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

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Civil War: A Systematic Review

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Running head: Evidence Based Care for Asylum Seekers and Refugees of the Syrian Civil War 1

Abstract

A systematic review of literature reporting on the prevalence of assessment measures, treatments, and biomarkers used in the diagnosis and treatment of PTSD in Iraqi, Kurdish, and Syrian refugees was undertaken. A search of medical, psychological, and sociological databases was conducted 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 one study, four of which were clinically administered (Vivo checklist of war, detention, and torture; Clinically Administered PTSD Scale (CAPS); Mini International Neuropsychiatric Interview; and Hamilton Depression Scale) and three 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 MRI of lateral prefrontal regions, right inferior parietal cortex, and bilateral isthmus of the cingulate, EEG event-related potentials, hypercortisolemia, and elevated heart rate. Based on these findings, we advocate the use of the HTQ, HSCL-25 and PMLD to exclude PTSD non-cases, 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.

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, 1967). 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, 1967). 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, approximately 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 if an asylum seeker qualifies as a refugee they must demonstrate a well-found 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 if 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 (Immigration and Refugee Protection Act, 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 post-traumatic 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; Nickers et al., 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, while 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.

In order 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, fifth edition* (DSM-V) as an event that caused death, threat of death, actual or threatened injury, or actual or threatened sexual violence (American Psychiatric Association, 2013), events that indeed often befall refugee applicants. Moreover, four symptom clusters must also be present, specifically: 1) re-experiencing of such events in the form of intrusive memories, nightmares, flashbacks, or psychological or physiological distress at reminders of the event, 2) avoidance of reminders of the event, 3) various negative alterations in cognition and mood such as anhedonia, emotional numbing, guilt and/or shame, and 4) hyper-arousal, 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-behavioural therapies such as prolonged exposure therapy (PE), which involves structured repetitive re-telling 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 (Gwozdziewycz, & 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

(Gwozdziewycz, & Mehl-Madrona, 2013). There are three parts in NET, the first part (1-2

sessions) being 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 two (1 session)

involves the laying of the lifeline, where the participant uses flowers and stones to symbolize

positive and traumatic events, respectively. Lastly, part three (4-12 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, 2015).

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-1β, interferon-γ (IFN-γ), and tumor necrosis factor-α (TNF-α)). 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, while response in the ventral medial prefrontal cortex was suppressed, which could be the cause of impaired fear regulation and poor concentration). Moreover, neuroelectrophysiological 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, while 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 hypo-cortisolemia 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 manuscript, 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.

Methods

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 PEDro-P scale

(Maher, Sherrington, Herbert, Moseley, & Elkins, 2003), as supervised by the second author.

The PEDro-P rates study quality on a 1-10 scale where increasing scores reflect higher quality,

each item contributing 1 point (except for item 1). The literature search was completed through

five medical, psychological and sociological bibliographic databases (Cochrane library,

EMBASE, PsychINFO, 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: (1) 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; (2) 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[1]), coded as participant; (3) the manuscript was

written in English, coded as language; (4) the paper was a primary research article, systematic

review, meta-analysis, or literature review, coded as study type; (5) the paper was written after

2011, in order to select research articles relevant to the current Syrian conflict, coded as date (see

Figure 1).

      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 papers of interest as possible. The searched words were: "Post traumatic stress

disorder" and "Refugee", the limits activated were human participants only, manuscript available

in English only, and only manuscripts dating from January 2011 to the day the search was

conducted (22 March 2016). After the initial keyword search, 670 manuscripts 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) in 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

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

letters or commentary articles about a manuscript, 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, while 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.

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 due to these studies only being descriptive in

nature rather than treatment trials, therefore rendering several PEDro-P ratings not applicable; by

contrast, both manuscripts 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* (Lecrubier et al., 1997);

Hamilton Depression Rating Scale (Hamilton, 1960); *Harvard Trauma Questionnaire* (Shoeb et

al., 2007); *Hopkins Symptoms Checklist-25* (Ventevogel et al., 2007); and *the Post Migrational Living Difficulties Questionnaire* (Silove et al., 1997).

