An explorative outcome study of CBT-based multidisciplinary treatment in a diverse group of refugees from a Danish treatment centre for rehabilitation of traumatized refugees

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Abstract

A group of highly traumatized refugees (n = 26) with diverse cultural backgrounds in a Danish Clinic for Traumatized Refugees (CTR) was assessed for symptoms of post-traumatic stress disorder and other aspects of general functioning. Patients were assessed at intake, after the end of treatment and six months later. The results point to very high symptom levels and a large need for treatment in this population. Psychiatric symptoms and their correlates were assessed with the Harvard Trauma Questionnaire (HTQ), the Trauma Symptom Checklist-23 (TSC-23), the Global Assessment of Function (GAF), and the Crisis Support Scale (CSS). The Trail Making Test A & B (TMT) was used as a screening instrument for acquired brain damage, with promising results. Indications of effectiveness from 16-18 weeks of multidisciplinary treatment (physiotherapy, pharmacotherapy, psychotherapy, and social counseling) were supported with small to medium effect sizes on most outcome measures. The results are discussed in terms of clinical implications and future treatment, assessment, and research needs.

Introduction

According to the UN, refugees are defined as individuals forced to flee their countries

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because of fears of persecution on grounds of belonging to certain racial, religious, national, social or political groups. They are unable to seek protection from persecution in countries of their own citizenship and are thus seeking refugee status in other countries. The number of refugees under UNHCR's protection has rounded 11.4 million during the year 2007. Europe is housing about 14% of the world's refugees.[1, 2] The large numbers of people seeking refuge and help call for the development of knowledge that will enable appropriate health care and treatment in receiving countries.

A high percentage of refugees have experienced physical and mental hardships in the form of forced migration, starvation, near-death experiences, torture, disease, injury and loss or killing of family and close friends. Because of the physical and mental strain of refugee life, this population is known to have an increased risk of physical and mental health problems.[3] In a review of quantitative research on refugees' mental health Keyes[4] identifies posttraumatic stress disorder (PTSD), depression, anxiety, dissociation, and psychosis as the most frequently found negative mental health states in refugees. According to ICD-10[5] trauma is defined as a situation of exceptionally threatening or catastrophic nature, which is likely

to cause pervasive stress to almost anyone. By this definition, refugees are likely to have experienced a number of traumas before arrival to the host countries, which puts them at risk of developing PTSD. PTSD is characterised by core symptoms of 1) re-experiencing of traumatic events in memory through intrusive thoughts and dreams, 2) avoidance of trauma-reminding stimuli and 3) physiological hyperarousal or alert-ness. Because refugees often experience multiple trauma of long duration, PTSD may manifest itself differently in this population than in clinical PTSD populations who have been exposed to isolated traumatic events (natural disasters, man made accidents, assaults and the like).

While earlier research was focused on relating specific trauma types to psycho-pathological outcomes, recent studies are acknowledging the wealth of mediating factors between traumatizing experiences and mental health outcomes as well as the existence of a range of pathological and non-pathological reactions to trauma.[5-8] A large population study found that physical and mental health problems are highly prevalent in refugees and asylum seekers in the Netherlands.[9] Compared to refugees, asylum seekers who have uncertain refugee status had worse mental and physiological health outcomes. Studies also indicate that rates of PTSD and mood disorders are higher in resettled refugees than in their counterparts who did not migrate. This would imply, that the migration processes and post migration factors are adding to the severity of PTSD symptoms.[6] Different stressful post-migration effects have been found to predict maintenance of PTSD. Unemployment, lack of social contacts, and lack of language proficiency are among the most often cited.[7, 8, 10, 11]

This complex interplay of individual traumatic experiences and pre and post migration factors in symptom development makes prevalence estimates of PTSD difficult to compare. Estimates of PTSD in tortured refugees vary from 14%-91%.[10] They vary from 24%-71% in traumatized, non-tortured refugees surveyed by self report instruments and from 12%-26% in traumatized refugees surveyed by interview method.[10] In a meta-analysis of prevalence of serious mental disorder in refugees re-settled in western countries, 9% prevalence for PTSD, 4-6% prevalence for depression, and 3-6% prevalence for generalized anxiety disorder were found, with very high comorbidity between the states.[12] These estimates are much lower than others usually cited. Nevertheless, these relatively low estimates imply that at least several tens of thousands of refugees in western countries have PTSD.

Longitudinal studies indicate that PTSD symptoms, along with symptoms of anxiety and depression, for many refugees are persistent for decades.[13-15] A series of studies documenting development of PTSD and depression in Khmer youths who suffered trauma as children show that 35% still met diagnostic criteria for PTSD after a follow-up period of 12 years. While depression rates tended to diminish over time, new/delayed occurrences of PTSD were seen even at the time of a 12 year follow-up.[15] In a study of a clinical sample of tortured refugees surveyed for treatment but not treated in a Danish rehabilitation centre, a reduction in symptoms of PTSD, depression, and anxiety over a period of ten years was documented. Thirty percent of the study population were below the clinical cut off for PTSD at 10 year follow-up compared to 65% scoring above the HTQ cut-off (2.5) for PTSD at baseline. Mean scores on the Harvard Trauma Questionnaire (HTQ) decreased from 2.73 at baseline to 2.37 at follow-up.[8] These studies point to the possibility that only about 15-

30% of not treated refugees with PTSD are symptom-free decades after traumatization. A percentage remains chronically ill despite the time lapse and intensive treatment.[6,16-18]

Only a handful of studies have examined and documented the psychological state of traumatized refugees in Denmark. Among these were studies examining levels of traumatization in young Bosnian refugees,[19] evaluations of psychoeducation programmes for refugee children from Kosovo,[20,21] evaluation of mental status in rejected asylum seekers in Danish asylum centres,[22] and a study of social problems in tortured refugees.[23] Three studies about long term mental health outcomes in tortured refugees have also been published recently.[8, 11, 24] These studies were carried out at the RCT in Copenhagen and included tortured refugees only (torture is understood in correspondence with the UN conventions. The same definition is used throughout the article). In this study, we set out to describe a comprehensive patient population in a smaller treatment centre.

Aims
Research indicates that a complex interplay of pre-migratory and post-migratory factors is of importance for the development and maintenance of PTSD, anxiety and depression symptoms as well as their chronicity and treatment-outcomes in refugee populations. The aims of this study were twofold: First, the study was explorative. We wanted to describe a specific, culturally diverse population of refugees admitted to the Treatment Centre for Rehabilitation of Traumatized Refugees (CTR) in Holstebro, Denmark, in terms of traumatization and symptom levels as well as global functioning and social support. Systematic descriptions of refugee treatment populations in Denmark are needed because of socio-political

circumstances specific to this country, where no orchestrated national system for treatment of traumatized refugees existed before 2005.

There are 12 specialized centres for treatment of traumatized and/or tortured refugees and a number of private and general mental health treatment options available for refugees in Denmark today. A recent Danish Health Technology Assessment report[3] concluded that the efforts of these governmental agencies are not well orchestrated; treatment capacity is insufficient and treatment effectiveness is as yet not established. There is therefore a need to describe the symptom levels of the treatment populations in a systematic way to assess the treatment needs.

Secondly, we wanted to assess the effectiveness of the multidisciplinary treatment offered at the CTR. Besides validated measures of PTSD symptomatology, and because of the exploratory nature of the study, we also included a measure of cognitive functioning. As a result of undernourishment or thirst for prolonged periods or/and different forms of torture e.g. suffocation and beating to the head, torture survivors and refugees may acquire brain damage. Acquired brain damage (ABD) due to traumatic brain injury (TBI) is often diffuse, the most common symptoms being memory and attention deficits, apathy, labile affect, impaired social judgment, distractibility, and impulsivity.[25] Traumatic brain injury can consequently easily be confounded with PTSD. Mollica, Henderson & Tor[26] have reported a considerable amount of traumatic brain injury events in a civilian Cambodian sample. Uncovering ABD in refugees in western countries has important implications for social adaptation and psychosocial treatment in the host country.

