

# Evidence-Based Care for Iraqi, Kurdish, and Syrian Asylum Seekers and Refugees of the Syrian Civil War: A Systematic Review

Cisse Nakeyar and Paul A. Frewen  
Western University

We conducted a systematic review of literature reporting on the prevalence of assessment measures, treatments, and biomarkers used in the diagnosis and treatment of posttraumatic stress disorder (PTSD) in Iraqi, Kurdish, and Syrian refugees. We performed a search of medical, psychological, and sociological databases on all relevant literature published between January 2011 and March 2016. Seventeen manuscripts met the study inclusion criteria. Seven assessment measures were used in more than 1 study, 4 of which were clinically administered (Vivo Checklist of War, Detention, and Torture; Clinically Administered PTSD Scale (CAPS); Mini International Neuropsychiatric Interview; and Hamilton Depression Rating Scale), and 3 of which were self-report measures (Harvard Trauma Questionnaire (HTQ); Hopkins Symptom Checklist-25 (HSCL-25); Post Migrational Living Difficulties (PMLD)). Two studies reported on psychological treatment, both of which administered Narrative Exposure Therapy (NET); no other systematic psychological treatments were identified. Several biomarkers were investigated but only in a single study each, including magnetic resonance imaging (MRI) of lateral prefrontal regions, right inferior parietal cortex, and bilateral isthmus of the cingulate, EEG event-related potentials, hypercortisolemia, and elevated heart rate. On the basis of these findings, we advocate the use of the HTQ, HSCL-25, and PMLD to exclude PTSD noncases and the CAPS for diagnosis of PTSD in Iraqi, Kurdish, and Syrian refugees in Canada. We further suggest NET as the psychological treatment currently with the strongest evidence base in this population. Finally, we advocate continued research into biomarkers as a means of improving and objectifying psychological assessment and treatment of PTSD in Canadian refugee populations.

**Keywords:** posttraumatic stress disorder (PTSD), refugees, psychological assessment, Narrative Exposure Therapy (NET), biomarkers

The start of the Syrian Civil War in 2011 displaced many from their homes. In the years since, Western countries have received an influx of Syrian asylum seekers and refugees. The United Nations High Commissioner for Refugees (UNHCR) defines an *asylum seeker* as someone who claims to be a refugee without those claims being verified (UNHCR, 1951). Thus, as these displaced people wait to qualify for international protection they are classed as asylum seekers. Consequently, a refugee is defined by the UNHCR as someone who

owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country. (UNHCR, 1951, p. 3, para. 1)

A recent poll by the UNHCR (2015) estimated there were 15.1 million refugees and 2.3 million asylum seekers worldwide by mid-2015, the highest rates recorded in 20 years, with Syrian refugees being the largest source by mid-2015 (4.2 million, ap-

proximately 24.1%). As part of the newly elected Canadian government's plan to resettle 25,000 refugees from Syria to Canada, it is crucial that such individuals are looked after for their humanitarian needs, including mental health.

To determine whether an asylum seeker qualifies as a refugee they must demonstrate a well-founded fear of persecution in their home country, and the legitimacy of this claim is determined by the host country. The refugee status determination is conducted by the state or the UNHCR—if the state is unable or unwilling. Once refugee status is awarded, refugees that are deemed low risk by the UNHCR or the state are contacted to determine whether they are interested in being resettled to Canada. Canadian visa officers process refugees overseas in Beirut or Amman, interviewing interested refugees and conducting a full medical examination. As well, interested refugees undergo a security screening against immigration, law enforcement, and security databases using biometrics. Following that, refugee identification is verified before departure to the host country and once again upon arrival (Ministry of Justice Canada, 2001). As can be expected on the basis of the requirement of fear of persecution by one's home country in determining refugee status, elevated rates of posttraumatic stress disorder (PTSD) in refugees have been documented (Teodorescu et al., 2012). Moreover, interestingly, previous studies found that asylum seekers experienced more traumatic life events when compared to refugees and that PTSD symptom severity is predicted by a lack of refugee status (vs. asylum seeking status) and the number of traumatic life events experienced (Knipscheer et al., 2015; Nickerson et al.,

---

Cisse Nakeyar and Paul A. Frewen, Department of Psychology, Western University.

Correspondence concerning this article should be addressed to Paul A. Frewen, University Hospital (Rm B3-264), 339 Windermere Rd, London, Ontario, Canada N6A 5A5. E-mail: [pfrewen@uwo.ca](mailto:pfrewen@uwo.ca)

2011; Stenmark et al., 2013). Although there are multiple factors that predict PTSD symptom severity, it is worthwhile to note that refugee status is potentially one that could be controlled for with faster processing of refugee applications without sacrificing the rigor of detailed security checks (Knipscheer et al., 2015). For example, Nickerson et al. (2011) found that refugees with temporary protection visa who were granted permanent residency demonstrated a decrease in PTSD symptoms and depression, along with an increase in quality of life, suggesting ease of transition into residency status can directly impact psychological symptoms and functioning. The most common fears identified in refugees indeed include being sent back to their country of origin, whereas on the other hand also include being unable to return home in case of emergencies. In other words, the cause of PTSD in asylum seekers and refugees may have begun with the conflict in their native country; however, stress experienced as a result of the process of becoming a refugee and seeking asylum in a foreign country has been shown to evoke further psychological disturbance. As such, in order to fully aid this population and improve their livelihood, care must be taken even before their entry to the host country.

To be diagnosed with PTSD, an individual must have been exposed to a traumatic life event(s), defined within the *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.; American Psychiatric Association, 2013; *DSM-5*) as an event that caused death, threat of death, actual or threatened injury, or actual or threatened sexual violence, events that indeed often befall refugee applicants. Moreover, four symptom clusters must also be present: (a) reexperiencing of such events in the form of intrusive memories, nightmares, or flashbacks or experiencing psychological or physiological distress at reminders of the event; (b) avoidance of reminders of the event; (c) various negative alterations in cognition and mood such as anhedonia, emotional numbing, guilt and/or shame, and (d) hyperarousal, for example, as evidenced by irritability and/or hostility, hypervigilance, startle reactivity, insomnia, and difficulty concentrating. PTSD is often comorbid with several other psychological disorders including major depressive disorder (MDD). For example, Teodorescu et al. (2012) reported that 82% of their refugee sample resettled in Norway had PTSD, of which 26% were Middle Eastern, and 80% of those with PTSD had comorbid disorders, largely MDD. Likewise, Stenmark et al. (2013) reported that 77% of refugees in their study were diagnosed with PTSD, 52% of which were Iraqi, and 33% from remaining Middle Eastern countries. Given such high rates of PTSD, it is important to determine which psychological assessment measures are most valid for use in the diagnosis of PTSD in the Syrian refugee population.

Further, if PTSD is determined to be present, clinicians should respond with provision of evidence-based treatments. There are various types of treatment available for PTSD, the most researched of which include various cognitive-behavioral therapies, such as prolonged exposure therapy (PE), which involves structured repetitive retelling of the traumatic event to promote habituation or extinction of distress associated with the traumatic memory (Foa, 2011; Foa, Rothbaum, Riggs, & Murdock, 1991), cognitive processing therapy (CPT), which generally targets increased comprehension and reconceptualization of traumatic memories to reduce distress (Resick, 2001; Resick & Schnicke, 1992), and eye movement desensitization and reprocessing (EMDR), a form of exposure-based therapy combined with bilateral eye-movements (Shapiro, 1995). Although PE, CPT, and EMDR have been shown

to reduce PTSD symptoms, they generally are structured to target response to a single traumatic event.

Another form of CBT is narrative exposure therapy (NET; Schauer, Neuner, & Elbert, 2005, 2011), which is generally similar to PE but differs in so far as that NET attempts to treat multiple traumatic events within a life trajectory and was developed to be particularly relevant to refugee and torture populations. In particular, NET is a form of exposure therapy that uses the chronicity of testimony therapy (Gwozdziwycz & Mehl-Madrona, 2013), where patients describe their life from birth to the present moment, while describing their traumatic experiences in detail. The therapist sometimes uses a string to signify the patient's lifeline, stones to signify traumatic events, and flowers for positive events and again for future hopes and aspirations. There are three parts in NET, the first part (one to two sessions) comprised a structured interview about the trauma(s), including an events checklist, followed by psychoeducation to inform participants about trauma-related symptoms, to outline the treatment rationale, and to plan the approximate number of sessions required. Part 2 (one session) involves the laying of the lifeline, where the participant uses flowers and stones to symbolize positive and traumatic events, respectively. Last, Part 3 (4 to 12 sessions) involves narrative exposure, which consists of narrating the life story across multiple sessions along the chronology of the lifeline with an emphasis on moments of increased arousal, concentrating on reprocessing the traumatic experiences (Schauer, 2005).

