTSD and complex PTSD in Lithuanian mental health services. European Journal of Psychotraumatology, 9(1),1414559.DOI: 10.1080/20008198.2017.1414559

Knefel M, Garvert DW, Cloitre M, Lueger-Schuster B. Update to an evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse by Knefel & Lueger-Schuster (2013): a latent profile analysis. Eur J Psychotraumatol. 2015 Jan 2;6:25290. doi: 10.3402/ejpt.v6.25290. PMID: 25557561; PMCID: PMC4283031.

Knefel, M., Karatzias, T., Ben-Ezra, M., Cloitre, M., LuegerSchuster, B., & Maercker, A. (2019). The replicability of ICD-11 complex post-traumatic stress disorder symptom networks in adults. The British Journal of Psychiatry, 214(6), 361–368.DOI: 10.1192/bjp.2018.286

Knefel, M., Lueger-Schuster, B., Bisson, J., Karatzias, T., Kazlauskas, E., & Roberts, N. P. (2020). A cross-cultural comparison of ICD-11 complex posttraumatic stress disorder symptom networks in Auria, the UK, and Lithuania. Journal of Traumatic Stress, 33(1), 41–51.DOI: 10.1002/jts.22361

Knefel, M., Tran, U. S., & Lueger-Schuster, B. (2016). The association of posttraumatic stress disorder, complex posttraumatic stress disorder, and borderline personality disorder from a network analytical perspective. Journal of Anxiety Disorders, 43, 70–78.DOI: 10.1016/j.janxdis.2016.09.002

Li, S. S., Liddell, B. J., & Nickerson, A. (2016). The Relationship Between Post-Migration Stress and Psychological Disorders in Refugees and Asylum Seekers. *Current psychiatry reports*, *18*(9), 82. https://doi.org/10.1007/s11920-016-0723-0

Liddell, B. J., Nickerson, A., Felmingham, K. L., Malhi, G. S., Cheung, J., Den, M., Askovic, M., Coello, M., Aroche, J., & Bryant, R. A. (2019). Complex Posttraumatic Stress Disorder Symptom Profiles in Traumatized Refugees. *Journal of traumatic stress*, *32*(6), 822–832. https://doi.org/10.1002/jts.22453

Maercker A., Brewin C. R., Bryant R. A., Cloitre M., Reed G. M., Van Ommeren M., … Saxena S. (2013). Proposals for mental disorders specifically associated with stress in the international classification of diseases-11. *The Lancet*, 381(9878), 1683–1685. https://doi.org/10.1016/S0140-6736(12)62191-6

McElroy, E., Shevlin, M., Murphy, S., Roberts, B., Makhashvili, N., Javakhishvili, J., … Hyland, P. (2019). ICD-11 PTSD and complex PTSD: Structural validation using network analysis. *World Psychiatry*, 18(2), 236–237.DOI: 10.1002/wps.20638

Miller, K.E., Rasmussen, A. (2017). The mental health of civilians displaced by armed conflict: an ecological model of refugee distress. *Epidemiol Psychiatr Sci*, 26, 129–138.DOI: 10.1017/S2045796016000172

Mollica, R. F., Caspi-Yavin, Y., Bollini, P., Truong, T., Tor, S., & Lavelle, J. (1992). The Harvard Trauma Questionnaire. Validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochines refugees. The Journal of Nervous and Mental Disease, 180(2), 111–116.

Momartin, S., Steel, Z., Coello, M., Aroche, J., Silove, D., & Brooks, R. (2006). A comparison of the mental health of refugees with temporary versus permanent protection visas. *Medical Journal of Australia*, *185*, 357–361. https://doi.org/10.5694/j.1326-5377.2006.tb00610.x

Morgan, G., Melluish, S., & Welham, A. (2017). Exploring the relationship between postmigratory stressors and mental health for asylum seekers and refused asylum seekers in the UK. *Transcultural psychiatry*, *54*(5-6), 653–674. https://doi.org/10.1177/1363461517737188