Table 1. *Sex and country of origin in the sample.*

		Iraq	Iran	Kuwait	Sri Lanka	Ivory Coast	Bosnia and Herzegovina	Chechnya	Lebanon	Serbia
Male	14	3	1	1	0	1	4	1	2	1
Female	12	2	0	0	1	0	4	0	4	1
Total	26	5	1	1	1	1	8	1	6	2

Method

Participants

The inclusion criteria for the study comprised all the patients admitted for treatment at the CTR in Holstebro from August 2007 to September 2008. Forty-one patients meeting the centre's admission criteria (ICD-10[27] diagnosis *F43.1 PTSD* or *F43.2 adjustment disorders, F62.0 enduring personality change after catastrophic experience*) completed a visitation process. Nine patients were not offered treatment due to the presence of other mental health problems that demanded primary attention (e.g. organic brain damage, schizophrenia, and personality disorder). The final study sample consisted of the remaining 32 patients who were offered treatment at the centre. Three of the participants terminated the treatment untimely, while one of the psychologists forgot to assess three other participants at the end of the treatment. Unfortunately, the data on the three participants without a complete dataset, and the three participants that dropped out of treatment went missing in the RCT archives.

The study presents results on the final n = 26 treated participants with complete data sets for all three assessment times. This sample consisted of 54% male and 46% female patients, aged between 19 and 65, with a mean age of 39 years (SD 9.9). Reflecting the diversity of the patients' cultural backgrounds at the CTR, the participants in the study were from nine different countries with Bosnian, Lebanese, and Iraqi patients being the three largest groups, representing 30%, 23%, and 19% of the sample, respectively. A complete overview of the participants' cultural backgrounds is presented in Table 1. The mean time since resettlement in Denmark was 11.9 years (SD =5.7) ranging from 1-24 years. 73% of the participants were married, the rest were widowed or divorced.

Procedure

The participants received 16-18 weeks of multidisciplinary treatment, consisting of once weekly individual psychotherapy session and once weekly physiotherapy session. Patients were treated by two psychologists and two physiotherapists. The levels of psychiatric symptoms and social support were assessed by the two psychologists at three different assessment points: before treatment, after the end of treatment, and at the six month follow-up. All self-report measures were translated into participants' native languages by a process of back translation. The assessment procedure was carried out by the psychologist that had been treating the patient, except at follow-up, where only one of the psychologists was carrying out the assessments. The assessments were conducted at the CTR before the psychotherapy sessions.

Treatment

The psychological treatment was predominantly cognitive behavioural therapy (CBT) with focus on exposure. Three patients received CBT with elements of eye movement

desensitisation and reprocessing therapy (EMDR). The specific CBT methods resembled treatment for panic attacks with psychoeducative elements, use of trauma hierarchies, in vitro exposure where the patient relives the trauma through remembering, breathing exercises, and training in coping with the anxiety and fear. Trauma treatment at the CTR is also structured after principles of 1) stabilization, 2) coming to terms with the trauma, and 3) integration of traumatic memories and grieving following Judith Herman's model.[28]

The physiotherapy consisted of Body Awareness Therapy, and education on body awareness in coping with pain and stress. The psychotherapeutic and physiotherapeutic treatments were delivered during the same interval of 16 weeks. They were otherwise independent of each other.

All the participants were in pharmacotherapy during the study, mostly with antidepressants (SSRI). A couple of patients received high dosages of antipsychotic medication (Risperidon or Seroquell). The medications were prescribed by the general practitioner, but it was not possible to determine whether the patients have been taking the medication, or whether they were following the prescriptions when taking the medication. The effects of the pharmacotherapy are hence undocumented.

The overarching principle at the treatment centre is the one of shared care, with involvement from patients' general practitioner and social workers from the municipality. The GP is responsible for the pharmacotherapy, the social work is done primarily independently of the psycho and physiotherapeutic efforts. The RCT has a coordinating responsibility, which is established through at least three obligatory network meetings between the different actors during the 16-week treatment period.

Outcome measures
Demographic information about participant's age, sex, country of origin, clinically determined diagnosis by Schedules for Clinical Assessment in Neuropsychiatry (SCAN)[29] (according to ICD-10), and scores on The Global Assessment of Functioning (GAF)[6] were obtained from the CTR patient register. SCAN is a computerized semi-structured clinical interview. GAF is the fifth axis in the DSM system and was applied as a measure of global mental health.

The remaining data which were used to assess treatment outcomes came from self-report measures. Magnitude of experienced trauma was assessed on the Harvard Trauma Questionnaire part I, which was originally developed for the Indo-Chinese populations.[31, 32] The version used here was slightly revised for the patient population at the CTR. Items pertaining to "brainwash" and "lack of housing" were excluded, while additional items found descriptive of this population (forced labor, psychological violence and lost home), were included. Participants were asked to state whether they were directly or indirectly (by witnessing) exposed to the events. All the items from the questionnaire are shown in Table 2.

PTSD symptomatology was assessed by the Harvard Trauma Questionnaire (HTQ) part IV 31 comprising 16 items, covering PTSD symptoms of re-experiencing, avoidance/numbing and physiological arousal as described in DSM- IV, along with an additional 14 trauma related symptoms known to be descriptive of refugees' traumatic experiences. The scale was scored on a Likert type scale from 1 "not at all" to 4 "almost always". In the Indo-Chinese version of the HTQ a cut-off score of < 2.5 was estimated to differentiate between clinical and non-clinical presence of PTSD31. The need to establish appropriate cut-offs for

Table 2. *Overview of experienced and witnessed types of trauma with percent wise changes in reporting (irrespective of direction). Percentages in parentheses.*

Type of trauma	Number of participants who have experienced the trauma	Reporting difference: baseline versus the end of treatment (self-experienced)	Number of participants who have witnessed the trauma	Reporting difference: baseline versus the end of treatment (witnessed)
1 Life-threatening experience	24 (92)	+2 (8.3)	25 (96)	−1 (4)
2 Physical violence (being hit or kicked)	24 (92)	0 (0)	25 (96)	−2 (8)
3 Psychological violence (harassment, humiliation)*	25 (96)	+1 (4)	26 (100)	−1 (3.8)
4 Rape	6 (23)	+2 (66.6)	16 (62)	+6 (37.5)
5 Other forms of sexual assault	7 (27)	+5 (71.4)	14 (54)	+5 (35.7)
6 Imprisonment	18 (69)	+6-1 (38.8)	20 (77)	+5-1 (30)
7 Loss of close relatives or family members	26 (100)	−1 (3.8)	26 (100)	−2 (7.7)
8 Loss of friends	26 (100)	−1 (3.8)	26 (100)	−2 (7.7)
9 Loss of home*	24 (92)	+2 (8.3)	25 (96)	+1 -2 (12)
10 Loss of possessions	24 (92)	+1 (4.1)	25 (96)	+1-2 (12)
11 Ruined home	24 (92)	+2-5 (29.1)	24 (92)	+1-5 (25)
12 Being shot at	24 (92)	+2 (8.3)	24 (92)	+1-1 (8.3)
13 Thinking that you are going to die	25 (96)	+1 (4)	23 (88)	+2-1 (9.4)
14 Long-lasting hunger/thirst	20 (77)	+3-1 (20)	20 (77)	+3-2 (25)
15 Observed killing	15 (58)	+7-1 (53.3)	20 (77)	+4-3 (35)
16 Having seen dead or hurt people	22 (85)	+3-1 (18.2)	21(81)	+3-1 (19)
17 Having been injured	16 (62)	+5-1 (37.5)	19 (73)	+3-2 (26.3)
18 Torture	10 (38)	+4-2 (60)	14 (54)	+3 (21.4)
19 Forced labour*	9(35)	+3-2 (55.6)	12(46)	+3-3 (50)
20 Being ill without possibility of getting medical treatment	18 (69)	+2-4 (33.3)	19 (73)	+3-5 (42)
21 Not knowing if family or friends are alive	21(81)	+4-1 (23.8)	21 (81)	+5-2 (33)
22 Feeling helpless	22 (85)	+3 (13.6)	20 (77)	+5-1 (30)
23 Other	2 (8)	0 (0)	2 (8)	0 (0)
Total	432	81 (18.7)	467	94 (20.1)
Mean (SD)	16.62 (3.77)	3.5	17.96 (3.65)	4.1

*) Items added by the authors to the original HTQ-part I.

the instrument in different research settings and populations has been pointed out.[31,33] Others, in the meantime, have replicated the discriminant property of the cut-off of < 2.5 in other populations.[34] The cut-off of < 2.5 was therefore also used here, as it has been widely used in similar research. For assessing the presence of PTSD by the HTQ, an algorithm according to DSM-IV criteria for diagnosis of PTSD was also applied. According to the algorithm, presence of at least one re-experiencing symptom, at least three avoidance/numbing symptoms and at least two symptoms of physiological alertness, with a score of three or four, are indicative of PTSD.