Beyond psychological assessment measures, the use of biomarkers in PTSD assessment and treatment outcomes studies is an emerging field of research. Some researchers have expressed a hope that establishing biomarkers will ultimately provide an objectively verifiable measure of PTSD symptomology (e.g., Pitman et al., 2012). Currently, however, there are rather few biomarkers for PTSD with established sensitivity and specificity for the disorder. Some established biomarkers include the pro-inflammatory cytokines involved in immune function (e.g., Passos et al.'s (2015) meta-analysis showed significantly higher levels of interleukin-6 [IL-6], IL-1 $\beta$ , interferon- $\gamma$  [IFN- $\gamma$ ], and tumor necrosis factor- $\alpha$  [TNF- $\alpha$ ]). In addition, grey matter volume and altered brain response has been documented (e.g., Kühn and Gallinat's (2013) meta-analysis found that the left hippocampus, anterior cingulate cortex, and bilateral insular cortex were smaller in traumatized persons, whereas response in the ventral medial prefrontal cortex was suppressed, which could be the cause of impaired fear regulation and poor concentration). Moreover, neuro-electrophysiological abnormalities with foci in the temporal lobes have been observed (e.g., Lobo et al.'s [2015] systematic review found that P2 and P50 were positively correlated with PTSD symptoms severity, whereas P3, N1, and N150 were negatively correlated with PTSD symptoms severity). Increased resting heart rate (HR) and a variety of other measures of general psychophysiological arousal (e.g., muscle tension, skin conductance levels) have also been observed (e.g., review by Pole, 2007). Finally, both hyper- and hypocortisolemia have been described in PTSD populations (e.g., Pitman et al.'s, 2012, review indicated that lower plasma cortisol levels may have a role in the pathogenesis of PTSD). It remains to be determined, however, if such biomarkers are constant through cultural barriers.

In the present article, we describe the results of a systematic review of psychological assessment, psychological treatment, and biomarker research of PTSD in Iraqi, Kurdish, and Syrian refugees published since 2011 in order to select research articles relevant to the current Syrian conflict. The objective of our review was to

determine an evidence-base for informed recommendations on culturally sensitive psychological services to be provided to such populations in Canada. This will be accomplished by establishing a list of evidence-based assessment measures, treatments, and biomarkers that were used in recent literature.

## Method

The first author conducted all data extraction in reference to the PRISMA-P checklist (Shamseer et al., 2015) and evaluated study quality in reference to the 11-item Physiotherapy Evidence Database-PsycBITE (PEDro-P; Maher, Sherrington, Herbert, Moseley, & Elkins, 2003; Murray et al., 2013; Tate et al., 2004), as supervised by the second author. The PEDro-P rates study quality on a 1 to 10 scale where increasing scores reflect higher quality, each item contributing one point (except for item 1). The literature search was completed through five medical, psychological, and sociological bibliographic databases (Cochrane library, EMBASE, PsycINFO, PubMed, and Web of Science) to identify, within a specified refugee population, research articles describing rates of PTSD, psychological assessment instruments used to diagnose PTSD, psychological interventions used to treat PTSD, and potential biomarkers for PTSD. First, a scoping review was conducted to determine if there would be sufficient literature for a systematic review on the topic using only Syrian refugee populations, which was determined not to be the case. As such, due to the geographical proximity, relatively similar cultural milieu and extent of conflict, Iraqi and Kurdish refugees were also included in the participant inclusion criteria.

The inclusion criteria for the systematic review were the following: (a) research conveyed data on PTSD as per the criteria set out in the *DSM-IV* or *DSM-5*, with the use of formal psychological assessment measures, psychological treatments, or biomarkers, coded as topic; (b) the research reported on Syrian, Iraqi, or Kurdish refugees who were residing in a developed country at the time the research was conducted (Australia, North America, and Western Europe, including Scandinavian countries), coded as participant; (c) the article was written in English, coded as language; (d) the article was a primary research article, systematic review, meta-analysis, or literature review, coded as study type; and (e) the article was written after 2011, so as to select research articles relevant to the current Syrian conflict, coded as date (see Figure 1).<sup>1</sup>

The key words used described the participants (population), the event (trauma), and the outcome of interest (PTSD); search terms were kept general in order to generate as many potential articles of interest as possible. The searched words were as follows: *post-traumatic stress disorder* and *refugee*, the limits activated were human participants only, article available in English only, and only articles dating from January 2011 to the day the search was conducted (March 22, 2016). After the initial keyword search, 670 articles from the databases were exported to Eppi-Reviewer 4 software for further analysis. In Eppi-Reviewer 4, there were three levels of screening. The first level, which was automated by the software, removed duplicate citations; 187 duplicates were removed as such. The second level of screening was therefore undertaken with the remaining 483 titles and abstracts (see Figure 1) during which, applying the inclusion and exclusion criteria, article titles and abstracts were read in order to judge the relevance

of each manuscript to the current systematic review. After screening the titles and abstracts, 137 papers were chosen for full text screening, but 120 were excluded upon implementation of the inclusion and exclusion criteria (see Figure 1). Most of the studies in the full text screening did not meet the inclusion criteria for participant composition, others were letters or commentary articles about an article, some did not address PTSD in refugee samples, some were not written in English. After the screenings, 17 studies were therefore included in the full review.

Data extraction was conducted in the form of demographics, coded methodology (assessment, treatment, biomarkers), and study outcomes. Specific assessment instruments will be described in cases where they were included in a minimum two or more studies, though all treatments provided will be described.

## Results

The 17 articles that were included in the present systematic review explored a wide range of concerns when it comes to providing psychological aid to Syrian, Iraqi, or Kurdish refugees, a culturally sensitive population. See Table 1 for a listing and summary of the included studies; additional study details are included in supplementary materials. PEDro-P scores ranged from 2 to 7 ( $M = 2.94$ ,  $SD = 1.64$ ). PEDro-P scores are artificially low in most assessment-focused and biomarker studies because these studies are only descriptive in nature rather than being treatment trials, therefore rendering several PEDro-P ratings not applicable; by contrast, both articles reporting on the effectiveness of NET scored moderate to high quality. Table 2 reports the assessed levels of study quality. We did not find that study results varied in any systematic way by study quality.

## Assessment Measures

Seven assessment measures were used more than once, specifically The Vivo Checklist Of War, Detention And Torture (Schauer et al., 2005, 2011); Clinician-Administered PTSD Scale (Blake et al., 1995); Mini-International Neuropsychiatry Interview (Leclercq et al., 1997); Hamilton Depression Rating Scale (HAM-D; Hamilton, 1960); Harvard Trauma Questionnaire (HTQ; Shoeb et al., 2007); Hopkins Symptom Checklist-25 (HCL-25; Ventevogel et al., 2007); and the Post Migrational Living Difficulties Questionnaire (PMLD; Silove et al., 1997).

## Clinically Administered

The Vivo Checklist of War, Detention And Torture was used in three studies with a cumulative sample size of 133 (all of whom study inclusion criteria as refugees from the Middle East, that is, Iraqi (including Mandaean), Kurdish, and Syrian refugees). It is a measure of the traumatic experiences that an individual may experience in a war torn country, in the form of a 45-item checklist.

The Clinically Administered PTSD Scale (CAPS) was used in seven studies with a cumulative sample size of 769 (95% of whom met study inclusion criteria). As a diagnostic measure of PTSD symptom severity, 30-items in the CAPS evaluate PTSD symptom

<sup>1</sup> For studies with multiple populations, at least 50% of the total population must have been Syrian, Iraqi, or Kurdish refugees.

