

Symptoms, Quality of Life and level of functioning of traumatized refugees at Psychiatric Trauma Clinic in Copenhagen

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Abstract

Objective: To characterize physical and mental health in trauma exposed refugees by describing a population of patients with regard to background, mental health history and current health problems; and to identify pre- and post-migratory predictors of mental health.

Method: All patients receiving treatment at the Psychiatric Trauma Clinic for Refugees in Copenhagen from April 2008 to February 2010 completed self-rating inventories on symptoms of PTSD, depression and anxiety as well as level of functioning and quality of life before treatment. Then, associations of pre and post-migratory factors with mental health were explored using linear and logistic regression and Pearson's correlation coefficients.

Results: Among the patients, the prevalence of depression, somatic disease, pain, psychotic symptoms co-existing with PTSD and very low level of functioning was high. Persecution, being an ex-combatant and living currently in social isolation were significantly associated with PTSD arousal symptoms and self-reported pain.

Conclusions: New treatment modalities should seek to address all of the symptoms and challenges of the patients including psychotic and somatic symptoms and social isolation, and studies of treatment effect should clarify all co-morbidities so that comparable populations can be included in treatment evaluation studies.

Keywords: PTSD, refugee, war, co-morbidities

Introduction & Background

High co-morbidity of depression and PTSD in traumatized refugees is well-documented and it is generally accepted that there is a high prevalence of chronic pain in patients with PTSD and depression.^{1,2} In Denmark, studies of refugee populations have reported a similar high prevalence of depression, PTSD and pain.^{3,4} Although not as well-described, there are studies which have investigated somatic symptoms in traumatized refugees^{5,6} and a few studies have analyzed associations among depression, pain, PTSD and somatic symptoms.^{7,8} Finally, reports on traumatized refugees without psychosis or bipolar disorder, but with psychotic symptoms as a complication to PTSD and depression have been published.^{9,10} This has also been observed in other traumatized populations and has led to a debate about the existence of a psychotic subtype of PTSD although the evidence so far is

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inconclusive.^{11, 12} In spite of these findings, previous trauma and current physical and mental health conditions have often been insufficiently characterized with most trials focusing only on PTSD or using this as the main inclusion criteria and outcome measure.

Studies of pre- and post-migratory predictors of mental health in migrant and refugee populations are also relatively few and in general studies of traumatized refugees differ substantially with regard to the study population. Some studies include patients who have stayed in their new country of residence for decades while others include patients still awaiting clarification of their legal status as refugees. Furthermore, the population samples are culturally very diverse covering South Asia, Africa and the Middle East.^{3, 13-18} The association between PTSD, depression and pre-migratory trauma is well-established,¹⁹⁻²¹ but it is clear that the association depends on the pre-migratory context and on age and sex. In most outcome studies, the social situation of patients (legal status, housing, income, employment etc.) is often only summarily described, although post-migratory stressors seem to be strongly associated with poor mental health in immigrants. Numerous studies of the influence of post-migratory stressors and protective factors on PTSD and depression have been undertaken,^{22, 23} but they differ widely in the study population, outcome measures and ways of assessing predictors. Most predictor studies have come from North America where social welfare and health services are organized differently than in Scandinavia.

The purpose of this study was therefore 1) to further characterize physical and mental health in trauma exposed refugees by describing a population of patients referred to a psychiatric trauma clinic for refugees with regard to background, mental health

history and current health psychiatric and physical problems; and 2) to identify pre- and post-migratory predictors of the patients' mental health condition. The hypothesis was that traumatized refugees suffering from classical trauma-related conditions such as PTSD and depression suffer from several other co-morbidities, including functional disorders and somatic disease. Additionally, we expected to find a proportion of patients showing psychotic symptoms without meeting ICD-10 criteria for psychotic disorder and expected to be able to demonstrate relationships between pre- and post-migratory risk factors and the current mental health condition, quality of life and level of functioning of the patients.