Assessment of general symptoms of psychological distress was carried out through the Trauma Symptom Checklist (TSC-33), an instrument originally designed for assessing the impact of child sexual abuse on later functioning.[35] The TSC-33 is a measure with documented applicability to other traumatized populations,[35, 36] especially when keeping in mind its considerable overlap with other general measures of psychological distress (e.g. Derogatis' SCL-90[37] and HSCL-25[32]). The revised version, TSC-23,[38] which is also used here has been abbreviated for better construct validity. It contains two subscales: negative affectivity and somatization. The scales among themselves comprise a number of symptoms of depression, anxiety and dissociation, as well as somatic complaints such as headache, digestion and respiration problems. The scale is scored on a Likert type of scale from 1 "never" to 4 "very often". The items are summed up to give the total score.

For assessing levels of social support suspected to have a mediating effect on development of post-traumatic symptoms,[39, 40] the Crisis Support Scale (CSS)[41] was used. The scale consists of seven items measuring different aspects of social support rated on a 7 point Likert scale with higher scores indicating more support. Participants are asked to rate levels of social support twice. First, pertaining to perceived support at the time of experienced traumatization and secondly pertaining to levels of present social support.

The Trail Making Test (TMT),[42-45] measures the capacity to change cognitive track from one task to another. It was used to assess potential presence of acquired brain damage due to traumatic brain injury. Consisting of part A, 25 numerated circles, and part B, 13 numerated circles and 12 circles with letters A to L, part A requires connecting circles in numerical order while part B requires the participant to connect the circles with corresponding letters (e.g. 1A, 2B, and so on). The time to solve the two parts is measured and compared to standard scores. Letters were written in the native writing of the refugees. The TMT is used as a screening instrument for brain damage and is also easy to administer and score. Having refugees' diverse cultural backgrounds in mind and cultural specificity of most cognitive tests, the relatively simple and value free TMT was suspected to be an acceptable and probably a valuable contribution to the assessment of refugees' cognitive difficulties.

Statistical analyses
Most of the data turned out not to be normally distributed. Wilcoxon signed ranks tests were performed for assessment of differences in pre-treatment, post-treatment, and follow-up scores on those self report measures which yielded unusually distributed data. Because of the very small sample size, the significance level was kept at $p < 0.05$, despite the repeated measures design. Differences in scores between normally distributed data were evaluated with one-way repeated measures ANOVA. Associations between different

measures of mental health were explored using the Chi-square statistic. Effect size for the Wilcoxon signed rank tests was calculated as $r = Z / \sqrt{n}$, where n is the number of observations over the two assessment points. Cases were excluded pair wise in case of missing values. All the analyses were performed using the SPSS 17.0 programme.

Limitations
In interpreting the results it is important to keep in mind that the data set was incomplete due to the six missing assessments. Standard procedures for evaluating the impact of missing data and differences between the treated sample and the drop-outs could not be performed. The lack of randomization and control group is also limiting the representativity of this small sample. In addition, a number of the applied scales proved to have insufficient reliability scores.

Results
Changes in diagnostic status
At the beginning of the study, all the patients were diagnosed with (ICD-10) F43.1 Post-traumatic Stress Disorder, four had an additional diagnosis of *Y07.3 maltreatment by official authorities*. At the end of treatment, two of the patients were no longer diagnosed with F43.1, PTSD but with F62.0 – *enduring personality change after catastrophic experience*. Diagnostic status remained the same for the rest of the patients as it was at the end of treatment.

Exposure to traumatic events
The participants experienced a mean of 16.6 (SD= 3.8) trauma types and witnessed a mean of 18 (SD = 3.65) trauma types out of 23 possibilities. All have experienced loss of close relatives or family members, 92% have felt that their life was endangered, 92% have experienced physical violence, 69% have been imprisoned and 38% tortured. An overview of experienced and witnessed trauma types is presented in Table 2. The numbers are approximations of trauma reporting at baseline. A certain amount of change in the reporting of traumas was observed between the assessment at baseline, the end of treatment, and follow-up, amounting to approximately 20%. As a whole, there was a trend of reporting on more traumas with time. Alterations in trauma reporting among refugee populations are a known and researched phenomenon.[46,47] Also, cognitive malfunction, confusion, and alterations in recall and declarative memory seem to accompany prolonged and chronic PTSD.[7, 48, 49]

PTSD symptoms as assessed by the HTQ
Scale reliability: Although the HTQ is widely used in cross-cultural research[31-34] and is known to have good internal consistency, the Cronbach alpha coefficient in the current study was very low. Several items had to be excluded from the analyses of scale reliability because there was not any variance in respondents' scores. A closer inspection of the scores revealed unusual distributions because all subjects were scoring maximum on many items. The necessary exclusion of items due to lack of variance in scores could explain the low alpha values, since they are sensitive to the number of items in the scale.

Symptoms of PTSD as measured by the HTQ were generally high in the population. Mean score for the total scale was 3.7 (SD =) and 3.9 (SD =) for the 16 PTSD items at baseline. All the participants were above the cut-off score of > 2.5 at all three assessment times. According to the DSM-IV algorithm, all the participants (100%) had PTSD at baseline, 88.5% at the end of the treatment, and 96.2% at follow-up.

Treatment effectiveness as assessed by the HTQ
Overall treatment seemed to have had an effect on the PTSD symptoms. Variation in the magnitude of effectiveness was observed with different types of PTSD symptoms. Wilcoxon signed rank test revealed statistically significant reduction in HTQ total scores between baseline and the end of treatment ($z = -4.1$, $p < 0.0005$) with a large effect size ($r = 0.57$). The median score decreased from pre-treatment (Md = 105.5) to post-treatment (Md = 99). The presumed treatment effect was maintained at the six month follow-up ($z = -3.7$, $p < 0.0005$, $r = 0.51$, Md pre-treatment = 105.5, Md follow-up = 96.5).

A significant decrease in symptom scores on the HTQ re-experiencing scale were not observed between baseline and the end of treatment, but were evident at follow-up ($z = -2.9$, $p < 0.005$) with a small effect size ($r = 0.24$). Median at pre-treatment was 16, and at follow-up it was 16.

Significant decrease in scores on the avoidance/numbing scale was found between baseline and the end of treatment ($z = -4.4$, $p < 0.005$) with a large effect size ($r = 0.61$), pre-treatment Md = 28, post-treatment Md = 22.5, and also a maintenance of symptom reduction at follow-up ($z = -3.9$, $p < 0.000$, $r = 0.54$) and a Md = 23 at follow-up. Finally, Wilcoxon signed rank test did not reveal any significant changes in symptoms on the HTQ arousal scale at any point of assessment.

These results imply that multidisciplinary treatment at CTR probably played a role in reducing specific PTSD symptoms as defined by the diagnostic criteria in DSM-IV, which are entailed in the HTQ. The largest effect sizes were found for core symptoms of avoidance-numbing and smaller, but still significant reductions in symptoms of re-experiencing/intrusion. Effectiveness

in reducing symptoms of hypervigilance was not observed. The means and standard deviations of the HTQ scores are to be found in Table 4.

The Global Assessment of Functioning
The global mental health as measured by the GAF was generally low. The mean scores at baseline were ranging from 36: *major impairment in several areas of function; school/work, family relations, judgment, thinking or mood, to 45: serious impairment in social occupational or school functioning,* with a mean of 40.4, (SD = 2.95). One-way repeated measures ANOVA revealed a significant improvement in GAF scores between the three assessment times (Wilk's Lambda = 0.37, F (2,23) = 19.24, $p < 0.0005$, multivariate partial eta squared = 0.63). Post hoc analyses showed a significant effect between baseline and the end of treatment, and maintenance of effect at the six month follow-up. Although improvement was observed, global mental health remained poor as indicated by low mean scores on the GAF = 48.5 (SD = 7.60) at follow-up. Table 3 summarizes means and standard deviations on all the mental health outcome measures.

Symptoms of psychological distress as assessed by the TSC
As observed with the HTQ, a great deal of respondents was scoring very high on the TSC. The lack of variation made it hard to obtain reasonable Cronbach's alpha values. The scale is otherwise known to have good internal consistency. Briere & Runtz[35] reported internal consistency of a $\alpha = 0.89$ for the TSC-33, while Krog & Duel[38] reported internal consistency of $\alpha = 0.92$, for the total scale TSC-23 and $\alpha = 0.82$ and $\alpha = 0.81$ for the subscales negative affectivity and somatization, respectively.