Murphy, D., Shevlin, M., Pearson, E., Greenberg, N., Wessely, S., Busuttil, W., & Karatzias, T. (2020). A validation study of the international trauma questionnaire to assess post-traumatic stress disorder in treatment-seeking veterans. *The British Journal of Psychiatry*, 216(3), 132–137. DOI: 10.1192/bjp.2020.9

Nickerson, A., Cloitre, M., Bryant, R. A., Schnyder, U., Morina, N., & Schick, M. (2016). The factor structure of complex posttraumatic stress disorder in traumatized refugees. *European*

journal of psychotraumatology, *7*, 33253. https://doi.org/10.3402/ejpt.v7.33253

Nickerson, A., Liddell, B.J., Maccallum, F., Steel, Z., Silove, D., Bryant, R.A. (2014). Posttraumatic stress disorder and prolonged grief in refugees exposed to trauma and loss. *BMC Psychiatry*; 14, 106

Nickerson, A., Steel, Z., Bryant, R., Brooks, R., & Silove, D. (2011). Change in visa status amongst Mandaean refugees: relationship to psychological symptoms and living difficulties. *Psychiatry research*, *187*(1-2), 267–274. https://doi.org/10.1016/j.psychres.2010.12.015

Owczarek, M., Ben-Ezra, M., Karatzias, T., Hyland, P., Vallieres, F., & Shevlin, M. (2020). Testing the factor structure of the international trauma questionnaire (ITQ) in African community samples from Kenya, Ghana, and Nigeria. *Journal of Loss and Trauma*, 25(4), 348–363.https://doi.org/10.1080/15325024.2019.1689718

Palic S., & Elklit A. (2014). Personality dysfunction and complex posttraumatic stress disorder among chronically traumatized Bosnian refugees. *The Journal of Nervous and Mental Disease*, 202(2), 111–118. DOI: 10.1097/NMD.0000000000000079

Perkonigg A., Hofler M., Cloitre M., Wittchen H. U., Trautmann S., & Maercker A. (2016). Evidence for two different ICD-11 posttraumatic stress disorders in a community sample of adolescents and young adults. *European Archives of Psychiatry and Clinical Neurosciences*, 266(4), 317–328.DOI: 10.1007/s00406-015-0639-4

Resick, P. A., Bovin, M. J., Calloway, A. L., Dick, A. M., King, M. W., Mitchell, K. S., … Wolf, E. J. (2012). A critical evaluation of the complex PTSD literature: Implications for DSM-5. *Journal of Traumatic Stress*, 25(3), 241–251. DOI: 10.1002/jts.21699

Rink, J., & Lipinska, G. (2020). Evidence of distinct profiles of ICD-11 post-traumatic stress disorder (PTSD) and complex PTSD in a South African sample. *European journal of psychotraumatology*, *11*(1),1818965. https://doi.org/10.1080/20008198.2020.1818965

UNHCR (2021). Refugees and asylum seekers in Agadez. https://reporting.unhcr.org/sites/

default/files/Niger- Mixed%20Movements%20Factsheet-June_July%202021.pdf

Vang, M. L., Nielsen, S. B., Auning-Hansen, M., & Elklit, A. (2019). Testing the validity of ICD-11 PTSD and CPTSD among refugees in treatment using latent class analysis. *Torture Journal*, 29(3), 27-45.DOI: 10.7146/torture.v29i3.115367

Wolf, E. J., Miller, M. W., Kilpatrick, D., Resnick, H. S., Badour, C. L., Marx, B. P., Keane, T. M., Rosen, R. C., & Friedman, M. J. (2015). ICD-11 Complex PTSD in US National and Veteran Samples: Prevalence and Structural Associations with PTSD. *Clinical psychological science: a journal of the Association for Psychological Science*, *3*(2), 215–229. https://doi.org/10.1177/2167702614545480

World Health Organization. (2019). *International classification of diseases* 11th ed. Retrieved from https://icd.who.int/en