Methods

Participants

During the period April 2008 – June 2009 166 patients were screened at the Psychiatric Trauma Clinic for Refugees. Inclusion and exclusion criteria for the study were:

1. A diagnosis of either PTSD or depression according to ICD-10 (F43.1 & F32-33);
2. More than 18 years old;
3. A history of war-related trauma or persecution;
4. Were in Denmark based on political asylum or family reunification. None of the participants were asylum seekers with their political status pending;
5. No current alcohol or drug-dependency according to ICD-10 (cannabis, cocaine, hallucinogens or opioids F1x.2);
6. No diagnosis of psychosis (any F20-F29 or F31 diagnosis according to ICD-10);
7. Not fulfilling the criteria for psychiatric hospitalization.

Of the 166 patients only 149 had inclusion diagnoses and of these 22 had an exclusion diagnosis (point 5 and 6 above), including seven patients with a diagnosis of

psychosis. The final sample comprised 127 adult patients. Diagnoses were made according to ICD-10 research criteria.

Data collection

The study is based on the results of the initial assessment interviews of patients before a six-month course of treatment. Data collected during the interview included self-ratings, clinical assessment of psychiatric symptoms based on ICD-10 and a semi-structured interview focusing on pre- and post-migratory predictors. Diagnoses were made according to the ICD-10 research criteria by medical doctors with psychiatric experience. Specifically, all diagnostic criteria for depression and PTSD were entered in diagnostic algorithms. Information about psychotic symptoms was based on information from the patient chart during treatment in addition to the assessment made by the medical doctor at the first interview in the clinic. Psychotic symptoms included hallucinations on all sensory modalities and delusions. Symptoms were only included if they were judged not to be trauma-related. All patients with a cluster of psychotic symptoms meeting a psychotic diagnosis were excluded from the study. Somatic symptoms reported at assessment were compared to self-reported pharmacological treatment. If a patient reported a symptom, but did not receive medical treatment for it, it was categorized as “untreated somatic complaint”, whereas somatic symptoms with corresponding treatment was categorized as “treated somatic complaint”. Information on trauma including torture was obtained by asking the patients directly about a number of pre- and post-migratory factors. Information about somatic complaints, current and previous mental health as well as psychiatric treatment was obtained from the patient, but in

some cases supplemented with information from the letter of referral to the clinic.

The self-ratings included PTSD symptoms (Harvard Trauma Questionnaire), depression and anxiety symptoms (Hopkins Symptom Checklist-25), quality of life (WHO-5) and the level of functioning (Sheehan Disability Scale). The Hopkins Symptom Check List-25 (HSCL-25) and the Harvard Trauma Questionnaire (HTQ) are internationally used and validated self-report rating scales.²⁴⁻²⁶ HSCL-25 is a shorter version of the Symptom Checklist-90 with a focus on anxiety and depression symptoms. HTQ is used to evaluate PTSD. We used the first 16 questions of the symptom part (Part IV) of HTQ, which are used to evaluate the PTSD-diagnosis according to the ICD-10 and DSM-IV diagnostic systems. Both HSCL-25 and HTQ have mainly been used on refugees and torture victims and have been validated in a variety of refugee populations.²⁷ For both scales, individual questions have an 1-4 Likert format with four being the highest symptom level. The cut-off value for PTSD on HTQ is 2.5 and for depression and anxiety on HSCL-25 1.75 across cultures, although these rating scales are not diagnostic instruments, but are primarily designed to assess symptom severity. To assess quality of life we used the WHO-5 scale, which is a widely used self-administered questionnaire with five questions (0-5 six point Likert scale with 0 being the lowest score and 5 the highest). The theoretical raw score ranges from 0 to 25 and is transformed into a scale from 0 (worst thinkable well-being) to 100 (best thinkable well-being). Thus, higher scores mean better well-being.²⁸ The Sheehan Disability Scale (SDS) is a self-report rating scale, which assesses the level of functioning in terms of family, work and social network by using three visual analogue scales from

1-10 with 10 being the lowest possible level of functioning. The score is usually reported as the total score of the three scales ranging from 1-30. The scale has been validated for a variety of psychiatric diagnoses and cultural groups.²⁹ All self-report questionnaires were available in validated versions of the six most common languages at the clinic (Arabic, Farsi, Bosnian / Serbo-Croatian, Russian, Danish and English), which included the language of 86% of patients.