The TSC-33 and TSC-23 indicated that levels of psychological distress were gener-

Table 3. *Descriptive statistics for the scales. n = 26.*

	Mean baseline	Mean after the end of treatment	Mean at follow-up
HTQ-total (SD)	105.96 (7.88)	98.56(9.22)*	98.12(7.67)**
HTQ-re-experiencing (SD)	16.00 (0)	15.23 (1.27)	14.73 (1.66) **
HTQ- avoidance and numbing (SD)	27.80 (0.80)	22.46 (2.64)*	23.46 (3.07)**
HTQ- alertness (SD)	20.00 (0.00)	19.38(1.09)	19.15 (1.38)
TSC-23 total (SD)	82.80 (11.46)	73.46 (7.78)*	74.65 (10.65)**
TSC-23 negative affectivity (SD)	47.16 (6.59)	42.38 (4.94)*	43.34 (8.25)**
TSC-23 somatisation (SD)	35.61 (9.21)	31.00 (3.63)*	31.57 (3.57)
CSS-now (SD)	17.16 (4.86)	37.81 (3.69)* (***)	35.72 (5.09)**
CSS-then (SD)	15.91 (3.84)	15.69 (4.73)	16.20 (4.33)
GAF (SD)	40.38 (2.95)	46.61 (6.64)*	48.48 (7.60)**
TMT-A (SD)	31.08 (10.08)	26.46 (7.71)	26.88 (7.48)
TMT-B (SD)	59.62 (21.84)	46.52 (16.31)	45.84 (16.24)

*) significant change between baseline and the end of treatment at $p < 0.025$.
**) significant change between baseline and follow-up at $p < 0.025$.
***) significant change between the end of treatment and follow-up $p < 0.025$.
HTQ = Harvard Trauma Questionnaire; TSC-23= Trauma Symptom Checklist-23; CSS = Crisis Support Scale;
GAF = Global Assessment of Functioning; TMT = Trail Making Test part A & B.

Table 4. *Mean scores on the Harvard Trauma Questionnaire (HTQ). n = 26.*

	Baseline (SD)	Range baseline	End of treatment (SD)	Range at end of treatment	Follow-up (SD)	Range at follow-up
HTQ total	3.5 (0.26)	2.8-3.9	3.3 (0.31)	2.7-3.9	3.3 (0.26)	2.7-3.8
HTQ re-experiencing	4.0 (0)	4.0-4.0	3.9 (0.27)	3.3-4	3.8 (0.34)	3-4
HTQ avoidance	3.9 (0.11)	3.4-4.0	3.21 (0.38)	2.6-4	3.4 (0.44)	2.6-4.0
HTQ hypervigilance	4.0 (0)	4.0-4.0	3.9 (0.22)	3.2-4.0	3.8 (0.28)	3.0-4.0

Table 5. *Means on the TSC-33 and the TSC-23.*
n = 26.

	TSC-33	TSC-23
Baseline (SD)	115.26 (11.92)	82.80 (11.46)
End of treatment (SD)	104.44 (9.82)	73.46 (7.78)
Follow-up (SD)	103.63 (10.22)	74.65 (10.56)

ally high in the present research population. A comparison of scores on the TSC-33 and TSC-23 is to be found in Table 5. The means of 82.8 out of 92 possible on the total TSC-23 scale show that participants are scoring between 3 and 4 on most items indicating that symptoms are present "often" or "very often". This is also true for the two TSC-23 subscales.

Treatment effectiveness as assessed by the TSC-23

Decreases in psychological distress levels on the TSC-23 were observed following treatment as indicated by the Wilcoxon signed ranks test ($z = -3.7$, $p < 0.000$), with a large effect size ($r = 0.52$), pre-treatment Md = 82, post-treatment Md = 74.5. The effect was also observable at follow-up ($z = -2.8$,

p < 0.006, r = 0.38) and a Md = 72 at follow-up.

Amelioration of symptoms of depression and anxiety indicated by the negative-affectivity scale was evident between baseline and the end of treatment (z = –3.4, p < 0.001), with a medium effect size (r = 0.47), pre-treatment Md = 47, post-treatment Md = 42 as well as at follow-up (z = –2.7, p < 0.008, r = 0.37), and a Md = 41 at follow-up. This was also true for the somatisation-scale (z = –2.9, p < 0.004), with a medium effect size (r = 0.40), pre-treatment Md = 34, post-treatment Md = 30.5 and (z = –2.2, p < 0.03, r = 0.30, Md = 32) at follow-up. Thus, treatment seemed to ameliorate levels of overall psychological distress, including symptoms of anxiety, depression and somatic compliant. This presumed effect is somewhat smaller but still present at follow-up.

Levels of social support
as measured by the CSS-present and CSS-past
Cronbach's alpha values in the present study were also low for the CSS. Again, we suspect that this was due to the lack of variance in scores in the present sample. In a larger sample of 4,213 subjects Cronbach's alpha values for the entire CSS scale α = 0.82, with α = 0.75 for T1, and α = 0.67 for T2, have been reported.[50] In the current study mean inter-item correlations for present CSS was 0.15, with values ranging from –0.34 to 0.55. For the past CSS scale mean inter-item correlation were 0.16, values ranging from –0.19 to 0.63.

At baseline, the perceived levels of present support were generally low, with 89% of the participants reporting total scores under 28, indicating that they "almost never" had anyone to talk to about their problems, "no one showing sympathy and support" or "helping with practical things". At the end of treatment and follow-up 100%

had scores above 28, indicating at least moderate levels of perceived present social support. Scores on retrospective perceived levels of social support were low at base line (100% having scores under 28) and remained approximately at the same level at the end of treatment as well as at follow-up assessments.

Treatment effectiveness
as assessed by the CSS-present and CSS-past
Statistically significant increases occurred in participants' self-rated levels of present social support between the three assessment times (z = –4.3, p < 0.000), with a large effect size (r = 0.62), pre-treatment Md = 17, post-treatment Md = 39.5. Maintenance of effect was observed at follow-up (z = –4.1, p < 0.000, r = 0.59, Md = 38 at follow-up). There was a statistically significant decrease in scores on perceived social support between the end of treatment and follow-up (z = –2.3, p < 0.02, r = 0.33). No changes were found in participants' retrospective perceived levels of social support.

Screening for acquired brain damage
As already mentioned, five participants were excluded from the study, because their scores on the TMT and careful clinical interviews indicated the presence of brain damage. Of the participants included in the study three more (11.5%) had scores on the TMT A & B in the 10th percentile for their age groups at baseline. This cut-off is usually considered as indicative of brain injury.[42-45] At the time of second assessment and follow-up however, two of the participants had remarkably better scores, now in the normal range. Thus, only one participant's scores remained inside the critical cut-off of the 10th percentile, in spite of the effect of rehearsal on the test scores. In fact, for this person, the scores remained

exactly the same at all three assessment points, which might indicate presence of brain damage.

In the intake procedure, the TMT had successfully spotted a number of persons in need of further neuropsychological assessment, which is exactly what a screening measure should do. One person was possibly overlooked. As far as the two participants who managed to perform better on the test are concerned, their ability to learn and thus to do remarkably better at second and third assessment would imply absence of brain damage. Instead, it might be speculated that the prolonged task solution period at baseline might have been a result of misunderstanding of task instructions or some other aspect of the test situation itself.

Associations between scores on mental health measures
We suspected that participants who resettled in Denmark decades ago and were still symptomatic had very chronic PTSD and maybe also higher symptom levels than participants who have resettled more recently. Associations between years since the arrival in Denmark and total scores on the HTQ and TSC-23 were examined using the Chi-square statistic. Also associations between the levels of social support and the total scores on the HTQ and TSC-23 were examined to test a possible influence of social support on symptom levels. None of the associations gave significant results, possibly due to the small sample size and the general lack of variance in scores (scores were grouped at the high end of the assessment scales).

Discussion

Characteristics of the treatment population at the CTR
The main finding in this study is the very high levels of reported PTSD symptoms and general psychological distress in the patients at CTR in Holstebro. Means of 3.5 on the HTQ total score and 3.9 on the HTQ PTSD items found in this population are seemingly the highest scores reported in the research literature on refugees. Other reports on the HTQ PTSD items in refugee populations in treatment range from 2.42 to 2.95.[7,11,24,51-53] Kivling-Bodén & Sundbom[7] have reported a total score of 2.4 on the HTQ in a clinical population from the former Yugoslavia that was resettled in Sweden. The higher symptom level in the present population can be understood in terms of symptom chronicity, which is associated with symptom severity in untreated cases. If the number of years since resettlement are taken as an indication of years since traumatisation, and therefore an approximation of initial appearance of symptoms, the symptoms in the present population are much more chronic (meantime since resettlement 11.9 years (SD = 5.7)). The average number of years since resettlement in the Swedish population was 5.5 years at last follow-up. Keller et al[51] reported a mean of 2.42 on the 16 PTSD items on the HTQ in a culturally diverse clinical population treated in the USA. This is in comparison to a score of 3.9 in our population. Again, the levels of chronicity are not directly comparable to those in this population, since the American sample seems to consist of recently arrived refugees. All three samples seem to have experienced high levels of trauma exposure, but they are not directly comparable, because the sample in the Kivling-Bodén study was assessed by a version of HTQ with only 17 events, while

a 23-item version was used in the other two studies. A questionnaire with more options could probably serve as a help in prompting memory, and therefore result in reporting of more events. Carlsson et al[24] have also reported means of 2.7 for HTQ total and 2.93 for HTQ PTSD in a clinical population of refugees in multidisciplinary treatment in Denmark, very similar to the present. Common residence in Denmark means that both samples probably are exposed to some of the same post-migratory factors on the macro level (refugee legislation, asylum procedures, public opinions about refugees etc.). The samples are also comprised of individuals of approximately same age and composition of ethnic origin. It was not possible to compare the actual levels of trauma exposure in the samples because they were assessed and reported differently. Reports of higher symptom levels would be expected in the Carlsson et al.[24] sample because it is mainly comprised of tortured refugees.