<u>Clinically Administered</u>

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 frequency and severity (re-experiencing, avoidance, hyperarousal), as well as duration of symptoms and associated features (survivor's guilt, depersonalization, derealisation), over interviews that generally last 40-60 min (Blake et al., 1998). 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 (M.I.N.I)* was used in seven studies with a cumulative sample size of 258 87% of whom 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 (major depressive disorder, anxiety disorders), and takes about 15-25 min to administer and has also displayed good reliability and validity (Lecrubier et al., 1997).

Finally, the *Hamilton Depression Scale* (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 15-20 min and has 21-items although only the first 17-items are typically scored. A score of 0-7 is classified as normal, 8-13 mild depression, 14-18 moderate depression, 19-22 severe depression, and greater or equal to 23 very severe depression (Hamilton, 1960). The HAM-D has also displayed acceptable psychometric properties (Bachner, 2016).

Self-Report

The *Harvard Trauma Questionnaire* (HTQ) was used in ten studies was used in two studies with a cumulative sample size of 1472 (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 two. Subsequently, the third part of the questionnaire gathers personal information from the patient before part four, 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 *Hopkins Symptoms Checklist-25* (HSCL-25) assesses depression and anxiety symptoms, and was used in six studies with a cumulative sample size of 1779 (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 *Post Migrational Living Difficulties Questionnaire* was used in two studies

was used in six studies 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 *Narrative Exposure*

Therapy (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 non-

systematic 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, while only 14.2% labelled 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 group (WLC). 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), while increasing in the WLC group (d'= -0.97 for CAPS, and d'= -0.07 for HAM-

D), as assessed at 4 months post-treatment. 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, Hijzai et al. (2014) compared a NET group to a WLC

group, but only a brief NET was used, comprised of 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 (3 sessions) over the

course of 2 and 4 months compared to the WLC group. No other treatments were used in the

remaining 15 manuscripts that were included for the present systematic review.

Biomarkers

Magnetic resonance imaging (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 to a non-trauma exposed control group, effects that were correlated with dissociation sub-scores. 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 to 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 to participants with PTSD and non-trauma-exposed healthy controls.

Cortisol

Cortisol was measured based on trauma type (rape, other traumas), whereby a decrease in salivary cortisol levels in a PTSD non-raped group was observed, while the opposite was found for a PTSD raped group (Gola et al., 2012). As well, over the course of the interview, cortisol levels decreased in the non-raped group, whereas the reverse occurred in the raped 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.

Heart-rate (HR)

An increase in resting HR was found in a PTSD group when compared to controls

(Slewa-Younan et al., 2012). However, there were no significant differences in HR between

those with PTSD versus other disorders. Interestingly, HRV was not significantly different

between controls and the PTSD group. Slewa-Younan et al. (2012) stated that while 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 (the *Clinician-Administered PTSD Scale*), and related

psychological symptoms and disorders (e.g., the *Mini International Neuropsychiatric Interview*

and *the Hamilton Depression Scale*) 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: *Harvard Trauma Questionnaire,*

Hopkins Symptom Checklist-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 *Harvard Trauma Questionnaire;* in the presence of a high symptom endorsement, the clinician may follow-up with a diagnostic interview such as the *Clinician-Administered PTSD Scale* (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 in order 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, where 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, also generally display good clinical utility for the target population. This is especially true in the case of the *Harvard Trauma Questionnaire* (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 non-cases 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 non-cases, followed by the structured diagnostic interview to confirm diagnosis

in those who have already scored high on the self-report questionnaire. Based on the findings of

this systematic review, we would accordingly suggest the HTQ be used first to exclude non-

cases for PTSD and related psychiatric disorders, the HSCL-25 be used in order to exclude non-

cases 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,

while the HAM-D or a similar instrument may be administered to assess for diagnosis of

comorbid depression.