Statistical analysis

In addition to descriptive statistics, linear regression analysis was used to investigate possible associations between individual diagnostic categories, initial scores on WHO-5, HTQ, SDS and HSCL-25 before treatment and indicators of trauma history, previous psychiatric history, co-morbidity and socioeconomic indicators. We included a number of pre-migratory and post-migratory factors in the regression models, as listed in Table 1: First, associations between outcomes and predictors were tested individually in linear regression models. Afterwards, variables that were found to be significantly associated with outcome measures were all included in multivariate regression models. Associations between various co-morbid diagnoses and self-ratings were examined with Pearson's correlations and students' t-test. In all analysis a significance level of 0.05 was used.

Results

Background

Demography

Men and women were almost equally represented in the sample (54 % women and 46% men) and the mean age at inclusion was 42.5 years. The majority of patients were from the Middle East with 41% of the study population from Iraq and substantial

proportions of Iranians (9%), Afghans (9%) and Palestinians (13%). Patients from Bosnia, Croatia and Serbia were also well represented. The sample is largely similar to the immigration patterns to Denmark in terms of ethnicity. Half of the patients spoke Arabic and half of the patients needed a translator (see Table 1).

Trauma

The majority of patients had experienced war and persecution reflecting the inclusion criteria of the study, but only 25% of the patients had been active participants in combat or stayed in a refugee camp before coming to Denmark. About half of the patients reported imprisonment and torture. In the study sample 71% of patients had spent time in an asylum centre and of these 76% had been in the asylum centre for more than six months. The mean number of trauma suffered was 3.8 of a maximum of 7.

Priors mental health and treatment

The mean number of years since the first trauma was 22 and the mean number of years in Denmark 14, which suggests that the mental health problems of the patients were chronic or had gotten worse after they have arrived in Denmark. A total of 36% of patients reported mental health problems before the trauma. The majority of patients (84%) reported having received drug- or psychotherapy or had been hospitalized for their trauma-related disorder before the assessment at the clinic and 70% had received psychopharmacological treatment before the assessment. Most received antidepressants (60%), but a third of the patients were prescribed benzodiazepines and 18% antipsychotics. Only three patients (3%) were treated with mood stabilizers (see Table 1).

Table 1: Description of the study population and distribution of predictors

Description of patient population (N=127 patients in total)			
	Mean (s)	Mean (s)	Mean (s)
Mean no. Of years in DK	14.3 (6.1)	15.0 (7.3)	13.7 (5.0)
Age	42.5 (8.0)	42.8 (8.5)	32.3 (7.5)
Mean no. Of years since first trauma	22.1 (9.0)	23.3 (9.4)	21.3 (8.7)
Trauma	All N (%)	Female N (%)	Male N (%)
Experienced war	110 (87)	49 (84)	61 (90)
Been a soldier*	30 (25)	28 (54)	2 (3)
Been persecuted	92 (78)	44 (85)	48 (73)
Lived in a refugee camp abroad	26 (25)	12 (29)	14 (23)
Been in prison*	72 (58)	48 (83)	24 (36)
Been subjected to torture	63 (50)	34 (58)	29 (43)
Been politically active*	25 (28)	18 (45)	7 (14)
Lived in asylum centre in Denmark*	62 (71)	36 (90)	26 (55)
Mental Health			
PTSD	109 (86)	50 (85)	59 (87)
Depression (moderate or severe)	120 (94)	57 (97)	63 (93)
Both PTSD and depression	105 (83)	48 (81)	57 (84)
Pain	122 (99)	57 (97)	65 (96)
Headache	117 (94)	53 (90)	64 (97)
Back pain	111 (91)	51 (88)	60 (94)
Pain in arms	96 (78)	43 (75)	53 (80)
Pain in legs*	100 (81)	43 (74)	57 (88)
Previous mental health			
Reports no mental health problems before trauma	75 (64)	34 (62)	41 (66)
Reports psychotic symptoms, treatment or diagnosis at assessment	32 (25)	16 (27)	16 (24)
Assessed psychotic during treatment	18 (16)	6 (12)	12 (20)
Previous addiction*	15 (12)	12 (20)	3 (4)
Previous psychiatric treatment	107 (84)	47 (80)	60 (88)
Previous psychopharmacological treatment	96 (76)	44 (75)	52 (76)
Antidepressants	67 (60)	27 (54)	40 (65)
Antipsychotics	23 (18)	9 (15)	14 (21)
Benzodiazepines	35 (31)	16 (32)	19 (31)
Mood stabilizers	3 (3)	2 (4)	1 (2)
Physical health			
Treated somatic complaints	55 (48)	22 (42)	33 (52)
CNS (incl. headache)	23 (20)	7 (13)	16 (25)
Heart & lungs	11 (10)	5 (10)	6 (10)
Urinary system	3 (3)	2 (4)	1 (2)
Gastrointestinal	20 (18)	9 (18)	11 (18)
Untreated somatic complaints (excl. Pain)	106 (92)	49 (94)	57 (90)
CNS (incl. Headache)	88 (77)	43 (83)	45 (71)
Heart & lungs	29 (26)	15 (30)	14 (23)