The contra-intuitive presence of higher symptom levels in the present study population can be explained in two ways. First, our population was approximately half male half female, whereas the Carlsson et al[24] population was predominantly male. Women seem to be more likely to develop PTSD than men. Also, feelings of helplessness and emotional distress are more consonant with women's gender roles than men's.[54] This could suggest that women could be prone to report more symptoms of psychological distress then men. Secondly, the majority of the Carlsson et al.[24] sample has been resettled in Denmark for less than five years. Our sample has been resettled for about twice as long. This can have an effect on the perceived levels of social support and maintenance of positive attitudes toward one's own life situation. As long as the resettlement is a relatively new experience, hope for a better life and a better future in the new country can be maintained. But when the years in the new country have passed without much change in the life situation and psychiatric symptoms and other hardships of refugee life are still present, this hopeful attitude can be hard to hold on to. Also, the fact that the refugees in the present study are settled in small Danish provinces where there are not many fellow refugees can limit their access to important sources of social support.[23] This does not apply in the same sense to the tortured refugee sample from the RCT in Copenhagen. Social support probably has implications for the PTSD levels as will be discussed further on.

Assessment of global mental health through GAF showed low levels of global functioning which was in agreement with the very high symptom levels on the HTQ. Means of 57.3 and 59.1 have been reported in other clinical refugee populations.[55, 56] Wenzel et al.[56] reported a range in GAF scores between 45-80 (mean 59.1, SD 7.6) in a culturally diverse population of refugees in Austria. Lavik et al.[55] have reported a mean score on the GAF of 57.3 in a very large multicultural sample of refugees living in Norway. In comparison, the GAF scores in this present sample seem very low (range 36-59, mean at baseline 40.3), especially since the Austrian sample consisted exclusively of tortured refugees and a very large percentage of the Norwegian sample has been tortured too. What is not clear in the meantime is the level of chronicity of PTSD symptoms in the two comparison groups. The Austrian group seems to have arrived in Austria relatively recently, since many of the refugees are reported to have uncertain political status. Boehnleine et al[17] reported a range in scores on the GAF from 45-85 in their treatment population of highly chronic PTSD patients from South-East Asia. Fur-

thermore, they report that the group with the poorest treatment outcome after more than 10 years of continuous treatment had GAF scores between 45-60, a level of impairment which is very similar to the one of the present population, scoring between 36-59 at last follow-up.

Scores on the TSC-23 are also high in the present population. In severely traumatized populations like women who have been victims of incest since a young age with abuse going on for many years, mean scores of 76.7 are reported 57 compared to 82.8 in the present research population. The high levels of PTSD symptomatology on the HTQ, the high levels of anxiety, depression, and somatisation symptoms on the TSC-23, along with low levels of global functioning, paint a comprehensive picture of a highly symptomatic research population. Also, in comparison to similar populations in terms of multicultural sample composition and approximated traumatisation levels the symptom levels are very high in the present population. It is therefore worth considering if some bias inherent in the research design could unnaturally be elevating the levels of symptoms.

Reporting of symptoms through self-report measures is known to result in higher prevalence than found by clinical interviews.[10] The present research population was also assessed by SCAN diagnostic interviews at all three assessment times. HTQ algorithm method and SCAN interviews showed reasonably similar PTSD prevalence. 85% of the patients (by algorithm method) and 92% of the patients (by SCAN) were assessed to have PTSD at the end of treatment (all the patients had PTSD at intake since this is the criterion for being admitted to treatment). The small difference in diagnostic status between the two methods may also be caused by different diagnostic categories existing in

DSM-IV,[30] on which the HTQ algorithm method is based, and SCAN using ICD-10[27] classification. ICD-10 contains the category F62.0, which is a diagnostic category describing permanent personality change as a consequence of extreme traumatization. The DSM-IV[30] does not have an equivalent diagnostic category. The two patients (8%) recognised as having personality change with SCAN could be recognised as "ordinary" PTSD in the DSM-IV algorithm. The F62.0 (ICD-10)[27] and 309.81 Posttraumatic Stress Disorder (DSM-IV)[30] are different diagnostic categories but have an overlap in that they are both diagnosed following traumatic events (criterion A in both diagnostic categories). They also have an overlap in terms of their description of avoidance/numbing symptoms (criterion C in 309.81 and criterion B in F62.0) and symptoms of increased arousal (Criterion D in 309.81 and criterion B in F62.0). Also, F62.0 is often preceded by Posttraumatic Stress Disorder F.43.1 (ICD-10). Cut-off scores on the HTQ might have shown a slight overestimate because the prevalence of PTSD was estimated to be 100% at all times. Still, comparison of the checklist and clinical assessment methods implies that the high prevalence of PTSD in the present study population does not seem to be overestimated because of the use of self-report measures. See Table 6 for an overview of PTSD prevalence in the present population assessed by different methods.

Table 6. *Comparison of PTSD prevalence with different assessment methods. n = 26.*

	Baseline	End of treatment	Follow-up
SCAN-interview:			
– PTSD	100%	92%	92%
– F62.0		8%	8%
HTQ algorithm	100%	88.5%	96.2%
HTQ cut-off (>2.5)	100%	100%	100%

Asylum seeking patients are also suspected to exaggerate their symptom levels because high amounts of psychological distress due to persecution might ensure them asylum in the host countries. This is probably not the case in the present population since rehabilitation centres only treat refugees who have been granted asylum and most of our participants have been settled down in Denmark for decades. One possible reason for false inflation of symptoms could have been the fact that very few are offered treatment at the specialized rehabilitation centres. The participants could have felt that they had better chances of getting treated if they exaggerated their symptoms at intake. Furthermore, because of the shared care principles at the RCT the participants might have exaggerated their symptoms because this could lead to beneficial evaluations by the social workers, who were responsible for evaluation of their capacity to work.

Contrary to this, believable reasons for the very high levels of psychological distress observed in the present sample are the high levels of trauma exposure (see Table 2) and the duration of symptoms themselves. Because most of the participants have settled down in Denmark more than a decade ago, it can be suspected that at least an equal length of time has passed since the traumatizing events occurred. Also, in comparison to similar populations, the present seems to be one of the most chronic.

General tendencies in the Danish psychiatric system, such as reductions in the capacity to house hospitalised psychiatric patients, have meant that only the worst afflicted patients are represented in the hospitals' statistics. This effect might also be showing for the refugee PTSD patients. It is thus not unlikely that the treatment population at the Holstebro CTR is highly symptomatic of PTSD and other PTSD related symptoms (anxiety,

depression, and somatization), although the morbidity levels might be somewhat inflated.

Recent research into the role of symptoms of emotional numbing in PTSD suggests that emotional numbing often understood as loss of interest in activities, detachment from others and restricted range of affect might be seen as an individual factor in PTSD (as parallel in importance to re-experiencing, avoidance and arousal symptoms when it comes to describing PTSD).[58] Preliminary results indicate that presence of emotional numbing seems to characterise the most severe cases of prolonged PTSD with high trauma exposure.[58, 59] In these terms, the population at CTR may be indicative of emotional numbing. This population scoring almost maximum on many symptom scales may reflect this restriction in affect range. They could be unable to differentiate between the emotional states because they are so distressed that "everything may feel as distressing as everything else", explaining the lack of variance in scores. Further studies within this highly traumatized population are needed to specifically address the levels of emotional numbing and the role it might play in treatment outcomes.