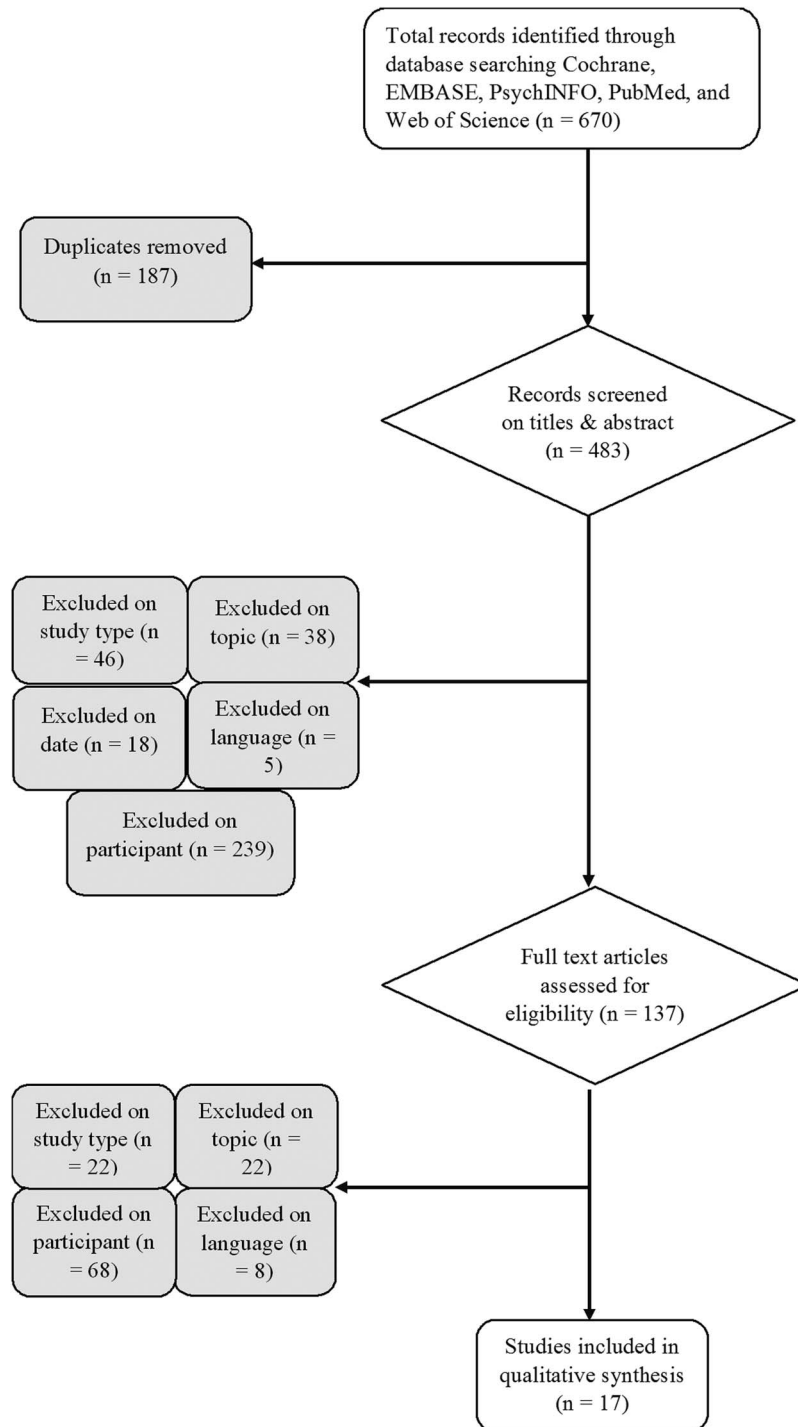


Figure 1. Results of systematic review of psychological assessment, psychological treatment, and biomarker research of PTSD in Iraqi, Kurdish, and Syrian refugees published since 2011.

frequency and severity (reexperiencing, avoidance, hyperarousal), as well as duration of symptoms and associated features (survivor's guilt, depersonalization, derealization), over interviews that generally last 40–60 min (Blake et al., 1995). The CAPS has also been used to diagnose PTSD in various ethnicities such

as Cambodian and Bosnian, and displayed good reliability and validity in each population (Hinton et al., 2006; Charney & Keane, 2007).

The Mini-International Neuropsychiatric Interview was used in seven studies with a cumulative sample size of 258 (87% of whom

Table 1  
Summary of the 17 Studies Included in the Systematic Review

Studies Included in the Systematic Review				
Study	Title	N	Participants	Results
<b>Assessment</b>				
Johnsen et al. (2011)	<i>Patients with Posttraumatic Stress Disorder Show Decreased Cognitive Control: Evidence from Dichotic Listening</i>	45	Mixed background, with the majority from Middle East ( $n = 25$ ).	The posttraumatic stress disorder (PTSD) groups demonstrated right ear advantage (REA) during dichotic listening at all times whereas the control group were able to shift between REA and left ear advantage, as expected.
Knipscheer et al. (2011)	<i>Trauma Exposure and Refugee Status as Predictors of Mental Health Outcomes in Treatment-Seeking Refugees</i>	688	Mixed background with 399 from the Middle East	PTSD symptom severity and depression was predicted by absence of refugee status and collective traumatic events.
Nickerson et al. (2011)	<i>Change in Visa Status Amongst Mandaean Refugees: Relationship to Psychological Symptoms and Living Difficulties</i>	101	Mandaean refugees	Refugee status from temporary protection visa to permanent residency was associated with significant decrease in PTSD and depression symptoms and an increase in quality of life.
Nickerson et al. (2014)	<i>Posttraumatic Stress Disorder and Prolonged Grief in Refugees Exposed to Trauma and Loss</i>	248	Mandaean refugees	Divergent PTSD and prolonged grief disorder symptom profiles in trauma exposed populations.
Opaas et al. (2015)	<i>Relationships of Childhood Adverse Experiences With Mental Health and Quality of Life at Treatment Start for Adult Refugees Traumatized by Pre Flight Experiences of War and Human Rights Violations</i>	54	Mixed background, more than half Iraqi ( $n = 30$ )	High frequency of adverse childhood and potentially traumatic events in adult refugees along with exposure to war and human rights violations significantly related to total symptoms of PTSD.
Pfortmueller et al. (2016)	<i>Adult Asylum Seekers from the Middle East Including Syria in Central Europe: What Are Their Health Care Problems?</i>	880	Mixed background, Syrian ( $n = 222$ ) and Iraqi ( $n = 369$ ).	The majority of patients presented themselves at the clinic for surgery or other medical reasons. Only 15% went for psychiatric reasons. Psychiatric comorbidity was elevated, the most common diagnoses were psychosocial crisis, depression, and PTSD.
Riber (2016)	<i>Attachment Organization in Arabic Speaking Refugees with Post Traumatic Stress Disorder</i>	43	Mixed background ( $n = 26$ Iraqi)	There was low secure-autonomous attachment and high unresolved-disorganized attachment in this refugee sample.
Slewa-Younan et al. (2014a)	<i>Mental Health Literacy of Resettled Iraqi refugees in Australia: Knowledge About Posttraumatic Stress Disorder and Beliefs about Helpfulness of Interventions</i>	225	Iraqi refugees	Only 14% of participants correctly identified PTSD in a vignette. Participants found the following treatments to be most helpful in decreasing order: seeing a psychiatrist, reading the Koran or Bible, having a family member intervene, and seeing a psychologist.
Slewa-Younan et al. (2015)	<i>A Systematic Review of Post-Traumatic Stress Disorder and Depression Amongst Iraqi Refugees Located in Western Countries</i>		Not specified. Inclusion criteria was for Iraqi refugees living in a Western country.	There was high variability in PTSD prevalence (8%–37%) and depression (28%–75%).
Eckart et al. (2011)	<i>Structural Alterations in Lateral Prefrontal, Parietal and Posterior Midline Regions of Men With Chronic Posttraumatic Stress Disorder</i>	52	Mixed background, 48 Kurdish participants. Control group ( $n = 13$ ); trauma control ( $n = 19$ ); and PTSD group ( $n = 20$ ).	The PTSD group showed a decrease in brain volume within lateral prefrontal regions, right inferior parietal cortex, and bilateral isthmus of the cingulate. Findings correlated with extent of traumatization.

(table continues)

Table 1 (continued)

Studies Included in the Systematic Review				
Study	Title	N	Participants	Results
<b>Biomarker</b>				
Eckart et al. (2012)	<i>Magnetic resonance volumetry and spectroscopy of hippocampus and insula in relation to severe exposure of traumatic stress</i>	52	Same as Eckart et al. (2011) study with the exclusion of 5 participants for not completing the magnetic resonance imaging scan	There was no significant difference in hippocampal or insula volumes as well as NAA <sup>a</sup> concentrations. The PTSD group performed worse on memory tests compared with the control group.
Gjini et al. (2013)	<i>Evoked Potential Correlates of Posttraumatic Stress Disorder in Refugees With History of Exposure to Torture</i>	60	60 Iraqi refugee's split evenly between control, trauma exposed without PTSD, and PTSD groups.	There was a decrease in P50 S1 <sup>b</sup> amplitude for PTSD and trauma-exposed no PTSD groups compared to control. Similarly, there was a decrease in P50 gating for the PTSD group only. There was an increase in N75 S1 <sup>c</sup> amplitude and gating for the PTSD group compared with control only. Finally, N150 S2 <sup>d</sup> amplitude increased in trauma-exposed participants without PTSD compared with the other two groups.
Gola et al. (2012)	<i>Victims of Rape Show Increased Cortisol Responses to Trauma Reminders: A Study in Individuals With War- and Torture-Related PTSD</i>	58	Mixed background with 21 Middle Eastern participants. Three groups: control ( <i>n</i> = 28); raped ( <i>n</i> = 10); and non-raped ( <i>n</i> = 20).	There was a decrease in salivary cortisol levels in the PTSD non-raped group, whereas the opposite was found for the PTSD raped group. As well, there was a decrease in plasma cortisol in all groups, and this increase was amplified if depressed. Finally, PTSD increased total plasma cortisol concentration compared to non PTSD.
Slewa-Younan et al. (2012)	<i>Measures of Psychophysiological Arousal Among Resettled Traumatized Iraqi Refugees Seeking Psychological Treatment</i>	25	All were resettled Iraqi refugees	There was an increase in resting heartrate, but no significant difference in heartrate variability.
Slewa-Younan et al. (2014b)	<i>Trauma in Resettled Iraqi Refugees: Difference Between Those Seeking Psychological Treatment and Those Not Seeking Psychological Treatment</i>	25	All were resettled Iraqi refugees	There were significant differences in PTSD symptom score. The treatment seeking group demonstrated increased PTSD and depressive symptoms compared to the non-treatment seeking group. The PTSD groups also had higher resting heartrate compared with the control group, but differences were not significant between the treatment seeking and non-treatment seeking group.
<b>Treatment</b>				
Adenauer et al. (2011)	<i>Narrative Exposure Therapy for PTSD Increases Top-Down Processing of Aversive Stimuli Evidence From a Randomized Controlled Treatment Trial</i>	34	NET group ( <i>n</i> = 16) and waitlist control (WLC) group ( <i>n</i> = 18). Groups consisted of mixed demographics, mainly Middle Eastern (NET <i>n</i> = 8; WLC <i>n</i> = 11).	NET decreased CAPS and HAM-D scores compared with the WLC group. Four months later 45.5% of the NET group no longer met the criteria for PTSD.
Hijazi et al. (2014)	<i>Brief Narrative Exposure Therapy for Posttraumatic Stress in Iraqi Refugees: A Preliminary Randomized Clinical Trial</i>	63	All participants were Iraqi refugees.	There was a significant treatment effect at 2 and 4 months. NET increased well-being, and decreased PTSD and depression symptoms after 2 months. By 4 months, 47.2% of the NET group reported that their symptoms had improved. Last, NET improved posttraumatic growth, indicating potential recovery from trauma.