Table 1: Description of the study population and distribution of predictors

	All N (%)	Female N (%)	Male N (%)
Urinary system	36 (32)	19 (37)	17 (28)
Gastrointestinal	45 (40)	22 (44)	23 (37)
Psychosocial resources			
Social relations			
Living with a partner	70 (64)	30 (59)	40 (69)
Children	95 (86)	41 (80)	54 (92)
Have no friends/family in Denmark	22 (17)	11 (19)	11 (16)
Income			
Working	8 (8)	5 (10)	3 (5)
Retired	10 (10)	4 (8)	6 (11)
Public support	85 (81)	38 (79)	47 (82)
Any education	79 (77)	35 (73)	44 (80)
Employment Status*			
Currently	10 (11)	5 (12)	5 (10)
Never	20 (22)	4 (10)	16 (33)
Previously	60 (66)	33 (79)	27 (55)
Permanent leave to stay	87 (91)	37 (88)	50 (93)
Translator needed	64 (50)	25 (42)	39 (57)

* significant difference between men and women p<0.05

Socioeconomic background

Only 9% of patients were currently working and 22% of patients had never worked. Most patients lived on very low public support. The majority of those without work experience were women from Iraq, Iran or Afghanistan. Of the patients 23% had no education at all (including primary school). Most of the patients lived with a partner (64%) and had children (86%). Among the patients 17% had no family, children, spouse or friends in Denmark and 2% reported having no friends or family at all (see Table 1). These results describe a patient population largely living socially isolated, without work and with very limited financial resources.

Current Health Condition

PTSD and depression

Of the included patients 86% suffered from PTSD, 94% had a moderate or severe

depression and of these 83% had both diagnoses. All included patients also had PTSD and/or depression according to DSM-IV. Patients generally scored very high on symptom rating scales with a mean initial score on HTQ of 3.24 (SD 0.42), mean initial score on HSCL-25 part I (anxiety) of 3.12 (SD 0.58) and part II (depression) score of 3.18 (SD 0.47). Patients scored high on all symptoms, but especially recurrent nightmares and memories as well as sleep disturbance, concentration difficulties and hopelessness. Remarkably, relatively low scores on difficulty remembering events (mean 2.14, SD 1.18) and inability to feel emotions (mean 2.57, SD 1.20) were reported. The highest anxiety score on an individual item was observed for the item headache. In general, lower scores were observed on physical anxiety symptoms such as trembling, heart pounding and dizziness

than on the HTQ PTSD symptoms and the more generalized symptoms of fearfulness and nervousness. Patients generally had low scores on somatic symptoms associated with depression such as poor appetite and loss of sexual interest and they scored very low on suicidal thoughts. The WHO-5 scale measures quality of life on five dimensions. The mean score in the study population was 14 out of 100 indicating very low quality of life and high risk of depression.

Psychotic symptoms

Despite exclusion of all patients with a diagnosis of psychosis or bipolar disorder, 18 patients corresponding to 16% of the patients were assessed psychotic by program doctors or psychologists at the initial screening or during the course of treatment. None of these patients had at any time during the programme symptoms meeting the diagnostic criteria for a diagnosis of psychosis according to ICD-10, whereas all patients with psychotic symptoms had depression according to ICD-10. Of these 16 patients had severe depression and two had moderate depression. However, the psychotic symptoms described were not of the nihilistic or somatic character, which is common in psychotic depression. Analyzed with t-test, there was a higher symptom score on all three symptom clusters of PTSD (re-experiencing, avoidance and arousal) in patients with psychotic symptoms and the difference between psychotic and non-psychotic groups was significant for avoidance symptoms (diff=1.03, p=0.02).. Previous psychotic episodes were reported by 15 patients, but none reported previous manic episodes. Half of the patients had received antipsychotics before the current treatment and half reported to have been healthy before the trauma. Two thirds of the psychotic patients were women.