Supplemental Table 1
Trauma Exposure Reported by Asylum Seekers

Trauma Type	*n*	*%*
Lack of shelter	117	92.8
Torture	109	86.5
Being close to death	101	90.0
Murder of a family member or friend	99	78.6
Lack of food or water	97	77.0
Forced separation from family member	94	74.6
Combat situation	93	73.8
Murder of one or more strangers	87	69.0
Imprisonment	87	69.0
Non-sexual assault	85	67.5
Serious accident, fire or explosion	48	38.1
Serious physical injury	48	38.1
Ill health without access to medical care	40	31.7
Sexual assault by a stranger	38	30.2
Disappearence or kidnapping	29	23.0
Unnatural death of a family member or friend	20	15.9
Sexual contact when you were younger than 18 with someone who was 5 or more years older than you	14	11.1
Enforced isolation from others	4	3.2
Non-sexual assault by a family member or someone you know	2	1.6
Life-threating illness	2	1.6
Brainwashing	1	0.8
Sexual assault by a family member or someone you know	0	0.0
Natural disaster	0	0.0

Supplemental Table 2

Frequencies and percentages of asylum seekers meeting diagnostic criteria for each Posttraumatic Stress Disorder (PTSD) and Disturbances in Self-Organization (DSO) symptom

Cluster	Symptom	*n*	%
PTSD			
Re-experiencing	Having upsetting dreams	122	96.8
	Having powerful images and memories	118	93.6
Avoidance	Avoiding internal reminders	112	88.9
	Avoiding external reminders	116	92.1
Sense of current threat	Being 'super-alert', watchful or on guard	113	89.7
	Feeling jumpy or easily startled	102	80.9
DSO			
Affective dysregulation	Long time to calm down when upset	108	85.7
	Feeling numb or emotionally shut down	96	76.2
Negative self-concept	Feeling like a failure	97	77.0
	Feeling worthless	108	85.7
Disturbances in relationships	Feeling distant or cut-off from people	100	79.4
	Finding it hard to stay emotionally close to people	88	69.8

Supplemental Table 3

Descriptive Statistics for the Covariates and ITQ Symptoms and Impairment in the Full Sample and Each Latent Class (LCA)

	Full sample N = 126		*PTSD n =39*		*CPTSD n = 87*	
Covariate	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Years of education	5.69	4.54	6.15	5.02	5.49	4.32
Age	26.12	6.79	28.72	8.25	24.95	5.72
Age of first trauma	14.19	8.34	19.02	9.07	12.02	7.02
Number of trauma types	9.74	2.53	9.25	2.69	9.95	2.42
Functional impairment	15.52	4.16	12.38	3.98	16.93	3.42
Gender	M = 95 (75.4%)		M = 29 (74.4%)		M = 66 (75.9%)	
	F = 31 (24.6%)		F = 10 (25.6%)		F = 21 (24.1%)	
Employment	No = 119 (94.4%)		No = 35 (89.7%)		No = 84 (96.5%)	
	Yes = 7 (5.6%)		Yes = 4 (10.3%)		Yes = 3 (3.5%)	
Reception center	Small = 35 (27.8%)		Small = 18 (46.2%)		Small = 18 (20.7%)	
	Large = 91 (72.2%)		Large = 21 (53.8%)		Large = 69 (79.3%)	
With family	No = 91 (72.2%)		No = 27 (69.2%)		No = 64 (73.6%)	
	Yes = 35 (27.8%)		Yes = 12 (30.8%)		Yes = 23 (26.4%)	
ITQ diagnosis	No = 5 (4.0%)		No = 4 (10.2%)		No = 1 (1.1%)	
	DSO = 2 (1.6%)		DSO = 1 (2.6%)		DSO = 1 (1.1%)	
	PTSD = 25 (19.8%)		PTSD = 25 (64.1%)		PTSD = 0 (0.0%)	
	CPTSD = 94 (74.6%)		CPTSD = 9 (23.1%)		CPTSD = 85 (97.8%)	
Mean ITQ symptoms score	30.71	7.82	22.36	4.86	34.45	5.72
Mean IQ impairment	15.52	4.16	12.38	3.98	16.93	3.42

score