Treatment

　　　　Narrative Exposure Therapy (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, prolonged exposure therapy (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. While 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 based 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 lifespan, whereas PE tends to focus on the

effects of a single traumatic life event. As well, 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 to WLC, 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%[2]) and 1-year post test (37%[2]), whereas SIT decreased PTSD symptoms only at 6 months

(20%[2]). 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 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 medical 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).

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[2] No longer met the criteria for PTSD

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 non-specific measure to acquire of PTSD relevance is heart-rate (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, in order 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 healthcare. 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 upon 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, that is, 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.

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Table 1

Table 1. Summary of the 17 studies included in the systematic review.

	Study	Title	N	Participants	Results
Assessment	**Johnsen et al., 2011**	Patients with Posttraumatic Stress Disorder Show Decreased Cognitive Control: Evidence from Dichotic Listening	45	Mixed background, with the majority from Middle East (n = 25).	The PTSD[1] groups demonstrated REA[2] during dichotic listening at all times whereas the control group were able to shift between REA and LEA[2], as expected.
	Knipscheer et al., 2015	Trauma exposure and refugee status as predictors of mental health outcomes in treatment-seeking refugees	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	Change in visa status amongst Mandaean refugees: Relationship to psychological symptoms and living difficulties	101	Mandaean refugees.	Refugee status from TPV[3] to PR[4] was associated with significant decrease in PTSD and depression symptoms and an increase in QoL[5].
	Nickerson et al., 2014	Posttraumatic stress disorder and prolonged grief in refugees exposed to trauma and loss	248	Mandaean refugees.	Divergent PTSD and PGD[6] symptom profiles in trauma exposed populations.
	Opaas et al., 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	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.

[1] Post traumatic Stress Disorder
[2] Right Ear Advantage (REA); Left Ear Advantage (LEA)
[3] Temporary Protection Visa
[4] Permanent Residency
[5] Quality of Life
[6] Prolonged Grief Disorder

		Rights Violations			
	Pfortmueller et al., 2016	Adult Asylum Seekers from the Middle East Including Syria in Central Europe: What Are Their Health Care Problems?	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	Attachment organization in Arabic speaking refugees with post traumatic stress disorder	43	Mixed background (n = 26 Iraqi).	There was low secure-autonomous attachment and high unresolved-disorganized attachment in this refugee sample.
Assessment	Slewa-Younan et al., 2014a	Mental health literacy of resettled Iraqi refugees in Australia: knowledge about posttraumatic stress disorder and beliefs about helpfulness of interventions	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	A Systematic Review of Post-traumatic Stress Disorder and Depression Amongst Iraqi Refugees Located in Western Countries		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%).
Biomarker	Eckart et al., 2011	Structural alterations in lateral prefrontal, parietal and posterior midline regions of men with chronic posttraumatic stress disorder	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.

	Eckart et al., 2012	Magnetic resonance volumetry and spectroscopy of hippocampus and insula in relation to severe exposure of traumatic stress	52	Same as Eckart et al., 2011 study with the exclusion of 5 participants for not completing the MRI[7] scan.	There was no significant difference in hippocampal or insula volumes as well as NAA[8] concentrations. The PTSD group performed worse on memory tests compared to the control group.
Biomarker	**Gjini et al., 2013**	Evoked potential correlates of Post Traumatic Stress Disorder in refugees with history of exposure to torture	60	60 Iraqi refugee's split evenly between controls, trauma exposed without PTSD, and PTSD group.	There was a decrease in P50 S1[9] amplitude for PTSD and TE[10] 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[11] amplitude and gating for the PTSD group compared to control only. Finally, N150 S2[12] amplitude increased in TE without PTSD compared to the other two groups.
	Gola et al., 2012	Victims of rape show increased cortisol responses to trauma reminders: A study in individuals with war- and torture-related PTSD	58	Mixed background with 21 Middle Eastern participants. Three groups, control (n = 28); raped (n = 10); and non-raped (n = 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.