Somatic symptoms

Self-reported somatic symptoms or somatic disorders were compared with the reported pharmacological somatic treatment the patient reported receiving. If a patient were in relevant treatment for a reported somatic symptom, the symptoms were classified as “treated”, which was the case for 48% of patients, whereas 92% of patients reported untreated symptoms from one or more organ systems. Pain was a separate category since 98% of patients reported pain in head, back, arms or legs (see Table 1).

Functioning/Disability

The score for level of functioning (Sheehan Disability Scale) was very low. On the SDS scale work life (8.9) and social life (8.5) were most affected whereas the score for housework was 6.9. The total score in our sample was 24.3. In other outpatient settings the SDS total score (0-30) has been between 10 and 15 for conditions such as depression, panic attacks, alcohol abuse, OCD and generalized anxiety disorder.²⁹

Co-morbidity and Correlation among outcomes

An ICD-10 diagnosis of PTSD or depression was significantly correlated with the corresponding self-rating (HTQ and HSCL-25). There was a significant correlation between patients with psychotic symptoms during treatment and higher self-rated symptoms of depression (HSCL-25) and PTSD (HTQ) and lower self-rated level of functioning. The more body parts the patients reported to be painful, the higher the score on self-rated anxiety symptoms (HSCL-25) and the lower self-rated quality of life (WHO-5) and level of functioning, and the higher prevalence of untreated somatic complaints (see Table 2). However, there is limited variability in prevalence, since most patients in the

Table 2: Correlations between self-ratings and ICD-10 diagnoses and symptoms

	HSCL -de	HSCL	HTQ -an	WHO5	SDS	ICD10	CD10 dep	Psychotic PTSD	Pain	Treated somatic	Untreated somatic
HSCL-dep	1.00										
HSCL-an	0.72*	1.00									
HTQ	0.69*	0.68*	1.00								
WHO5	-0.62*	-0.49*	-0.50*	1.00							
SDS	0.42*	0.35*	0.53*	-0.52*	1.00						
ICD10 dep	0.28*	0.09	0.07	-0.14	0.07	1.00					
ICD10 PTSD	0.05	0.10	0.28*	0.05	0.06	-0.07	1.00				
Psychotic	0.22*	0.13	0.22*	-0.18	0.22*	0.09	0.10	1.00			
Pain	0.13	0.22*	0.15	-0.24*	0.27*	0.02	-0.02	-0.07	1.00		
Treated somatic	0.00	0.04	-0.06	-0.05	-0.03	0.09	-0.02	-0.06	-0.01	1.00	
Untreated Somatic	0.04	0.15	-0.02	-0.04	0.13	0.12	-0.02	0.13	0.23*	-0.11	1.00

* p<0.05

Table 3: Co-morbidities ranked by prevalence of co-existence

	Main condition					
	Followed by co-morbidities (in same column)					
	Depression (N=123)	PTSD (N=109)	Pain (N=122)	Psychotic (N=18)	Untreated physical (N=106)	Treated physical (N=55)
Depression	n/a	105 (96%)	118 (97%)	18 (100%)	103 (97%)	54 (98%)
PTSD	105 (85%)	n/a	105 (86%)	17 (94%)	91 (86%)	47 (85%)
Pain	118 (96%)	105 (96%)	n/a	16 (89%)	105 (99%)	54 (98%)
Psychotic	18 (15%)	17 (16%)	16 (13%)	n/a	16 (15%)	7 (13%)
Untreated physical	103 (84%)	91 (83%)	105 (86%)	16 (89%)	n/a	49 (89%)
Treated physical	54 (44%)	47 (43%)	54 (44%)	7 (39%)	49 (46%)	n/a

sample suffer from several co-morbid diseases. We therefore ranked the co-morbidities according to their inter-correlations (see Table 3). This however, also reflects the prevalence of diseases. Pain and depression are the most common co-morbidities because almost all patients suffered from these symptoms.