Note. NET = narrative exposure therapy; CAPS = Clinically Administered PTSD Scale; HAM-D = Hamilton Depression Rating Scale.

<sup>a</sup> N-acetyl-aspartate (type of brain metabolite). <sup>b</sup> Positive deflection with a latency of 50 ms (P50); paired-click paradigm consists of two identical clicks, S1 being the first click. <sup>c</sup> Negative deflection peaking at about 75 ms (N75). <sup>d</sup> Negative deflection peaking at about 150 ms (N150); S2 is the second click in the paired-click paradigm.

Table 2  
 PEDro-P Rating Scale and Scores for Respective Articles Included in the Systematic Review (Item 1 Not Scored)

PEDro-P Scale	Adenauer et al. (2011)	Eckart et al. (2011)	Eckart et al. (2012)	Gjini et al. (2013)	Gola et al. (2012)	Hijazi et al. (2014)	Johnsen et al. (2011)	Knipscheer et al. (2011)	Nickerson et al. (2011)	Nickerson et al. (2014)	Opaas et al. (2015)	Pfortmüller et al. (2016)	Riber et al. (2016)	Slewa-Younan et al. (2012)	Slewa-Younan et al. (2014a)	Slewa-Younan et al. (2014b)	Slewa-Younan et al. (2015)
1. Eligibility criteria were specified <sup>a</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Subjects were randomly allocated to groups	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
3. Allocation was concealed	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
4. Groups were similar at baseline	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
5. "Blinding" of all participants	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
6. "Blinding" of all therapist	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
7. "Blinding" of all assessors	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0
8. Appropriate monitoring	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9. Intention to treat analysis	1	0	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0
10. Intergroup comparisons	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11. Point measures and measure of variability	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0
Total score	5/10	2/10	2/10	3/10	2/10	7/10	2/10	2/10	2/10	3/10	4/10	2/10	6/10	3/10	2/10	2/10	1/10

<sup>a</sup> External validity (Items 2–11 measure internal validity). PEDro-P = Physiotherapy Evidence Database-PsycBITE.

met study inclusion criteria). It is used to assess psychological symptoms associated with various psychiatric disorders outlined in the ICD-10 and *DSM-IV*. It uses between 10 and 20 items that assess general disorders (MDD, anxiety disorders) and takes about 15 to 25 min to administer and has also displayed good reliability and validity (Lecrubier et al., 1997).

Finally, the HAM-D assesses depressive symptoms and was used in two studies with a cumulative sample size of 64 (86% of whom met study inclusion criteria). The HAM-D assessment spans 15 to 20 min and has 21-items although only the first 17-items are typically scored. A score of 0 to 7 is classified as normal, 8 to 13 indicates mild depression, 14 to 18 indicates moderate depression, 19 to 22 indicates severe depression, and greater or equal to 23 indicates very severe depression (Hamilton, 1960). The HAM-D has also displayed acceptable psychometric properties (Bachner, 2016).

### Self-Report

The HTQ was used in 10 studies with a cumulative sample size of 1,472 (94% of whom met study inclusion criteria). This self-report assessment is used to inquire about various traumatic events that could be experienced in a lifetime. The first of four parts of the HTQ consists of 17-items about the trauma events followed by an open-ended questionnaire on brain injury in Part 2. Subsequently, the third part of the questionnaire gathers personal information from the patient before Part 4, where 16-items about culturally specific trauma-related symptoms and an additional 14 items, largely specific to refugees, are assessed. The HTQ has displayed good psychometric properties (Shoeb et al., 2007).

The HSCL-25 assesses depression and anxiety symptoms and was used in six studies with a cumulative sample size of 1,779 (82% of whom met study inclusion criteria), although it should be noted that one of the six studies used the HSCL-15, which is specific to the assessment of depression. The HSCL-25 has 10-items on anxiety symptoms and 15-items on depressive symptoms, which are scored from 1 (*not at all*) to 4 (*extremely*; Ventevogel et al., 2007).

Finally, the PMLD was used in two studies with a cumulative sample size of 349 (100% of whom met study inclusion criteria) and assessed levels of stress due to post migration stressors. It is a 19-item checklist, and each item is rated on a 5-point scale from 0 (*not a problem*) to 4 (*a very serious problem*; Silove et al., 1997).

### Treatment Types

The only treatment type used in more than one study reviewed was NET, which was used in only two studies (Adenauer et al., 2011; Hijazi et al., 2014). In comparison with NET, Slewa-Younan et al. (2014a) also surveyed responses to nonsystematic treatments where recruited resettled Iraqi refugees ( $n = 225$ ) were asked to complete a survey. Specifically, participants were presented a vignette about a fictional Iraqi refugee who had been exposed to trauma and then asked what the fictional character's main problems were. Responses showed that 41.8% indicated fear was the problem, 19.6% indicated depression was the problem, whereas only 14.2% labeled the fictional character's problem as PTSD. Participants were then asked what type of treatment they perceived to be most helpful for the problem which, in decreasing order of

perceived helpfulness, were seeing a psychiatrist (35.4%), reading the Koran or Bible (19.0%), having a family member intervene (11.5%), and seeing a psychologist (8.4%). The authors indicated that 31.1% of the participants met the criteria for PTSD symptomology according to the HTQ.

Of the two studies that examined NET, Adenauer et al. (2011) evaluated its effectiveness as compared to a waitlist control (WLC) group. The NET group met with their therapist for 12 sessions averaging 108 min per session. The symptoms of PTSD and depression, measured by CAPS and HAM-D, were significantly reduced in the NET group ( $d' = 2.21$  for CAPS,  $d' = 1.56$  for HAM-D) and increased in the WLC group ( $d' = -0.97$  for CAPS, and  $d' = -0.07$  for HAM-D), as assessed at 4 months posttreatment. Moreover, 45.5% of the NET group no longer met the criteria for PTSD following treatment, whereas all of those in the WLC group continued to meet the criteria for PTSD. Similarly, Hijazi et al. (2014) compared a NET group with a WLC group, but only a brief NET was used, comprising only three 60- to 90-min sessions. Follow-up assessments were conducted at 2 months and 4 months, where for the NET group trauma symptoms measured by the HTQ decreased at 2 months ( $d' = -0.39$ ) and 4 months ( $d' = -0.50$ ), as did depressive symptoms measured by the Beck Depression Inventory at 2 months ( $d' = -0.62$ ) and 4 months ( $d' = -0.84$ ). However, the WLC group also displayed a decrease in PTSD and depression symptoms by 4 months ( $d' = -0.26$ ,  $d' = -0.53$ , respectively). Thus, NET treatment was found to reduce PTSD symptom severity as well as depression symptom severity when administered both in full (12 sessions) as well as when administered briefly (three sessions) over the course of 2 and 4 months compared with the WLC group. No other treatments were used in the remaining 15 manuscripts that were included for the present systematic review.

## Biomarkers

**MRI.** MRI was used to measure brain volume, where Eckart et al. (2011) found a decrease within lateral prefrontal regions, right inferior parietal cortex, and bilateral isthmus of the cingulate. The authors indicated that lower volumes of the lateral prefrontal regions may be associated with an inability to down-regulate negative emotional responses. The authors also discussed the role of the parietal cortices and posterior midline structures in episodic memory. Furthermore, Eckart et al. (2012) found that there was no significant difference in hippocampal volume between their control, trauma-exposed non-PTSD, and trauma-exposed PTSD groups.

**Electroencephalography (EEG).** Stimulus encoding and sensory gating are thought to be correlated with intrusive thoughts and hyperarousal, respectively. Sensory gating is the filtering mechanism that protects higher cortical centers from being flooded by irrelevant sensory information (Gjini et al., 2013). EEG was used to measure evoked potentials, where a decrease in P50 S1 amplitude was found for both PTSD participants and trauma-exposed participants without PTSD when compared with a non-trauma exposed control group, effects that were correlated with dissociation subscores. Similarly, there was a decrease in P50 gating for the PTSD group only and a decrease in N75 S1 amplitude and gating for the PTSD group compared with the control group. As a result, the possibility that gating deficits are correlated

with depression and not PTSD was considered. Finally, N150 S2 amplitude increased in trauma-exposed persons without PTSD when compared with participants with PTSD and non-trauma-exposed healthy controls.