Observations of treatment effectiveness

The other important finding of this study was that the multidisciplinary treatment offered at the CTR seems to show some effectiveness in ameliorating symptoms of PTSD in spite of the very high and presumably chronic morbidity levels. A medium effect ($r = 0.43$) was observed for the 16 HTQ PTSD symptoms. Large effect size ($r = 0.61$) was found for avoidance numbing symptoms, and a small effect size ($r = 0.24$) for re-experiencing symptoms. In a similarly chronic population of treatment resistant Vietnamese refugees, treated with culturally sensitive CBT, Hinton, Pham, Tran,

Otto, Safren, & Pollack[60] reported symptom reduction on the HTQ of a large effect size (Cohen's d = 2.5). Treatment studies in general have shown effect for both culturally sensitive and standard CBT.[60-66] A series of studies of narrative exposure therapy (NET), a combination of narrative and cognitive-exposure techniques, demonstrates that it elevates symptoms of PTSD, anxiety and depression in both clinical and community based settings with trained lay-counsellors from refugee camps acting as therapists to their co-refugees.[65, 66] Effectiveness of short term psychodynamic therapy (Cohen's d = 3) and testimony therapy has also been suggested through studies by Holmquist, Andersen, Anjum, & Alinder[67] and Weine, Kulenovic, Pavkovic, & Gibbons.[68] Although many different regiments show some effectiveness and statistically significant symptom reduction, a considerable number of patients do not reach the subclinical thresholds.[7, 24] The few available treatment outcome studies with an explicit focus on the long-term duration of treatment effects in refugees with PTSD, also point to the possibility that the treatment effects can be rather short term.[17, 69]

The effect sizes observed in this study are relatively small compared to the very large effect sizes found in some of the more methodologically rigorous trials of CBT.[60, 63-66] While multidisciplinary treatment, adhering to pain management and combining physiotherapeutic and social interventions with more traditional psychiatric methods of psychotherapy and medication intuitively seems appropriate for multi-traumatized refugees, better descriptions and more rigorous studies of effective elements of multidisciplinary treatment are needed to determine its applicability and relative cost effectiveness in treatment of refugees with PTSD. There were considerable shortcomings in the control of the treatment factors

in this study. The psychotherapeutic treatment was not manualized. This means that the use of specific techniques was mostly left to the individual therapist's personal preferences. As a result, three arbitrary participants received psychotherapy with elements of EMDR. It was in the mean time not possible to identify the specific cases in the data material. The possible influence of the EMDR on the treatment outcomes is therefore not controlled for. It follows, that the observed treatment effects can, because of the lack of control of therapeutic factors, equally well be attributed to the therapist's person as to the treatment in question. Also, no attempts to document and evaluate the specific effects of the other components in the multidisciplinary treatment (pharmacotherapy, physiotherapy, and social work efforts) were made. It has been argued that complex therapies, consisting of more effective factors, may require longer treatment periods for their many elements to come to their right.[70] This might very well be the case with multidisciplinary treatment. The all important question to be answered is, if these more complex and maybe longer, more expensive treatments, have longer and/or other, more generalized benefits than the standard cognitive behavioural therapies, which do show very large effect sizes in refugee populations as well.

Finally, less specific measures of PTSD symptomatology covering states often occurring with PTSD were also included in the study. Here, medium effect sizes were observed for the TSC-23 scale, covering symptoms of depression, anxiety, and somatization, and a large effect size for improvement on the GAF. Thus it seems that the multidisciplinary treatment at CTR in Holstebro demonstrated differing sizes of effectiveness but overall signs of effectiveness on a number of different measures in spite

of the small sample size (n = 26). This is encouraging taking into consideration the state of the patients. Furthermore the effect generally seemed to be lasting at the six month follow-up, although it was somewhat smaller than at the end of treatment.

The clinical significance of the observed outcomes
While the statistically significant results are interesting, the clinical implications of the treatment effectiveness are less encouraging. Results of the SCAN-interviews, where 92% of the patients were diagnosed with PTSD at follow-up, and 8% had received a diagnosis of chronic personality change after a course of PTSD (F62.0) are showing no clinically significant improvement. DSM-IV algorithm showed 96% PTSD prevalence at follow-up (see table 5 for details). Thus, according to our most optimistic estimate only 3-4% of the patients (corresponding approximately to one patient) had moved below the clinical threshold for PTSD. This means that the level of symptoms remained high in the population in spite of the statistically significant results showing symptom improvement.

Finally, the clinical implications of the statistical treatment effects are not sufficiently explored in this study because a broad measure assessing the impact of the treatment on the patients every day function was not included. A measure of global mental health, which assesses some aspects of every day functioning, was included. What seems to be missing is the subjective evaluation of the level of impairment from the sufferer's perspective. Furthermore, it is also important to recognise that in populations with different ethnic backgrounds, culture probably plays a role in modulating the personal perceptions of disability according to the salience of specific social roles in the culture in question. Sack et al,[15] referring to the before mentioned series of longitudinal

studies on traumatized Cambodian youth, conclude that high levels of PTSD symptoms do not necessarily mean high levels of disability since many of the young Cambodians managed to get collage degrees, had well paid jobs and functioned in family entities in spite of their symptoms. Also, since chronic PTSD seems to be periodic and long lasting for a fraction of highly symptomatic patients[6, 13-16] such as ours, it cannot be hoped that they ever will be entirely asymptomatic. More subjective measures of well-being could therefore be valuable in detecting the smaller changes in patients as they learn to live with their symptoms. Further studies of patient populations in rehabilitation centres are needed to establish levels of functional and subjectively perceived disability co-occurring with high and chronic PTSD symptom levels.

A measure included in this study, which may be indicative of the treatment's effect on broader life domains, and therefore may be linked to the clinical significance of the outcomes, was the Crisis Support Scale. The results indicate that the treatment condition might have had some effect on increasing levels of present social support. Since the effect seems to be lasting even after the end of treatment, this might indicate that the increases in participant's perceived social support are not only due to time spent with the treatment personnel at the CTR which might be an important source of social contact for patients with severe PTSD who easily become socially isolated. We speculate that the slight decrease in social support scores between the end of treatment and follow-up was due to precisely this reason – the patients losing the supportive contact to the professionals after the end of treatment. The lack of change in past social support following treatment may be explained if past social support was not discussed in treatment

and the focus was on discussion and reappraisal of sources of present social support. Furthermore, no significant correlation was found between CSS-present and CSS-past scales at any point of assessment.

The mechanism behind this co-occurrence of improved levels of present social support following treatment is not fully illuminated in the study. Thus, we do not know precisely what might have caused the elevation of levels of perceived social support and even less about how this effect may have been mediated. Associations between perceived social support and levels of PTSD symptomatology have traditionally been conceptualised as the former having a buffering effect on the latter so that more social support at the time of crisis results in less PTSD. This conceptualisation is supported by the research literature,[39-41, 50] but was not observed in this research population.

Kaniasty & Norris[39] have recently suggested that different mechanisms of social support are linked to different phases of PTSD. The social causation mechanism (more social support leading to less PTSD) turned out to be most salient in the initial phases of PTSD (6-12 months after the occurrence of the disaster); in the period from 12-18 months after the disaster a mechanism of social selection (more PTSD leading to less social support) was salient along with the social causation mechanism, while social selection alone occurred after 18-24 months following the disaster. Even though the research population in the cited study consists of Mexican survivors of a natural disaster, common social mechanisms such as social selection can be assumed to operate when normal/adaptive reactions to traumatization turn into more chronic forms of the same, thus becoming psychopathological. This could explain the lack of association between social support and PTSD symptoms in the present, highly chronic population, where mechanisms of social selection presumably are the most salient. Rehabilitation efforts concentrating on counteracting processes of social selection and supporting processes of social support are recommended. In relation to this, Schweizer at al[40] have found that perceived social support from the refugees' own community predicts the symptoms of PTSD while perceived social support from society as a whole does not play as important a role in the prediction of PTSD symptomatology. This observation is of importance for the present study population, which is settled in provincial areas where there are not many fellow refugees. Danish governmental settlement policies are aimed at dispersion of refugees throughout the country, which is meant to be beneficial for integration.