Predictors of health outcomes

Demography

In unadjusted analyses, self-rated quality of life was significantly better in men than in women (WHO-5), but this could not be reproduced in multivariate models. Higher age was associated with psychotic symptoms and lower age with higher self-reported pain score in uni- and multivariate regression modeling. We found no association between country of origin and outcome variables although we specifically tested differences between predictors and outcomes with regards to the group of 52 Iraqis compared to the rest of the patient population using linear regression to test for interaction.

Pre-migratory predictors

Among the pre-migratory factors listed in Table 1 we only found a significant association between persecution and higher score on PTSD arousal symptoms on HTQ and depression symptoms on HSCL-25 and between imprisonment and higher scores on HSCL-depression in univariate regression models. When fitting a multivariate regression model with all significant predictors for each scale, persecution remained significantly associated with higher score on arousal symptoms. Being an ex-combatant was significantly associated with higher self-reported pain in both univariate and multivariate linear regression modelling. We found no significant association between accumulated trauma and mental disorder.

Prior mental health and treatment

Taking more than one psychopharmacological drug at assessment was associated with lower self-rated quality of life (WHO-5), more self-rated depression symptoms (HSCL-25) and psychotic symptoms in univariate models. This was also reflected in a significant association between taking antipsychotics before assessment and more self-rated depression symptoms (HSCL-25) / psychotic symptoms in univariate analysis. Back pain was associated with untreated somatic symptoms in both uni- and multivariate regression models, whereas pain in the legs was associated with more self-rated depression symptoms (HSCL-25) in both uni- and multivariate regression models. Finally, higher scores on PTSD arousal symptoms (HTQ) were associated with headache, backache, pain in arms and number of body parts in pain in univariate as well as multivariate regression models.

Post-migratory predictors

Social isolation (social contacts, living with a partner and having children) was associated with higher self-rated PTSD arousal symptoms (HTQ) and self-rated pain in uni- and multivariate regression modelling. Never having worked was associated with higher self-rated PTSD avoidance symptom score (HTQ), lower self-rated quality of life (WHO-5) and level of functioning (SDS) in univariate models. Low level of functioning and quality of life was also associated with current unemployment in univariate analysis. Receiving welfare benefits was associated with a lower self-rated quality of life, needing a translator and a lack of a permanent resident status in univariate analysis. Being retired was associated with a lower level of functioning in univariate analysis. However, only social isolation was significantly associated with outcomes in multivariate analysis.

Discussion

As expected the patients had a high prevalence of depression and PTSD as well as high co-morbidity of unexplained somatic complaints, chronic pain and psychotic symptoms. We found an association between persecution and HTQ arousal symptoms and between being an ex-combatant and self-reported pain. Finally, we found an association between social isolation and HTQ arousal symptoms as well as with self-reported pain.

The health condition of the patients

It is well-established that trauma patients often suffer from both depression and PTSD, but that they co-exist with various other diseases has been less well-described. Refugees with PTSD suffer from a high prevalence of somatic complaints,^{5, 6, 8, 30} but it remains unclear whether this is mainly due to underlying somatic disease, somatization or is related to other mental disorders such as anxiety, PTSD or depression. Studies have generally taken very different approaches to the identification and categorization of somatic complaints and few studies have examined patients for medical disorders. Evidence for an association between trauma, PTSD and somatic disease is emerging from other studies and this is supported by biological models and corresponding biomarkers. Patients with PTSD have increased prevalence of cardiovascular disease, rheumatoid arthritis, psoriasis, osteoporosis and thyroid disease and it has been suggested that this association may be mediated by autoimmune activation, which may be present before the development of PTSD or be caused by neuroendocrine and sympathetic nervous system activation.^{31, 32} It has also been suggested that the association between somatic disease and PTSD is modified by depression. The 48% prevalence

of treated somatic complaints and 92% for untreated somatic complaints in our sample is very high considering the mean age of 42 in the sample. The actual prevalence may be even higher, since our information is based on patient reports of medical treatment. Cognitive dysfunction such as memory and concentration problems may have resulted in underreporting, but self-report may also result in over-reporting of symptoms. The findings therefore need to be better investigated and validated in future studies.