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[7] Magnetic Resonance Imaging

[8] N-acetyl-aspartate (type of brain metabolite)

[9] Positive deflection with a latency of 50ms (P50); Paired-click paradigm consists of two identical clicks, S1 being the first click

[10] Trauma Exposed

[11] Negative deflection peaking at about 75ms (N75)

[12] Negative deflection peaking at about 150ms (N150); S2 being the second click in the paired-click paradigm

	Slewa-Younan et al., 2012	Measures of Psychophysiological Arousal Among Resettled Traumatized Iraqi Refugees Seeking Psychological Treatment	25	All were resettled Iraqi refugees	There was an increase in resting HR[13], but no significant difference in HRV[14].
	Slewa-Younan et al., 2014b	Trauma in resettled Iraqi Refugees: Difference between Those Seeking Psychological Treatment and Those Not Seeking Psychological Treatment	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 HR compared to the control group, but differences were not significant between the treatment seeking and non-treatment seeking group.
Treatment	**Adenauer et al., 2011**	Narrative exposure therapy for PTSD increases top-down processing of aversive stimuli evidence from a randomized controlled treatment trial	34	NET[15] group (n = 16) and WLC[17] (n = 18). Groups consisted of mixed demographics, mainly middle eastern (NET n = 8; WLC n = 11).	NET[15] decreased CAPS[16] and HAM-D scores compared to WLC[17]. Four months later 45.5% of the NET group no longer met the criteria for PTSD.
	Hijazi et al., 2014	Brief Narrative Exposure Therapy for Posttraumatic Stress in Iraqi Refugees: A Preliminary Randomized Clinical Trial	63	All participants were Iraqi refugees.	There was a significant treatment effect at 2 and 4 months. NET increased wellbeing, and decreased PTSD and depression symptoms after 2 months. By 4 months, 47.2% of the NET group reported that their symptoms had

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[13] Heart Rate

[14] Heart Rate Variability

[15] Narrative Exposure Therapy

[16] Clinically Administered PTSD Scale

[17] Wait List Control

improved. Lastly, NET improved posttraumatic growth, indicating potential recovery from trauma.

Table 2

PEDro 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., 2015	Nickerson et al., 2011
1. Eligibility Criteria were specified[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
2. Subjects were randomly allocated to groups	1	0	0	0	0	1	0	0	0
3. Allocation was concealed	1	0	0	0	0	1	0	0	0
4. Groups were similar at baseline	1	0	0	0	0	1	0	0	0
5. "Blinding" of all subjects	0	0	0	0	0	1	0	0	0
6. "Blinding" of all therapist	0	0	0	0	0	1	0	0	0
7. "Blinding" of all assessors	0	0	0	0	0	0	0	0	0
8. Appropriate monitoring	0	1	1	1	1	1	1	1	1
9. Intention to treat analysis	1	0	0	0	0	1	0	0	0
10. Intergroup comparisons	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
Total Score	5/10	2/10	2/10	3/10	2/10	7/10	2/10	2/10	2/10

Table 2. PEDro-P rating scale and scores for respective manuscripts included in the systematic review (item 1 not scored).

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[1] External Validity (Items 2-11 measure internal validity)

PEDro Scale / Studies	Nickerson et al., 2014	Opaas et al., 2015	Pfortmueller et al., 2016	Riber, 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[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.Subjects were randomly allocated to groups	0	0	0	1	0	0	0	0
3.Allocation was concealed	0	0	0	0	0	0	0	0
4.Groups were similar at baseline	0	0	0	0	0	0	0	0
5."Blinding" of all subjects	0	0	0	0	0	0	0	0
6."Blinding" of all therapist	0	0	0	1	0	0	0	0
7."Blinding" of all assessors	0	0	0	1	0	0	0	0
8.Appropriate monitoring	1	1	1	1	1	1	1	0
9.Intention to treat analysis	0	1	0	1	1	0	0	0
10.Intergroup comparisons	1	1	1	1	1	1	1	1
11.Point measures and measure of variability	1	1	0	0	0	0	0	0
Total Score	3/10	4/10	2/10	6/10	3/10	2/10	2/10	1/10

Table 2. PEDro-P rating scale and scores for respective manuscripts included in the systematic review (item 1 not scored).

