Psychiatry Research 271 (2019) 684–692

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Interpreter-mediated psychotherapy with trauma-affected refugees – A retrospective cohort study

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ARTICLE INFO

Keywords:
Posttraumatic stress disorder
Cognitive behavioural therapy

ABSTRACT

The aim of this retrospective cohort study was to examine if interpreter-mediated psychotherapy with trauma-affected refugees affects treatment outcome. The clinical sample consisted of 825 patients who, as part of treatment, were offered 16 sessions of cognitive behavioural therapy. The cohort was allocated to two subsamples based on whether interpreters were used in psychotherapy or not and the treatment outcome for the two subsamples was compared. The primary outcome measure was severity of PTSD-symptoms (Harvard Trauma Questionnaire (HTQ)) and secondary outcome measures were depression and anxiety symptoms (Hopkins Symptom Checklist-25 (HSCL-25), Hamilton Depression and Anxiety rating scales (HAM-D, HAM-A)), somatisation (somatisation items of SCL-90 (SI-SCL-90)), quality of life (WHO-5-Well-being Index (WHO-5)) and functioning (Sheehan Disability Scale (SDS), Global Assessment of Functioning (GAF-F, GAF-S)). Compared to no use of interpreter, the use of interpreter in psychotherapy was associated with less improvement during treatment on the primary outcome measure HTQ and the secondary outcome measures HSCL-25, SI-SCL-90, SDS, WHO-5, HAM-A, but not on GAF-S, GAF-F and HAM-D. Based on the primary outcome measure HTQ and the majority of the secondary ratings the subsample in interpreter-mediated psychotherapy had less improvement in their mental health status compared to the subsample without interpreter.

1. Introduction

UNHCR estimates that the global refugee population reached 22.5 million at the end of 2016 - the highest number for two decades (UNHCR Global Trends –Forced displacement in 2016, 2017). Previous research (Turrini et al., 2017) suggests that refugees constitute a vulnerable group to mental disorders such as Post-traumatic Stress Disorder (PTSD), depression and anxiety. Recent reviews (Nose et al., 2017; Tribe et al., 2017) have found that trauma-focused interventions such as Narrative Exposure Therapy (NET) and adapted versions of Cognitive Behavioural Therapy (CBT) are efficacious therapies for treatment of trauma-affected refugees with PTSD.

Meanwhile, psychiatric treatment for this population entails challenges due to cross-cultural variations in perception of symptoms and understanding of treatment (Bhugra et al., 2014). One challenge regards the situation where patients with limited language proficiency may need the assistance of an interpreter to mediate the psychiatric treatment.

Previous systematic reviews (Flores, 2005; Karliner et al., 2007) found that inadequate interpreter services can affect the quality of health care and that the use of professional interpreters is associated with improved quality of health care with regard to better communication, increased patient satisfaction and improvement of clinical outcomes. A systematic review (Bauer and Alegría, 2010) showed that use of professional interpreters in psychiatric treatment facilitated a more complete disclosure of psychological symptoms and trauma. Unfortunately, the review also found that interpreter-mediated psychiatric treatment was prone to errors that could impede the assessment, treatment planning and the therapeutic process.

Multiple studies have explored the dynamics in the therapeutic process when an interpreter is included in psychotherapy. These studies indicate a complex impact on the therapeutic alliance and the relationships between the participants. According to a recent review (Jensen et al., 2017), relational issues surrounded the interpreter-mediated psychotherapy and the interpreter's role in the sessions was characterised by diversity, all of which could affect the therapeutic

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https://doi.org/10.1016/j.psychres.2018.12.058
Received 29 August 2018; Received in revised form 23 November 2018; Accepted 9 December 2018
Available online 10 December 2018
0165-1781/

alliance. Studies report how clinicians can experience both enhancement and challenges in their work with interpreters in the therapeutic setting. Interpreters can facilitate better communication and cultural understanding of the patient, which improves treatment, but at the same time clinicians can feel detached from the patient and less effective in the therapeutic work (Raval, 1996; Raval and Smith, 2003; Miller et al., 2005; Pugh and Vetere, 2009; Leanza et al., 2015). Lack of consensus regarding the role of the interpreter in the triadic setting seem to be one of the issues that causes difficulties in the cooperation between clinicians and interpreters (Raval and Smith, 2003; Miller et al., 2005; Becher and Wieling, 2015; Kuay et al., 2015; Leanza et al., 2015; Resera et al., 2015) and this highlights the need for training of clinicians and interpreters working in the interpreter-mediated setting (Miller et al., 2005; Pugh and Vetere, 2009; Yakushko, 2010).