Chronic pain symptoms in torture survivors is well-described² and pain in PTSD populations has been examined although it is debated whether PTSD is directly associated with pain symptoms or whether this is mediated by depression.^{1, 7} Further complicating the understanding is the fact that it is known that torture survivors may have direct physical injuries from the torture which cause pain many years after. In this study, pain in the legs was associated with higher score on depression symptoms and PTSD arousal symptoms were associated with all pain measures except for pain in the legs. The association between pain and arousal symptoms such as feeling jumpy, on guard and irritable could possibly be explained by a condition of chronic muscle tension. However, overall pain was so prevalent in the patient sample that it is difficult to conclude about the predictors of pain in this study.

We found a relatively high prevalence of psychotic symptoms in patients with PTSD, thereby confirming previous, although scarce, reports of PTSD with psychotic symptoms in traumatized refugees. Most of the published literature on the topic is in the form of case reports.^{9, 10} Braakmann quotes prevalences of psychotic symptoms of 15–64% amongst patients with PTSD,¹¹ which corresponds with the observations in

our study. We found a prevalence of 16%, but excluded all symptoms that seemed to be trauma-related. Had these been included, the prevalence would likely have been much higher. In the categorization of cases we used criteria which corresponded to those suggested by Braakman.¹¹ We found that psychotic symptoms were related to higher self-rated symptoms of PTSD and depression and level of functioning. This can partly be explained by psychotic symptoms being difficult to distinguish from flashbacks, depressive psychotic reactions and culturally-bound ways of expressing distress. However, only 18 patients were diagnosed with psychotic symptoms and of these only one did not have PTSD and two did not have pain and untreated somatic symptoms. These findings need to be further examined, but this study suggests that there may be more psychotic phenomena associated with mental disorders after trauma and migration than previously described.

Studies show that the symptoms of depression and PTSD generally decrease over time.^{19, 33} Our sample was characterized by a very low level of functioning and high symptom scores despite a long stay in Denmark. This is likely to reflect the selection of the most ill patients to the clinic, and for these patients lack of access to their cultural beliefs, food, language, community and family support that they used to have in their home country may contribute to their low level of function and high symptom load. This has been described in Cambodian refugees in the US, which still have a high prevalence of PTSD, depression and anxiety even two decades after resettlement.²² However, our patient population may differ in important ways from those study populations, which have traditionally been included in studies of post-migratory predictors of mental health. Generally, these study

populations have been in their new country of residence shorter time and they tend to improve in health and level of functioning the longer they have been in exile. The population described here was predominantly from the Middle East, which is comparable to refugee populations in other Scandinavian studies,^{3, 15-17} but very different from the ethnic origin of patients in the North American^{13, 14} and German studies.¹⁸

The association between pre-migratory and post-migratory factors and current mental health

Most of the patients had experienced war and persecution, but only about half of the patients were torture survivors. In this respect, the population differs from other study populations who have predominantly been torture survivors and survivors of political violence.¹⁵⁻¹⁷ Numerous studies have looked at the relationship between pre-migratory trauma and PTSD and depression¹⁹⁻²² and one study has also looked at the association between somatoform disorder and trauma.³⁴ In general, the relation is well-established, but it is hard to study because pre-migratory trauma is context dependent. There seems to be a cumulative effect of trauma although the type of trauma might also influence mental health outcomes.^{19, 21} Our sample only included patients who had suffered torture or experienced war and had a trauma-related affective or post-traumatic disorder. The high prevalence of trauma in the sample is due to this selection, which makes it difficult to analyze effects of trauma. However, we did find some significant associations between trauma and outcome. Persecution was significantly associated with higher score on HTQ arousal symptoms and being an ex-combatant was significantly associated with a higher self-reported pain in multivariate linear regression models.

Although post-migratory predictors of trauma related disorders have been studied in various migrant populations, few comparable studies exist and few results have been replicated. There seems to be some evidence for the importance of employment^{19, 22, 23} and economic strain,²² language proficiency^{19, 22} and social support.^{17, 21, 23} There is evidence that the length of the asylum procedure and stay in asylum centres³⁵ is of importance whereas the evidence on the importance of type of legal status is unclear.³⁵ The influence of education is also unclear. There is some evidence for the association between PTSD and/or depression and all of the post-migratory predictors analyzed in this study, but the political context and cultural background of populations in other studies differ. The different context may partly explain why social isolation was the only predictor significantly associated with outcomes in the multivariate predictor analysis. Lack of social support was also the only post-migratory predictor of mental health in another study of a similar refugee population in Denmark.¹⁷

In this study, we included a number of factors reflecting previous mental health and treatment received in the past (previously received psychiatric treatment including psychotropic drugs, having been healthy before the war trauma). This seems to have been less well-described and studied in traumatized refugee populations. This may partly be explained by the fact that this kind of information is difficult to assess, as it is less factual, depends on self-report and is therefore vulnerable to recall bias and patients' understanding of what mental health problems are and which treatment they have received in the past. This has likely also influenced our study and may explain that we were unable to detect any

clear associations between previous mental health and treatment and current mental state.