The utility of the TMT A & B in refugee populations

The use of cognitive tests which are specific for the Western part of the world are generally not advised in other cultures without verification of their applicability. Maj et al[71] have demonstrated that TMT A is virtually culturally universal, while the TMT B which relies on the use of the Latin alphabet can be assumed to have limited application with individuals who are dyslexic, illiterate, or poorly educated, and are not native users of the written Latin alphabet. Although the TMT B was translated to the native languages of the study participants, several of the other characteristics could easily apply to the present study population. It is therefore remarkable that the majority completed both parts of the test within the standard western norms. Generalizations on the TMT's value as a screening instrument for acquired brain damage in refugee populations are premature on grounds of this small study. Five

possible study participants were referred to other types of treatment because of suspicion of acquired brain damage (ABD). The suspicion was confirmed by further assessment. This might indicate that the TMT A & B has some value in detecting possible cases of acquired brain damage at an early stage in the assessment of refugee patients' mental health. It is not possible to say anything conclusive about presence or absence of ABD in the one patient detected through subsequent analyses, because no other data that could illuminate this question were available. Only two participants seem to have had some trouble in understanding the test requirements, which does not seem as high a percentage considering the sample's diversified cultural background, and the before mentioned limitations in use with non-western populations.

Finally, it is important to recognise that the use of TMT A & B with refugees suffering from chronic PTSD creates many uncertainties about the interpretation of the results. Most importantly, the test itself is not specific. Its sensitivity to conditions of general cognitive dysfunction means that it can be tapping into cognitive impairments, which are suspected to accompany chronic PTSD[48, 49] and are by definition not cases of TBI. Therefore, the underlying cause of the cognitive impairment remains unknown, as well as the possibility that the observed cognitive dysfunction can be reversed by elevation of PTSD symptoms. The value of the application of the TMT in such populations therefore rests on its ability to bring to attention TBI as a possible factor in the explanation of the patient's difficulties. The possibility of TBI in refugee PTSD patients is often overlooked, and can easily be masked by language and cultural differences which are creating a barrier between the professionals and the patients. Maj et

al[71] have also reported results on a variant of the TMT developed for cross-cultural use, where utilization is not dependant on the knowledge of the Latin language standards. Further analyses of the TMT's applicability in refugee populations are recommended.

Limitations

The study population was small and not randomized. It is thus not representative of the refugee PTSD populations in general. Also, the baseline data on three participants without complete data set and three participants that dropped out of treatment (19% of the research population) went missing in the CTR archives. Analyses of possible differences in baseline scores between this part of the research population and the part that was included in the final statistical analyses could therefore not be performed.

Because of the possibility of specific socio-political circumstances in the referral system in this part of the country as well as professional traditions operating at the CTR, the specific treatment circumstances and procedures could have played a role in the final results. The statistical make up of the data unfortunately did not permit more rigorous statistical analyses and exploring of associations between the different measures of mental health. The low Cronbach's alphas might have been due to insufficient translations of the instruments, such that the same items could have had slightly different meanings in different languages.

Finally, a control group was not included in the study design, but the fact that the patient's PTSD symptoms have been persistent for decades makes it unlikely that the treatment effects found are merely due to natural remission. It is also not possible to disentangle treatment effects due to different treatment components, such as psychotherapy, physiotherapy or medical therapy.

Similarly, it is also likely that patients from different cultures could have responded differently to the treatment due to cultural and language differences (e.g. differing access to education, and culturally specific ideas about appropriate treatment for mental illness), but this effect could not be explored because of the very small sample size. An explorative study design that was as close as possible to the natural practices at the CTR was strived for, making the study itself less adherent to more rigorous research recommendations.

Conclusions

The study confirmed the clinical observations of very high levels of psychological distress in the patient population at the CTR in Holstebro. Statistically significant improvement was observed on most symptom measures following treatment. Clinical implications of these statistically inferred improvements seemed much smaller and less clear. Measures of improvement in subjective well-being are recommended in such highly chronic patients with little hope of full symptom recovery. The evaluation of the relative effectiveness of multidisciplinary treatment compared to other treatments for refugees with PTSD calls for further exploration of specific effective factors in multidisciplinary treatment as well as composition and duration of such complex treatment efforts.

Finally, high levels of symptoms of PTSD, depression and anxiety were persistent in patients up to 24 years after resettlement in Denmark. This makes it necessary to point out that receiving countries are obliged by UN treaties to rehabilitate victims of torture and mass violence. Numerous studies show that it is not enough to provide traumatized refugees with safe surroundings and the assurance of basic needs. Refugees are met with challenges of acculturation and various sources of post-migration stressors upon their arrival in host countries. Disability caused by severe trauma does not go away with time; furthermore it hinders successful social adaptation and integration into the new society. Effective national treatment systems for traumatized refugees are therefore a good investment for the future. In taking care of mental health and social problems before they get out of control and more costly on the national level, the programmes, more importantly, are also a resource for reducing human suffering.

References
1. Asylum levels and trends in industrialized countries. First half 2008. Statistical overview of asylum applications lodged in 38 European and 6 Non-European countries. UNHCR, UN Refugee Agency, 2008. http://unhcr.org./statisticks.html (February 06, 2009).
2. UNHCR statistical yearbook. UNHCR, 2007. hhtp://unhcr.org./statisticks.html (February 06, 2009).
3. Lund M, Sørensen JH, Christensen JB et al. MTV om behandling og rehabilitering af PTSD – herunder traumatiserede flygtninge. Region Syddanmark, Center for Kvalitet, 2008: 9-375.
4. Keyes EF. Mental health status in refugees: an integrative review of current research. Issues Ment Health Nurs 2000;2:397-410.
5. Silove D. The psychological effects of torture, mass human rights violations, and refugee trauma: toward an integrated conceptual framework. J Nerv Ment Dis 1999;187:200-7.
6. Kinzie DJ. Immigrants and refugees: the psychiatric perspective. Transcult Psychiatry 2006;4:577-91.
7. Kivling-Bodén G, Sundbom E. Life situation and posttraumatic symptoms: a follow-up study of refugees from the former Yugoslavia living in Sweeden. Nord J Psychiatry 2001;55:401-8.
8. Carlsson JM, Olsen D, Mortensen E et al. Mental health and health-related quality of life. A 10-year follow-up of tortured refugees. J Nerv Ment Dis 2006;194:725-31.
9. Gerritsen AM, Bramsen I, Devillé W et al. Physical and mental health of Afghan, Iranian and Somali asylum seekers and refugees living in the Netherlands. Soc Psychiatry Psychiatr Epidemiol 2006;41:18-26.

10. Johnson H, Thompson A. The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: a review. Clin Psychol Rev 2006;28:36-47.

11. Carlsson JM, Mortensen E, Kastrup M. Predictors of mental health and quality of life in male tortured refugees. Nord J Psychiatry 2006;60:51-7.

12. Fazel M, Wheeler J, Danesh J. Prevalence of serious mental disorder in 7,000 refugees resettled in western countries: a systematic review. Lancet 2005;365:1309-14.

13. Marshall G, Schell T, Elliott M et al. Mental health of Cambodian refugees two decades after resettlement in The United States. JAMA 2005;294:571-9.

14. Joffe C, Brodaty H, Luscombe G et al. The Sydney Holocaust Study: posttraumatic stress disorder and other psychosocial morbidity in an aged community sample. J Trauma Stress 2003;16:39-47.

15. Sack WH, Him C, Dickason D. Twelve-year follow-up study of Khmer youths who suffered massive war trauma as children. Journal of American Academy of Child and Adolescent Psychiatry 1999;38:1173-9.

16. Kinzie DJ, Boehnlein JK, Riley C et al. The effects of September 11 on traumatized refugees: reactivation of posttraumatic stress disorder. J Nerv Ment Dis 2002;190:437-41.

17. Boehnlein JK, Kinzie D, Sekiya U et al. A ten-year treatment outcome study of traumatized Cambodian refugees. J Nerv Ment Dis 2004;192:658-63.

18. Birck A. Torture victims after psychotherapy – a two-year follow-up. Torture 2001;1:55-8.

19. Elklit A, Nørregaard J, Tibor B. Forekomst af traumatiserende begivenheder hos unge bosniske flygtninge i Danmark. Ugeskr Læger 1998;160:4310-4.

20. Abdalla K, Elklit A. A nationwide screening survey of refugee children from Kosovo. Torture 2001;11:45-9.

21. Abdalla K, Elklit A. En landsdækkende screeningundersøgelse af flygtningebørn fra Kosovo. Psykologisk Pædagogisk Rådgivning 2001;38:339-48.

22. Schwarz-Nielsen KH, Elklit A. An evaluation of the mental status of rejected asylum seekers in two Danish asylum centres. Torture 2009;19:51-9.

23. Elklit A, Einarsdóttir T. PTSD og sociale problemer hos torturerede flygtninge i Danmark. Psykolog Nyt 2003;57:22-5.

24. Carlsson JM, Mortensen EL, Kastrup M. A follow-up study of mental health and health-related quality of life in tortured refugees in multidisciplinary treatment. J Nerv Ment Dis 2005;193:651-7.