A previous study (Del Re et al., 2012) found that therapists' contributions to the therapeutic alliance was a significant predictor of treatment outcome and that patients with therapists who did better in developing the therapeutic alliance tend to achieve better outcomes. Clinicians' concerns regarding working in the interpreter-mediated setting could therefore potentially affect the therapeutic alliance and thereby treatment outcome.

Knowledge about the interpreter's impact on psychotherapeutic treatment outcome is limited. A meta-analytic study (Lambert and Alhassoon, 2015) based on 12 randomised controlled trials concerning psychotherapeutic intervention for trauma-affected refugees explored this subject. Furthermore, three observational studies (Schulz et al., 2006; d'Ardenne et al., 2007; Brune et al., 2011) examined the issue. None of the four papers found a difference in treatment outcome between the subsample in interpreter-mediated psychotherapy and the subsample in psychotherapy without interpreter.

Due to the limited research and the challenges related to interpreter-mediated psychotherapy, the impact of interpreter-mediated psychotherapy is still of concern. In order to add to the limited knowledge in this research field the aim of this retrospective cohort study was to examine if the results of the previous studies could be reproduced or if use of interpreter in psychotherapy is associated with treatment outcome in a large sample of trauma-affected refugees.

2. Methods

2.1. Setting

The sample consisted of patients who received treatment at the Competence Centre for Transcultural Psychiatry (CTP) 15 June 2009 – 1 October 2015. CTP is a public specialised transcultural psychiatric outpatient clinic located at Mental Health Centre Ballerup, Mental Health Services in the Capital Region of Denmark. CTP offers multidisciplinary treatment consisting of psychotherapy, social counselling and consultations with medical doctors. Patients must have obtained asylum and have been granted either temporary- or permanent resident status or Danish citizenship in order to be offered treatment at the CTP. All patients in the current study participated in one of CTP's four randomised clinical trials (further on referred to as PTFs or PTF1-PTF4) (Nordbrandt et al., 2015; Buhmann et al., 2016; Sonne et al., 2016a; Carlsson et al., 2018). The target population at CTP has previously been described as having severe and complex symptoms, comorbidity, low level of functioning and chronicity, and previous studies have shown limited treatment outcome for the population (Carlsson et al., 2014; Buhmann et al., 2016; Sonne et al., 2016a; Nygaard et al., 2017; Carlsson et al., 2018).

2.2. Treatment

The participants received CBT and consultations with a medical doctor. The course of treatment was divided into two phases. The first phase lasted approximately two months and consisted of six consultations with a medical doctor. The second phase lasted four to six months and included monthly consultations with a medical doctor together with weekly psychotherapeutic treatment. The rationale for the split of treatment into two phases was to start psychopharmalogical treatment for the patients in need of medication during the first phase and thereby try to improve cognitive ability during psychotherapeutic treatment in second phase.

2.2.1. Consultations with a medical doctor

The consultations with the medical doctor (MD) concerned psychopharmacological treatment and psychoeducation. All doctors worked in accordance with manuals regarding the psychopharmacological treatment and psychoeducation and they were trained in these.

2.2.2. Psychotherapy

The psychotherapeutic treatment consisted of individual manual-based flexible CBT. The psychotherapeutic manuals in the PTFs were developed by the psychologists at CTP. They were based on the existing literature on PTSD treatment and the psychologists' clinical experiences with the transcultural patient group. The manuals included elements of trauma-focused CBT (TF-CBT), stress management (SM), acceptance and commitment therapy (ACT) and mindfulness. The manuals are described in earlier publications (Sonne and Vindbjerg, 2013; Vindbjerg et al., 2014; Buhmann et al., 2015). All psychologists were trained in the use of the manuals and were experienced in working with interpreters in the therapy sessions. Furthermore, the psychologists received supervision, which included supervision of the adherence to the psychotherapy manual.