**Cortisol.** Cortisol was measured on the basis of trauma type (rape, other traumas), whereby a decrease in salivary cortisol levels in a PTSD non-rape group was observed, whereas the opposite was found for a PTSD rape group (Gola et al., 2012). As well, over the course of the interview, cortisol levels decreased in the non-rape group, whereas the reverse occurred in the rape group. Lastly, PTSD group status was associated with increased total plasma cortisol concentration. Gola et al. (2012) state that the difference in cortisol levels between rape and other traumas may somehow relate to differential effects for physical proximity of the perpetrator between trauma type, which may modulate peritraumatic responses as well as a latent response to traumatic reminders.

**Heartrate (HR).** An increase in resting HR was found in a PTSD group when compared with controls (Slewa-Younan et al., 2012). However, there were no significant differences in HR between those with PTSD versus other disorders. Interestingly, HR variability was not significantly different between controls and the PTSD group. Slewa-Younan et al. (2012) stated that although HR may not be a specific indicator of PTSD, it can be used as a strategy to target anxiety and stress levels in treatment for this population.

## Discussion

The present research involved a systematic review of psychological assessment measures, psychological treatments, and biomarker research relating to PTSD in Iraqi, Kurdish, and Syrian refugees. Seventeen research articles were identified, the summary of which serves to begin to describe emerging, recent literature bearing on the evidence-based culturally sensitive care of such populations. Overall, study quality was judged to provide an adequate basis for the following recommendations.

## Assessment

The findings from this systematic review support the use of clinically administered diagnostic interviews to assess trauma exposure (The Vivo Checklist of War, Detention, and Torture), PTSD diagnosis and severity (CAPS), and related psychological symptoms and disorders (e.g., the Mini International Neuropsychiatric Interview and the HAM-D) in Iraqi, Kurdish, and Syrian refugees. Along with the clinically administered interviews, the following self-report measures also appeared to demonstrate clinical utility for the population in question: HTQ, HSCL-25, and the Post Migration Living Difficulties Questionnaire. We would recommend that the psychologist assessing Iraqi, Kurdish, and Syrian refugees for PTSD status begin by administering a self-report measure of PTSD symptoms such as the HTQ; in the presence of a high symptom endorsement, the clinician may follow-up with a diagnostic interview such as the CAPS. It must be noted, however, that no studies have yet administered the most recent version of the CAPS referring to *DSM-5* symptoms, that is, the CAPS-5, in such populations; the adequacy of the *DSM-5* nosology of PTSD for representing the disorder in the Iraqi, Kurdish, and Syrian refugee population therefore awaits clarification in future studies. It is



further important to note that assessors may require psychologically educated translators be present to afford the valid conduct of diagnostic interviews.

Although clinically administered interviews are generally preferred over self-report measures as a means of arriving at accurate categorical diagnosis and definitive measures of symptom severity, the use of these measures requires a trained professional health provider to administer it. With the increasing numbers of refugees presenting to Canadian health services, the feasibility and cost-effectiveness of the conduct of such clinical interviewing may sometimes be in question; some have advocated their use be reserved primarily for research more so than in standard clinical practice (Silove et al., 2007). By contrast, the use of self-report measures are convenient, cost-effective, and as observed in this systematic review, generally display good clinical utility for the target population. This is especially true in the case of the HTQ, which has been translated into Arabic and used to assess mental health disorders in Iraqi refugees. Silove et al. (2007) compared psychometric properties of the HSCL-D (15 items on depression) and HTQ against the structural clinical interview for *DSM-IV* (SCID) and found that the three measures had greater agreement identifying noncases than cases. Silove et al. (2007) therefore suggest the best approach to use of both clinically administered assessments and self-report measures was to administer the self-report assessments first to exclude noncases, followed by the structured diagnostic interview to confirm diagnosis in those who have already scored high on the self-report questionnaire. On the basis of the findings of this systematic review, we would accordingly suggest the HTQ be used first to exclude noncases for PTSD and related psychiatric disorders, the HSCL-25 be used to exclude noncases for anxiety and depressive disorders, and the PMLD questionnaire be used to identify the severity of stressor exposure following migration. In cases of apparent clinically significant symptom and problem endorsement, the CAPS may then be used to confirm PTSD diagnosis, whereas the HAM-D or a similar instrument may be administered to assess for diagnosis of comorbid depression.

## Treatment

NET (Schauer et al., 2005, 2011), a widely used therapy for PTSD, was shown to be an effective intervention for PTSD in the Iraqi, Kurdish, and Syrian refugee population in two studies (Adenauer et al., 2011; Hijazi et al., 2014). No other systematic treatment was used, although participants in one study reported that seeing a psychiatrist, reading the Koran or Bible, family intervention, and seeing a psychologist were also perceived to be helpful interventions by refugees (Slewa-Younan, 2014a). NET was designed as a short-term treatment for traumatic stress disorders specific to refugees and asylum seekers, individuals with potential exposure to multiple traumatic events (Robjant & Fazel, 2010). As noted, other forms of exposure therapy, for example, PE, have also been administered in numerous trials, although none were identified in the present review of recent studies among Iraqi, Kurdish, and Syrian refugees. Although there have not been any studies directly comparing outcomes between NET and PE, Mørkved et al. (2014) compared NET

and PE by reviewing treatment manuals and clinical trials and found the two treatments to be similar in that they are both essentially exposure-based therapies founded on relatively similar psychological theory. What distinguishes the two treatments, however, is the use of the lifeline in NET: The lifeline allows the therapist to attend in an organized, integrative manner to the often multiple and complex trauma exposures present in refugees across their life span, whereas PE tends to focus on the effects of a single traumatic life event. In addition, in testimonial to the cross cultural validity and sensitivity of NET, in most studies it has been used in non-Western regions (93.33%), whereas PE has seldom been used in non-Western regions (6.67%; Mørkved et al., 2014). Thus, consistent with the findings from this systematic review, NET may be the evidence-based psychological treatment of choice for Iraqi, Kurdish, and Syrian refugees and asylum seekers presenting to Canada.

A limitation of the two NET studies identified in the systematic review, however, is that they only compared NET with the WLC group, rather than an active control condition. Stronger designs would be more advantageous, such as comparing NET to other established psychological interventions. For example, Stenmark et al. (2013) compared the effectiveness of NET to treatment as usual (TAU; i.e., treatments that would typically be used, except for those specific to NET), the latter of which consisted only in the provision of help with sleep problems, depressive symptoms, issues with asylum status and other everyday difficulties. The authors found that the NET group (29% Iraqi, 16% other Middle Eastern country) reported a greater symptom reduction compared to the TAU group (23% Iraqi, 17% other Middle Eastern country), specifically, for PTSD symptoms as assessed by the CAPS ( $g = 1.37$  at 1 month, and  $g = 1.53$  at 6 months), and for depression symptoms as assessed by the HAM-D ( $g = 0.89$  at 1 month, and  $g = 1.07$  at 6 months). As well, at 6 months post treatment 45.5% of the NET group no longer met the criteria for PTSD compared to 19% of the TAU group. Similarly, Hensel-Dittman et al. (2011) compared stress inoculation training (SIT; instruction in breathing techniques, relaxation training, thought stopping, guided self-dialog) and NET (both groups were mainly asylum seekers from unspecified countries) and found that NET decreased PTSD symptoms at 4 weeks (18%<sup>2</sup>) and 1-year post test (37%<sup>2</sup>), whereas SIT decreased PTSD symptoms only at 6 months (20%<sup>2</sup>). Thus, research external to this systematic review does tend to establish NET as an effective treatment in comparison with certain other typical interventions for PTSD. However, there remains a need to establish which specific treatments can be expected to be most effective for different cultural groups including the Syrian refugee population.

## Biomarkers

The use of biomarkers may ultimately improve the accuracy of PTSD diagnosis, among other psychiatric disorders (e.g., Pitman et al., 2012). Mainly due to the stigma often surrounding the presence of mental disorders, particularly in non-Westernized cultures, seeking help from a psychiatrist or psychologist may not be the first thing Iraqi, Kurdish, and Syrian

<sup>2</sup> No longer met the criteria for PTSD.