Limitations

We found only a few predictors of mental health and functioning, but this may be due to the small sample size or the fact that the population sample was very homogeneous regarding most potential predictors and the outcome measures. The analysis may also have been influenced by the quality of the available information from the patients since it was collected as part of a clinical interview and not based on strict research definitions of indicators. Data on previous psychiatric treatment and morbidity are very difficult to verify and validity is further limited by the prevalence of memory and concentration problems among the patients. Furthermore, only inclusion diagnoses were based on a semi-structured interview and therefore we might have missed some co-morbidity diagnoses. For instance, it was deemed impossible to distinguish the combination of PTSD and depressive symptoms from anxiety symptoms, and consequently additional anxiety-diagnoses were not used. The patients may also have other culturally based expressions of their response to trauma, which have not been captured by using standard clinical diagnoses. The self-ratings might over- or under-estimate the patients' condition. The analysis is further complicated by the fact that the study was made with a convenience sample of patients from a specialized clinic with traumas dating many years back, and who were selected for having trauma-related disorders and war related trauma in their history. The way the study is designed, we do not know the condition of patients not referred to the clinic. Given that data was collected at a specialized clinic serving patients in need of

special treatment across the country, the sample is likely to reflect the patients that are most in need. The understanding of the patients' condition and pre-migratory predictors may be affected by the number of traumatic events the patients have experienced. This is very difficult to assess in populations with multiple and accumulated trauma, but using a crude measure of adding the number of traumas recorded did not have a significant association with current mental health. The understanding of the association between mental health and post-migratory predictors is complicated by the patients having been in Denmark for very different periods and by our limited knowledge of post-migratory events.

Conclusions

Despite the methodological challenges, the study confirms that the patients suffer from many psychiatric co-morbid diagnoses, very low level of functioning and low quality of life. The study has supported the hypothesis that traumatized refugees suffer from a number of co-morbid mental disorders. In addition to very high co-morbidity of depression and PTSD, we observed high levels of pain and somatic symptoms. The prevalence of treated somatic complaints was higher than expected. This suggests that there is an association between somatic disorders and mental health in traumatized refugees. This needs to be further investigated so that somatic symptoms can be properly addressed by appropriate somatic and psychiatric treatment. Very few studies have evaluated psychotic symptoms of traumatized refugees with PTSD and depression. We found a high prevalence of psychotic symptoms even when all trauma-related symptoms were excluded from the analysis. This finding needs further investigation as it suggests that the trauma-related diagnoses in ICD-10 do not suffi-

ciently cover the clinical reality of chronically ill patients with war trauma. Overall, the number of co-morbid diagnoses explains the very low level of functioning and quality of life observed in the patient sample. Further qualification of the clinical syndromes of traumatized refugees is of outmost importance if we are to develop treatments with larger effects than those we have at our disposal today. We found a significant association between posttraumatic arousal symptoms and persecution and pain and having been an ex-combatant and living in social isolation. Among the post-migratory factors only social isolation had a significant association with HTQ arousal symptoms and pain. We had expected to find additional associations between pre-migratory trauma and current health condition and between post-migratory factors and mental health status. As noted, the sample selection and inclusion criteria may have resulted in limited variance on some potential predictors and on outcome ratings and this may have contributed to the lack of significant associations.

In conclusion, co-morbidity of traumatized refugees and predictors of their condition needs further investigation. If the findings generated by this analysis are confirmed, the results will have substantial implications for development of treatments, comparability with other study populations and methodology of future outcome studies. New treatment modalities should seek to address all of the symptoms and challenges of the patients including psychotic and somatic symptoms and social isolation, and studies of treatment effect should clarify all co-morbidities so that comparable populations can be included in treatment evaluation studies.

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