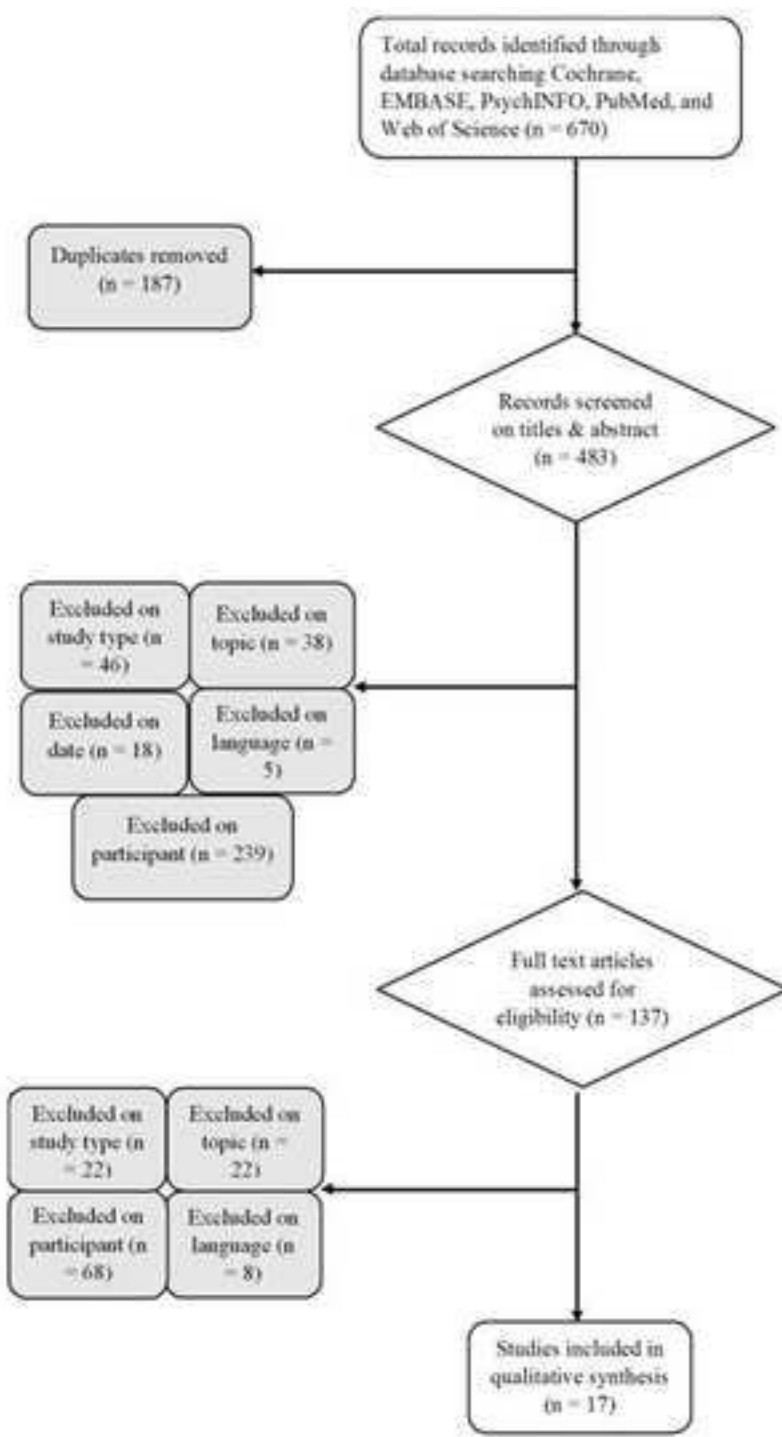[1] External Validity (Items 2-11 measure internal validity)