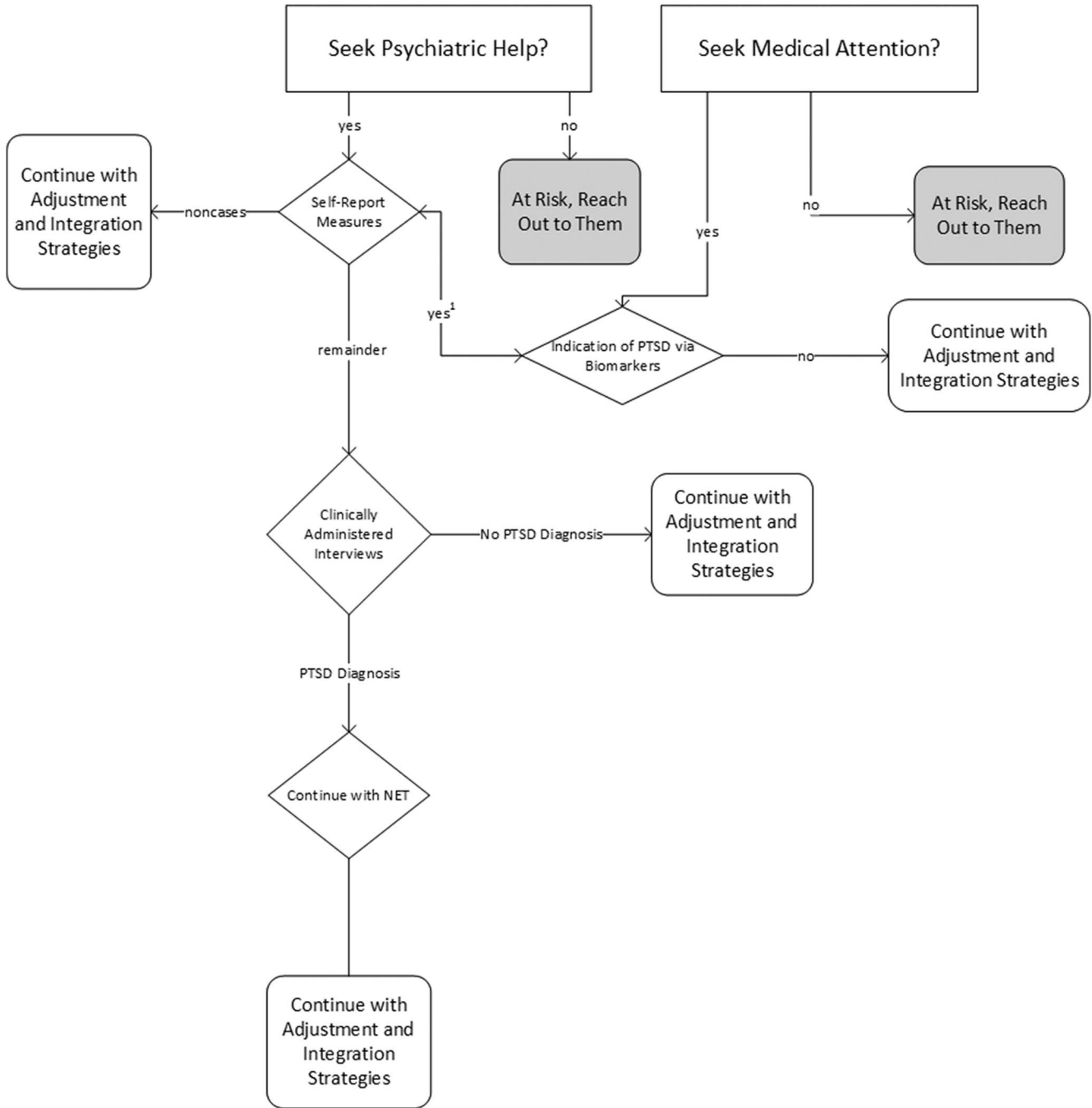


Figure 2. Possible course of action for psychological services, whether persons present first for mental health treatment or physical health care. <sup>1</sup> The bidirectional relationship between biomarkers and self-report measures indicate that regardless of biomarkers or self-report cases, prior to clinically administered interviews biomarkers should be assessed for research purposes.

refugees suffering from mental health disorders will think of doing. In comparison, such people may be more likely to present at hospital for medically based treatment, for example, following presentation of physically based symptoms. Indeed, Pfortmueller et al. (2016) found that 43.4% of refugees went to the emergency department for surgical reasons, 36.5% for med-

ical reasons, 15.6% for psychiatric reasons and 4.5% for other reasons (gynecology, dermatology, etc.). As such, assessment of biomarkers for PTSD by medical staff may not be an unexpected practice and may afford biomedical assessment of correlates of potential trauma-related psychological disturbance present in an individual (Pfortmueller et al., 2016).

However, extant literature suggests that most current candidate biomarkers for PTSD demonstrate insufficient reliability, sensitivity, or specificity to be of much aid to diagnosis or treatment. A simple though clearly nonspecific measure to acquire of PTSD relevance is HR, however, elevated resting HR can be indicative of many disorders, and normal or even low HR is not a contraindication to PTSD diagnosis, but rather may even be a sign of a hypo-aroused, emotionally numb or dissociative phenotype (e.g., Lanius et al., 2010). Further, whereas the use of MRI scans measuring brain atrophy may be of specific use in the diagnosis of PTSD associated with traumatic brain injury, neuroimaging is not commonly administered in standard psychiatric care, and the utility of neuroimaging cannot be currently justified relative to its expense. While the use of EEG is less expensive, a biomarker for PTSD on the EEG is likewise not currently established, even if abnormalities of the temporal lobe have been observed in certain samples as can certain general indicators of CNS arousal (e.g., alpha [8–12 Hz] amplitude at rest). Blood or salivary samples could also be acquired to measure cortisol level as a general indicator of the stress state of the neuroendocrine system, although again the presence of such indicators are not necessarily diagnostic of PTSD, whereas their absence neither refutes the presence of the disorder. At present, it may be argued that assessment of biomarkers may in some cases provide complimentary support of psychological test findings, but cannot be presently encouraged as standard care. Nevertheless, we advocate for continued biomarker research in Iraqi, Kurdish, and Syrian refugees.

### Conclusion

We conclude that to effectively aid the incoming Syrian refugees to Canada, it is necessary that adequate evidence-based psychological assistance be available. Figure 2 suggests a possible course of action for psychological services, whether persons present first for mental health treatment or physical health care. The use of structured clinical interviews like the CAPS following administration of self-report measures like the HTQ, HSCL-25, and PMLD will assist in the accurate identification of PTSD cases as well as those for related disorders such as MDD in Syrian refugees in a time efficient manner. Particularly, in the presence of PTSD diagnosis, NET appears to be among the most effective psychological therapies available for the treatment of PTSD in refugees. Continued investigation of biomarkers may also ultimately assist in the development of etiologic and treatment approaches that are dually informed by psychological and medical models of trauma-related disorders and trauma recovery.

Moreover, despite our focus herein on diagnostic measures, it is the authors' shared opinion that provision of psychological services should not be contingent on PTSD diagnosis or the presence of related psychiatric disorders (e.g., depression). Rather, providing support for all help-seeking refugees, including those presenting only with subthreshold symptoms may assist persons in coping with adjustment to Canada, with potential troubles integrating into their new community and coping with anticipated sociocultural change. We Canadians are currently tasked not only with providing Syrian refugees with basic humanitarian needs such as safe environment, shelter and food, but also with

much needed evidence-based and trauma-informed support for their mental health and psychological adjustment to this great country.

### Résumé

Nous avons effectué un examen systématique de la littérature faisant état de la prévalence des mesures d'évaluation, des traitements et des biomarqueurs utilisés dans le diagnostic et le traitement du syndrome de stress post-traumatique (SSPT) chez les réfugiés irakiens, kurdes et syriens. Pour ce faire, nous avons effectué une recherche dans les bases de données médicales, psychologiques et sociologiques de pièces de littérature pertinentes publiées entre janvier 2011 et mars 2016. Au total, dix-sept manuscrits ont satisfait aux critères d'inclusion. Sept mesures d'évaluation ont été employées dans plus d'une étude, dont quatre ont été administrées cliniquement (liste de contrôle en vivo de guerre, de détention et de torture; échelle de SSPT administrée cliniquement (CAPS); mini-entrevue neuropsychiatrique internationale; échelle de dépression de Hamilton), et dont trois constituaient des mesures d'autodéclaration (questionnaire sur les traumatismes de Harvard (HTQ), liste de contrôle des 25 symptômes de Hopkins (HSCL-25); difficultés d'adaptation aux nouvelles conditions de vie post-migration (PMLD)). Deux études ont été relevées en matière de traitement psychologique, les deux ayant administré la thérapie par exposition aux narratifs; aucun autre traitement psychologique systématique n'a été identifié. Différents biomarqueurs ont été étudiés, mais chacun d'eux dans une seule étude, incluant l'imagerie par résonance magnétique (IRM) de régions préfrontales latérales, du cortex pariétal inférieur droit, de l'isthme bilatéral du corps calleux, de potentiels liés à des événements d'EEG, d'hypercortisolémie et de rythme cardiaque élevé. Sur la base de ces constats, nous recommandons que toute utilisation des méthodes HTQ, HSCL-25, et PMLD au lieu de PTSD exclue les non-cas de SSPT et la CAPS pour le diagnostic de SSPT chez les réfugiés irakiens, kurdes et syriens du Canada. Nous recommandons en outre que la thérapie par exposition aux narratifs soit le mode de traitement privilégié étant donné qu'il est le plus probant dans cette population. Enfin, nous préconisons la poursuite des recherches au niveau des biomarqueurs en tant que moyen pour améliorer et objectiver le traitement et l'évaluation psychologique du SSPT chez les réfugiés canadiens.