2.2.3. The different interventions across the PTFs

Because the study was based on data from the PTFs carried out at CTP there was some treatment variation in the sample due to the specific interventions evaluated in the different PTFs. PTF1 had four intervention groups: (1) MD and CBT, (2) MD, (3) CBT, (4) Waiting list. PTF2 had two intervention groups: (1) MD and CBT with focus on SM, (2) MD and CBT with focus on cognitive restructuring. PTF3 had two intervention groups: (1) MD, pharmacological treatment with venlafaxine and CBT, (2) MD, pharmacological treatment with sertraline and CBT. PTF4 had three intervention groups: (1) MD and CBT, (2) MD, CBT and Basic Body Awareness Therapy, (3) MD, CBT and mixed physical activity. The different interventions in the PTFs are further described in previous articles (Nordbrandt et al., 2015; Buhmann et al., 2016; Sonne et al., 2016a; Carlsson et al., 2018).

2.3. Participants

825 patients were included in this study. They fulfilled the PTFs' inclusion criteria: being at least 18 years old, being a refugee or having been a member of a family who were reunited with a refugee, being diagnosed with PTSD (ICD-10 F43.1), having a history of psychological trauma (such as imprisonment, torture, war, persecution), being motivated to receive treatment and giving written informed consent. Patients diagnosed with a psychotic disorder (ICD-10 F2x and F30.1-F30.9), current alcohol or drug abuse (ICD-10 F1x.24-F1x.26) or in need of being admitted to either somatic or psychiatric hospitals at the pre-treatment assessment were excluded from the PTFs. Some of the PTFs had unique exclusion criteria, which were related to the specific intervention in the PTF. These have been described in previous publications (Nordbrandt et al., 2015; Buhmann et al., 2016; Sonne et al., 2016a). Additionally, patients in PTF3 could be included if they were diagnosed with PTSD and/or depression. One patient in the PTF3 was diagnosed with depression and not with PTSD and was therefore excluded from current study. Furthermore, the participants in PTF1 that were randomised to receive no CBT were excluded from current study, while those that were randomised to receive no MD were included in the study.

2.4. Outcome measures

The participants completed a range of standardised rating scales before and after treatment using the pre-post score differences as measure of treatment effects. The primary outcome measure was severity of PTSD symptoms rated by Harvard Trauma Questionnaire (HTQ), part IV (Mollica et al., 1992). The secondary outcome measures were depression and anxiety symptoms rated by Hopkins Symptom Check List-25 (HSCL-25) (Mollica et al., 1987), somatisation rated by the somatisation items of SCL-90 (SI-SCL-90) (Derogatis, 1994), functioning rated by Sheehan Disability Scale (SDS) (Sheehan and Sheehan, 2008) and quality of life rated by The WHO-5 Well-being Index (WHO-5) (Folker and Folker, 2008). In addition to self-report ratings observer ratings were completed. Functioning was rated by the Global Assessment of Functioning (GAF-F and GAF-S) (Schwartz, 2007) and were completed by the medical doctors in charge of treatment. Furthermore, depression and anxiety symptoms were rated by the Hamilton Depression Rating Scale (HAM-D) (Hamilton, 1960) and the Hamilton Anxiety Rating Scale (HAM-A) (Hamilton, 1959) and were completed by blinded medical students who were trained in performing the Hamilton interviews.

All self-report ratings were available in the five most common languages at CTP (Arabic, Farsi, Bosnian, Danish and English). If no translated ratings were available in the patient's language, an interpreter translated the Danish version.

2.5. Interpreters

In the Danish health care system, the service providers are legally obligated to provide an interpreter service free of charge when linguistic barriers occurs. During the pre-treatment assessment, the medical doctors evaluated the patients' language skills and interpreters were provided for the patients when the linguistic understanding between patient and clinician were insufficient. The patient had one assigned interpreter during the entire course of treatment and the interpreter was present during the sessions. The interpreters were associated with CTP and experienced in translating the psychotherapy sessions and the rating scales. Furthermore, they worked according to CTP's guidelines for best practice in interpreter-mediated settings. Around 60 interpreters worked at CTP 15 June 2009 – 1 October 2015. Due to the high number of different interpreters during the PTFs and missing data on new interpreters it was not possible to explore a potential association between the individual interpreter and treatment outcome. Additionally, the interpreter characteristics may be assumed to interact with psychologist characteristics and this would make it almost impossible to evaluate the individual interpreter's impact on treatment outcome with the current study design. In Denmark, interpreters do not need any formal authorisation or education to work in the health care system. Therefore, it is difficult to evaluate the general quality of interpreters and the variance in quality among the interpreters.