25. Weinstein CS, Fucetola R, Mollica R. Neuropsychological issues in the assessment of refugees and victims of mass violence. Neuropsychol Rev 2001;11:131-41.

26. Mollica R, Henderson DC, Tor S. Psychiatric effects of traumatic brain injury events in Cambodian survivors of mass violence. Br J Psychiatry 2002;181:339-47.

27. The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Description and Diagnostic Guidelines. Geneva: World Health Organization, 1992.

28. Herman JL. Trauma and recovery. New York: Basic Books, 1992.

29. SCAN Schedules for Clinical Assessment in Neuropsychiatry, version 2.1. Geneva: World Health Organization, 1999.

30. Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR. Washington D.C.: American Psychiatric Association, 2000.

31. Mollica RF, Caspi-Yavin Y, Lavelle J et al. The Harvard Trauma Questionnaire (HTQ). Manual. Cambodian, Laotian and Vietnamese Versions. Torture 1996 (Suppl); 22-33.

32. Mollica RF, McDonald L, Massagli M et al. Measuring trauma, measuring torture: instructions and guidance on the utilization of the Harvard Program in Refugee Trauma's Versions of the Hopkins Symptom Checklist-25 (HSCL-25) and the Harvard Trauma Questionnaire (HTQ). Cambridge, MA: Harvard Program in Refugee Trauma, 2004.

33. Fawzi S, Murphy E, Pham T et al. The validity of screening for post-traumatic stress disorder and major depression among Vietnamese former political prisoners. Acta Psychiatr Scand 1997;95:87-93.

34. Ichikawa M, Nakahara S, Wakai S. Cross-cultural use of the predetermined scale cutoff points in refugee mental health research. Soc Psychiatry Psychiatr Epidemiol 2006;41:248-50.

35. Briere J, Runtz M. The Trauma Symptom Checklist (TSC-33). Early data on a new scale. J Interpers Violence 1989;4:151-63.

36. Elklit A. Måling af belastninger efter voldeligt overfald med TSC-33 (traume symptom checkliste). Nordisk Psykologi 1990;4:281-9.

37. Derogatis LR. An out-patient psychiatric rating Scale – preliminary report. Psycho-pharmacol Bull 1973;9:13-28.

38. Krog T, Duel M. Traume Symptom Checkliste (TSC). En validering og revidering. Psykologisk Studieskriftserie 2003;6.

39. Kaniasty K, Norris FH. Longitudinal linkages between perceived social support and posttraumatic stress symptoms: sequential roles of social causation and social selection. J Trauma Stress 2008;21:274-81.

40. Schweizer R, Melville F, Steel Z et al. Trauma, post-migration living difficulties, and social support as predictors of psychological adjustment in resettled Sudanese refugees. Aust N Z J Psychiatry 2006;40:179-87.

41. Joseph S, Andrews B, Williams R et al. Crisis support and psychiatric symptomathology in adult survivors of the Jupiter cruise ship disaster. Br J Clin Psychol 1992;31:63-73.

42. Elkilit A. Om anvendelse af Trail Making Test (TMT) som et neuropsykologisk screeningsinstrument. Nordisk Psykologi 1992;3:234-6.

43. Nielsen H, Lolk A, Kragh-Sørensen P. Normative data for eight neuropsychological tests, gathered from a random sample of Danes aged 64 to 83 years. Nordisk Psykologi 1995;4:241-55.

44. Reitan RM. Validity of the trail taking test as an indicator of organic brain damage. Perceptual and Motor Skills 1985;8:271-6.

45. Sterne DM. The Hooper Visual Organization Test and the Trail Making Test as discriminants of brain injury. J Clin Psychol 1973;29:212-213.

46. Bögner D, Herlihy J, Brewin CR. Impact of sexual violence on disclosure during home office interviews. Br J Psychiatry 2007;191:75-81.

47. Mollica RF, Caridad CR, Massagli MP. Longitudinal study of posttraumatic stress disorder, depression, and changes in traumatic memories over time in Bosnian refugees. J Nerv Ment Dis 2007;195:572-9.

48. Emdad R, Söndergaard HP, Theorell T. Learning problems, impaired short-term memory, and general intelligence in relation to severity and duration of disease in posttraumatic stress disorder patients. Stress, Trauma, and Crisis 2005;8:25-43.

49. Johnsen GE, Kanagaratnam P, Asbjørnsen AE. Memory impairments in posttraumatic stress disorder are related to depression. J Anxiety Disord 2008;22:464-74.

50. Elkilit A, Pedersen S, Jind L. The Crisis Support Scale: psychometric qualities and further validation. Personality and individual differences 1990;31:1291-302.

51. Keller A, Lhewa D, Rosenfeld B et al. Traumatic experiences and psychological distress in an urban refugee population seeking treatment services. J Nerv Ment Dis 2006;194:188-94.

52. Roth G, Ekblad S, Ågren H. A longitudinal study of PTSD in a sample of adult mass-evacuated Kosovars, some of whom returned to their home country. Eur Psychiatry 2006; 21:152-9.

53. Kleijn WC, Hovens JE, Rodenburg JJ. Posttraumatic stress symptoms in refugees: assessments with the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist-25 in different languages. Psychological Reports 2001;88:527-32.

54. Lavik NJ, Hauff D, Skrondahl A et al. Mental disorder among refugees and the impact of persecution and exile: some findings from an out-patient population. Br J Psychiatry 1996;169:726-32.

55. Wenzel T, Griengl H, Stompe T et al. Psychological disorders in survivors of torture: exhaustion, impairment and depression. Psychopathology 2000;33:292-6.

56. Elklit A. Følger af incest – en beskrivelse af en gruppe incestofre i behandling. Odense: Incestcenter Fyn, 2000.

57. Kimerling R, Ouimette P, Weitlauf JC. Gender issues in PTSD. In: Friedman MJ, Keane TM, Resick PA, eds. Handbook of PTSD. Science and practice. New York: Guilford Press, 2007:207-27.

58. Bach ME. En empirisk belysning og analyse af »emotional numbing« som eventuel selvstændig faktor i PTSD. Psykologisk Studieskriftserie 2003;(6).

59. Feeney NC, Zoellner LA, Fitzgibbons LA et al. Exploring the roles of emotional numbing, depression, and dissociation in PTSD. J Trauma Stress 2000;13:489-98.

60. Hinton DE, Pham T, Tran M et al. CBT for Vietnamese refugees with treatment-resistant PTSD and panic attacks: a pilot study. J Trauma Stress 2004;17:429-33.

61. D'Ardenne P, Ruaro L, Cestari L et al. Does interpreter- mediated CBT with traumatized refugee people work? A comparison of patient outcomes in East London. Behav Cogn Psychother 2007;35:293-301.

62. Schulz PM, Resick PA, Huber LC et al. The effectiveness of cognitive processing therapy for PTSD with refugees in a community setting. Cogn Behav Pract 2006;13:322-31.

63. Paunovic N, Öst LG. Cognitive-behaviour therapy vs. exposure therapy in the treatment of PTSD in refugees. Behav Res Ther 2001;39:1183-97.

64. Hinton DE, Chhean D, Pich V et al. A randomized controlled trial of cognitive-behaviour therapy for Cambodian refugees with treatment-

resistant PTSD and panic attacks: a cross-over design. J Trauma Stress 2005;18:617-29.

65. Neuner F, Schauer M, Klaschik C et al. A comparison of narrative exposure therapy, supportive counselling, and psychoeducation for treating posttraumatic stress disorder in an African refugee settlement. J Consult Clin Psychol 2004;72:579-87.

66. Neuner F, Onyut PL, Ertl V et al. Treatment of posttraumatic stress disorder by trained lay counsellors in an African refugee settlement: a randomized controlled trial. J Consult Clin Psychol 2008;76:686-94.

67. Holmquist R, Andersen K, Anjum T et al. Change in self-image and PTSD symptoms in short term therapies with traumatized refugees. Psychoanalytic Psychotherapy 2006;20:251-65.

68. Weine SM, Kulenovic AD, Pavkovic I et al. Testimony psychotherapy in Bosnian refugees: a pilot study. Am J Psychiatry 1998;155:1720-6.

69. Hougaard E. Psykoterapi teori og forskning. Copenhagen: Dansk Psykologisk Forlag, 2004.

70. Drozdek B. Follow-up study of concentration camp survivors from Bosnia- Herzegovina: three years later. J Nerv Ment Dis 1997;185:690-4.

71. Maj M, Satz P, Janssen R et al. WHO Neuropsychiatric Study, Cross-Sectional Phase II: Neuropsychological and Neurological Findings. Arch Gen Psychiatry 1994;51:51-61.