*Mots-clés* : syndrome de stress post-traumatique (SSPT), réfugiés, évaluation psychologique.

### References

References marked with an asterisk indicate studies included in the systematic review.

- \*Adenauer, H., Catani, C., Gola, H., Keil, J., Ruf, M., Schauer, M., & Neuner, F. (2011). Narrative exposure therapy for PTSD increases top-down processing of aversive stimuli—Evidence from a randomized controlled treatment trial. *BMC Neuroscience*, 12, 127.
- American Psychiatric Association. (2013). *Cautionary statement for forensic use of DSM-5*. Retrieved from <http://dx.doi.org/10.1176/appi.books.9780890425596.CautionaryStatement>
- Bachner, Y. G. (2016). Psychometric properties of responses to an Arabic version of the Hamilton Depression Rating Scale (HAM-D6). *Journal of*

- the American Psychiatric Nurses Association*, 22, 27–30. <http://dx.doi.org/10.1177/1078390316629959>
- Bertram, F., Jamison, A. L., Slightam, C., Kim, S., Roth, H. L., & Roth, W. T. (2014). Autonomic arousal during actigraphically estimated waking and sleep in male veterans with PTSD. *Journal of Traumatic Stress*, 27, 610–617. <http://dx.doi.org/10.1002/jts.21947>
- Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Gusman, F. D., Charney, D. S., & Keane, T. M. (1995). The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress*, 8, 75–90. <http://dx.doi.org/10.1002/jts.2490080106>
- Buckley, T. C., Holohan, D., Greif, J. L., Bedard, M., & Suvak, M. (2004). Twenty-four-hour ambulatory assessment of heart rate and blood pressure in chronic PTSD and non-PTSD veterans. *Journal of Traumatic Stress*, 17, 163–171. <http://dx.doi.org/10.1023/B:JOTS.0000022623.01190.f0>
- Charney, M. E., & Keane, T. M. (2007). Psychometric analyses of the clinician-administered PTSD scale (CAPS)—Bosnian translation. *Cultural Diversity & Ethnic Minority Psychology*, 13, 161–168. <http://dx.doi.org/10.1037/1099-9809.13.2.161>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.) Arlington, VA: American Psychiatric Publishing.
- \*Eckart, C., Kaufmann, J., Kanowski, M., Tempelmann, C., Hinrichs, H., Elbert, T., . . . Kolassa, I. T. (2012). Magnetic resonance volumetry and spectroscopy of hippocampus and insula in relation to severe exposure of traumatic stress. *Psychophysiology*, 49, 261–270. <http://dx.doi.org/10.1111/j.1469-8986.2011.01303.x>
- \*Eckart, C., Stoppel, C., Kaufmann, J., Tempelmann, C., Hinrichs, H., Elbert, T., . . . Kolassa, I. T. (2011). Structural alterations in lateral prefrontal, parietal and posterior midline regions of men with chronic posttraumatic stress disorder. *Journal of Psychiatry & Neuroscience*, 36, 176–186. <http://dx.doi.org/10.1503/jpn.100010>
- Foa, E. B. (2011). Prolonged exposure therapy: Past, present, and future. *Depression and Anxiety*, 28, 1043–1047. <http://dx.doi.org/10.1002/da.20907>
- Foa, E. B., Rothbaum, B. O., Riggs, D. S., & Murdock, T. B. (1991). Treatment of posttraumatic stress disorder in rape victims: A comparison between cognitive-behavioral procedures and counseling. *Journal of Consulting and Clinical Psychology*, 59, 715–723. <http://dx.doi.org/10.1037/0022-006X.59.5.715>
- \*Gjini, K., Boutros, N. N., Haddad, L., Aikins, D., Javanbakht, A., Amir-sadri, A., & Tancer, M. E. (2013). Evoked potential correlates of post-traumatic stress disorder in refugees with history of exposure to torture. *Journal of Psychiatric Research*, 47, 1492–1498. <http://dx.doi.org/10.1016/j.jpsychires.2013.06.007>
- \*Gola, H., Engler, H., Schauer, M., Adenauer, H., Riether, C., Kolassa, S., . . . Kolassa, I. T. (2012). Victims of rape show increased cortisol responses to trauma reminders: A study in individuals with war- and torture-related PTSD. *Psychoneuroendocrinology*, 37, 213–220. <http://dx.doi.org/10.1016/j.psyneuen.2011.06.005>
- Gwozdziejwycz, N., & Mehl-Madrona, L. (2013). Meta-analysis of the use of narrative exposure therapy for the effects of trauma among refugee populations. *The Permanente Journal*, 17, 70–76.
- Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery, and Psychiatry*, 23, 56–62. <http://dx.doi.org/10.1136/jnnp.23.1.56>
- Hensel-Dittmann, D., Schauer, M., Ruf, M., Catani, C., Odenwald, M., Elbert, T., & Neuner, F. (2011). Treatment of traumatized victims of war and torture: A randomized controlled comparison of narrative exposure therapy and stress inoculation training. *Psychotherapy and Psychosomatics*, 80, 345–352. <http://dx.doi.org/10.1159/000327253>
- \*Hijazi, A. M., Lumley, M. A., Ziadni, M. S., Haddad, L., Rapport, L. J., & Arnetz, B. B. (2014). Brief narrative exposure therapy for posttraumatic stress in Iraqi refugees: A preliminary randomized clinical trial. *Journal of Traumatic Stress*, 27, 314–322. <http://dx.doi.org/10.1002/jts.21922>
- Hinton, D. E., Chhean, D., Pich, V., Pollack, M. H., Orr, S. P., & Pitman, R. K. (2006). Assessment of posttraumatic stress disorder in Cambodian refugees using the Clinician-Administered PTSD Scale: Psychometric properties and symptom severity. *Journal of Traumatic Stress*, 19, 405–409. <http://dx.doi.org/10.1002/jts.20115>
- \*Johnsen, G. E., Kanagaratnam, P., & Asbjørnsen, A. E. (2011). Patients with posttraumatic stress disorder show decreased cognitive control: Evidence from dichotic listening. *Journal of the International Neuropsychological Society*, 17, 344–353. <http://dx.doi.org/10.1017/S1355617710001736>
- \*Knipscheer, J. W., Sleijpen, M., Mooren, T., June, F. J., & Aa, N. Van Der. (2011). Trauma exposure and refugee status as predictors of mental health outcomes in treatment-seeking refugees. *BJPsych Bulletin*, 39, 178–182. <http://doi.org/10.1192/pb.bp.114.047951>
- Kühn, S., & Gallinat, J. (2013). Gray matter correlates of posttraumatic stress disorder: A quantitative meta-analysis. *Biological Psychiatry*, 73, 70–74. <http://dx.doi.org/10.1016/j.biopsych.2012.06.029>
- Lanius, R. A., Vermetten, E., Loewenstein, R. J., Brand, B., Schmahl, C., Bremner, J. D., & Spiegel, D. (2010). Emotion modulation in PTSD: Clinical and neurobiological evidence for a dissociative subtype. *The American Journal of Psychiatry*, 167, 640–647. <http://dx.doi.org/10.1176/appi.ajp.2009.09081168>
- Leclercq, Y., Sheehan, D. V., Weiller, E., Amorim, P., Bonora, I., Sheehan, K. H., . . . Dunbar, G. C. (1997). The mini international neuropsychiatric interview (MINI): A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry*, 12, 224–231. [http://dx.doi.org/10.1016/S0924-9338\(97\)83296-8](http://dx.doi.org/10.1016/S0924-9338(97)83296-8)
- Lobo, I., Portugal, L. C., Figueira, I., Volchan, E., David, I., Garcia Pereira, M., & de Oliveira, L. (2015). EEG correlates of the severity of post-traumatic stress symptoms: A systematic review of the dimensional PTSD literature. *Journal of Affective Disorders*, 183, 210–220. <http://dx.doi.org/10.1016/j.jad.2015.05.015>
- Maher, C. G., Sherrington, C., Herbert, R. D., Moseley, A. M., & Elkins, M. (2003). Reliability of the PEDro scale for rating quality of randomized controlled trials. *Physical Therapy*, 83, 713–721.
- Ministry of Justice Canada. (2001). *Immigration and Refugee Protection Act, Revised Statutes of Canada*. Retrieved from <http://laws-lois.justice.gc.ca/PDF/I-2.5.pdf>
- Mørkved, N., Hartmann, K., Aarsheim, L. M., Holen, D., Milde, A. M., Bomyea, J., & Thorp, S. R. (2014). A comparison of narrative exposure therapy and prolonged exposure therapy for PTSD. *Clinical Psychology Review*, 34, 453–467. <http://dx.doi.org/10.1016/j.cpr.2014.06.005>
- Murray, E., Power, E., Togher, L., McCabe, P., Munro, N., & Smith, K. (2013). The reliability of methodological ratings for speechBITE using the PEDro-P scale. *International Journal of Language & Communication Disorders*, 48, 297–306. <http://dx.doi.org/10.1111/1460-6984.12007>
- \*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. <http://dx.doi.org/10.1186/1471-244X-14-106>
- \*Nickerson, A., Steel, Z., Bryant, R., Brooks, R., & Silove, D. (2011). Change in visa status amongst Mandaeen refugees: Relationship to psychological symptoms and living difficulties. *Psychiatry Research*, 187(1–2), 267–274. <http://dx.doi.org/10.1016/j.psychres.2010.12.015>
- \*Opaas, M., & Varvin, S. (2015). Relationships of childhood adverse experiences with mental health and quality of life at treatment start for adult refugees traumatized by pre-flight experiences of war and human rights violations. *Journal of Nervous and Mental Disease*, 203, 684–695. <http://dx.doi.org/10.1097/NMD.0000000000000330>
- Passos, I. C., Vasconcelos-Moreno, M. P., Costa, L. G., Kunz, M., Britzke, E., Quevedo, J., . . . Kauer-Sant'Anna, M. (2015). Inflammatory

- markers in post-traumatic stress disorder: A systematic review, meta-analysis, and meta-regression. *The Lancet Psychiatry*, 2, 1002–1012. [http://dx.doi.org/10.1016/S2215-0366\(15\)00309-0](http://dx.doi.org/10.1016/S2215-0366(15)00309-0)
- \*Pfortmueller, C. A., Schwetlick, M., Mueller, T., & Lehmann, B. (2016). Adult asylum seekers from the Middle East including Syria in Central Europe: What are their health care problems? *PLoS ONE*, 11, e0148196. <http://doi.org/10.1371/journal.pone.0148196>
- Pitman, R. K., Rasmusson, A. M., Koenen, K. C., Shin, L. M., Orr, S. P., Gilbertson, M. W., . . . Liberzon, I. (2012). Biological studies of post-traumatic stress disorder. *Nature Reviews Neuroscience*, 13, 769–787. <http://dx.doi.org/10.1038/nrn3339>
- Pole, N. (2007). The psychophysiology of posttraumatic stress disorder: A meta-analysis. *Psychological Bulletin*, 133, 725–746. <http://dx.doi.org/10.1037/0033-2909.133.5.725>
- Resick, P. A. (2001). Cognitive therapy for posttraumatic stress disorder. *Journal of Cognitive Psychotherapy*, 15, 321–329. Retrieved from <https://www.lib.uwo.ca/cgi-bin/ezpauthn.cgi?url=http://search.proquest.com/docview/619714240?accountid=15115>
- Resick, P. A., & Schnicke, M. K. (1992). Cognitive processing therapy for sexual assault victims. *Journal of Consulting and Clinical Psychology*, 60, 748–756. <http://dx.doi.org/10.1037/0022-006X.60.5.748>
- \*Riber, K. (2016). Attachment organization in Arabic-speaking refugees with posttraumatic stress disorder. *Attachment & Human Development*, 18, 154–175. <http://doi.org/10.1080/14616734.2015.1124442>
- Robjant, K., & Fazel, M. (2010). The emerging evidence for Narrative Exposure Therapy: A review. *Clinical Psychology Review*, 30, 1030–1039. <http://dx.doi.org/10.1016/j.cpr.2010.07.004>
- Schauer, M., Neuner, F., & Elbert, T. (2005/2011). *Narrative exposure therapy (NET). A short-term intervention for traumatic stress disorders* (2nd ed.). Göttingen, the Netherlands: Hogrefe & Huber.
- Shamseer, L., Moher, D., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., . . . PRISMA-P Group. (2015). *Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P): Elaboration and explanation*. London, UK: BMJ Publishing Group. <http://dx.doi.org/10.1136/bmj.g7647>
- Shapiro, F. (1995). *Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures*. New York, NY: Guilford Press. Retrieved from <https://www.lib.uwo.ca/cgi-bin/ezpauthn.cgi?url=http://search.proquest.com/docview/618771696?accountid=15115>
- Shoeb, M., Weinstein, H., & Mollica, R. (2007). The Harvard Trauma Questionnaire: Adapting a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Iraqi refugees. *The International Journal of Social Psychiatry*, 53, 447–463. <http://dx.doi.org/10.1177/0020764007078362>
- Shucard, J. L., Cox, J., Shucard, D. W., Fetter, H., Chung, C., Ramasamy, D., & Violanti, J. (2012). Symptoms of posttraumatic stress disorder and exposure to traumatic stressors are related to brain structural volumes and behavioral measures of affective stimulus processing in police officers. *Psychiatry Research: Neuroimaging*, 204, 25–31. <http://dx.doi.org/10.1016/j.pscychresns.2012.04.006>
- Silove, D., Manicavasagar, V., Mollica, R., Thai, M., Khiek, D., Lavelle, J., & Tor, S. (2007). Screening for depression and PTSD in a Cambodian population unaffected by war: Comparing the Hopkins Symptom Checklist and Harvard Trauma Questionnaire with the Structured Clinical Interview. *Journal of Nervous and Mental Disease*, 195, 152–157. <http://dx.doi.org/10.1097/01.nmd.0000254747.03333.70>
- Silove, D., Sinnerbrink, I., Field, A., Manicavasagar, V., & Steel, Z. (1997). Anxiety, depression and PTSD in asylum-seekers: Associations with pre-migration trauma and post-migration stressors. *The British Journal of Psychiatry*, 170, 351–357. <http://dx.doi.org/10.1192/bjp.170.4.351>
- \*Slewa-Younan, S., Chippendale, K., Heriseanu, A., Lujic, S., Atto, J., & Raphael, B. (2012). Measures of psychophysiological arousal among resettled traumatized Iraqi refugees seeking psychological treatment. *Journal of Traumatic Stress*, 25, 348–352. <http://dx.doi.org/10.1002/jts.21694>
- \*Slewa-Younan, S., Mond, J., Bussion, E., Mohammad, Y., Uribe Guajardo, M. G., Smith, M., . . . Jorm, A. F. (2014a). Mental health literacy of resettled Iraqi refugees in Australia: Knowledge about posttraumatic stress disorder and beliefs about helpfulness of interventions. *BMC Psychiatry*, 14, 320. <http://dx.doi.org/10.1186/s12888-014-0320-x>
- \*Slewa-Younan, S., Radulovic, M., Lujic, S., Hasan, T., & Raphael, B. (2014b). Trauma in resettled Iraqi refugees: Differences between those seeking psychological treatment and those not. *Journal of Aggression, Maltreatment & Trauma*, 23, 917–929. <http://dx.doi.org/10.1080/10926771.2014.955897>
- \*Slewa-Younan, S., Uribe Guajardo, M. G., Heriseanu, A., & Hasan, T. (2015). A systematic review of post-traumatic stress disorder and depression amongst Iraqi refugees located in Western countries. *Journal of Immigrant and Minority Health*, 17, 1231–1239. <http://dx.doi.org/10.1007/s10903-014-0046-3>
- Stenmark, H., Catani, C., Neuner, F., Elbert, T., & Holen, A. (2013). Treating PTSD in refugees and asylum seekers within the general health care system. A randomized controlled multicenter study. *Behaviour Research and Therapy*, 51, 641–647. <http://dx.doi.org/10.1016/j.brat.2013.07.002>
- Tate, R., Perdices, M., McDonald, S., Togher, L., Moseley, A., Winders, K., . . . Smith, K. (2004). Development of a database of rehabilitation therapies for the psychological consequences of acquired brain impairment. *Neuropsychological Rehabilitation*, 14, 517–534. <http://dx.doi.org/10.1080/09602010343000182>
- Teodorescu, D. S., Heir, T., Hauff, E., Wentzel-Larsen, T., & Lien, L. (2012). Mental health problems and post-migration stress among multi-traumatized refugees attending outpatient clinics upon resettlement to Norway. *Scandinavian Journal of Psychology*, 53, 316–332. <http://dx.doi.org/10.1111/j.1467-9450.2012.00954.x>
- UNHCR: The UN Refugee Agency. (2015). *Mid-year trends, June 2015*. Retrieved from <http://www.unhcr.org/en-us/search?query=Mid-Year%20Trends,%20June%202015>
- UNHCR: The UN Refugee Agency. (1951). *The 1951 Refugee Convention*. Geneva, Switzerland: Author.
- Ventevogel, P., De Vries, G., Scholte, W. F., Shinwari, N. R., Faiz, H., Nassery, R., . . . Olf, M. (2007). Properties of the Hopkins Symptom Checklist-25 (HSCL-25) and the Self-Reporting Questionnaire (SRQ-20) as screening instruments used in primary care in Afghanistan. *Social Psychiatry and Psychiatric Epidemiology*, 42, 328–335. <http://dx.doi.org/10.1007/s00127-007-0161-8>

Received May 4, 2016

Revision received July 29, 2016

Accepted August 2, 2016 ■