The sample subjects were allocated to two subsamples based on the use of interpreters in psychotherapy. One subsample encompassed the patients who used interpreters during psychotherapy (I-subsample). The other subsample consisted of the patients that did not use interpreters during treatment (NI-subsample).

2.6. Statistical analyses

The statistical analyses were conducted in STATA 14. Descriptive data regarding the characteristics of the cohort and the treatment conditions were analysed with *t*-tests and chi-square for possible differences between the I- and NI-subsamples. Paired *t*-tests were used to measure a potential difference between pre- and post-treatment rating scores in each of the two subsamples. *T*-tests for independent groups were used to evaluate possible differences between the two subsamples' pre-treatment scores, post-treatment scores and pre-post differences. Furthermore, the potential influences of other covariates on the association between use of interpreter and treatment outcome were controlled for. For example, patients in need of interpreter service could potentially be more recently arrived refugees without permanent status and more recent traumas. The selection of covariates was based on findings of factors associated with refugee mental health in the existing literature (Porter and Haslam, 2005; Carlsson et al., 2006; Carswell et al., 2011; Bogic et al., 2015; Sonne et al., 2016b; Bruhn et al., 2018). The covariates were divided into the following five domains: (1) Personal data included age, gender, being Muslim, being married, having children under 18 years, living alone; (2) Sociodemographic information included education, income, permanent resident status or citizenship, length of stay in Denmark; (3) Psychopathology, functioning and trauma history involved having been exposed to torture, previous imprisonment, leaving home every day, duration of psychiatric symptoms; (4) Treatment conditions consisted of time in multidisciplinary treatment, number of psychotherapy sessions, participation in specific PTF; (5) Country of origin which included Iraq, Afghanistan, Iran, Ex-Yugoslavia, Lebanon. Preliminary multiple linear regression analyses were performed for each domain on all the treatment outcomes. If a variable in one of the preliminary analyses was significantly associated with treatment outcome on at least one of the rating-scales and significantly associated with the use of interpreter, the variable was included in the final multiple linear regression model which was used on all the treatment outcomes. Lastly, the model was analysed with Full Information Maximum Likelihood (FIML) to base the model on all available information, including pre-treatment rating scores despite missing post-treatment rating scores. The model was analysed both with the pre-treatment rating scores included (a) and without the pre-treatment rating scores included (b).

2.7. Ethical considerations

All participants provided voluntary written, informed consent to participate in the PTFs at CTP. The Ethics Committee of the Capital Region of Denmark approved all the PTFs. The Danish Data Protection agency permitted the data processing in the current study.

3. Results

The flow of the participants is shown in Fig. 1. In total, 646 participants completed eight or more psychotherapy sessions and were defined as completers. Eight sessions were estimated as a minimum for a possible benefit from psychotherapy in this population. In each subsample 78% of the intention-to-treat samples were completers. The statistical analyses shown below were based on completers.

3.1. Description of the participants

Pre-treatment characteristics of the participants in the two subsamples are shown in Table 1. The NI-subsample had on average lived in Denmark four years longer and had a larger proportion coming from Iran and Ex-Yugoslavia. In addition, a higher percentage of the NI-subsample had more than 10 years of education in their home country, received a salary/state education grant in Denmark, held citizenship/permanent resident status and had received previous psychotherapy. The NI-subsample had a smaller proportion coming from Iraq and Lebanon and a lower percentage who were Muslims and were married.

Compared to the non-completers the completers had on average lived in Denmark two years longer, consisted of a higher percentage of female patients and had a larger proportion coming from Ex-Yugoslavia. In addition, a higher percentage of completers had more than 10 years of education in their home country, were married, had children under 18 years, held citizenship/permanent resident status, had psychiatric symptoms for over 10 years and had received previous psychotherapy. Among the completers a lower percentage lived alone

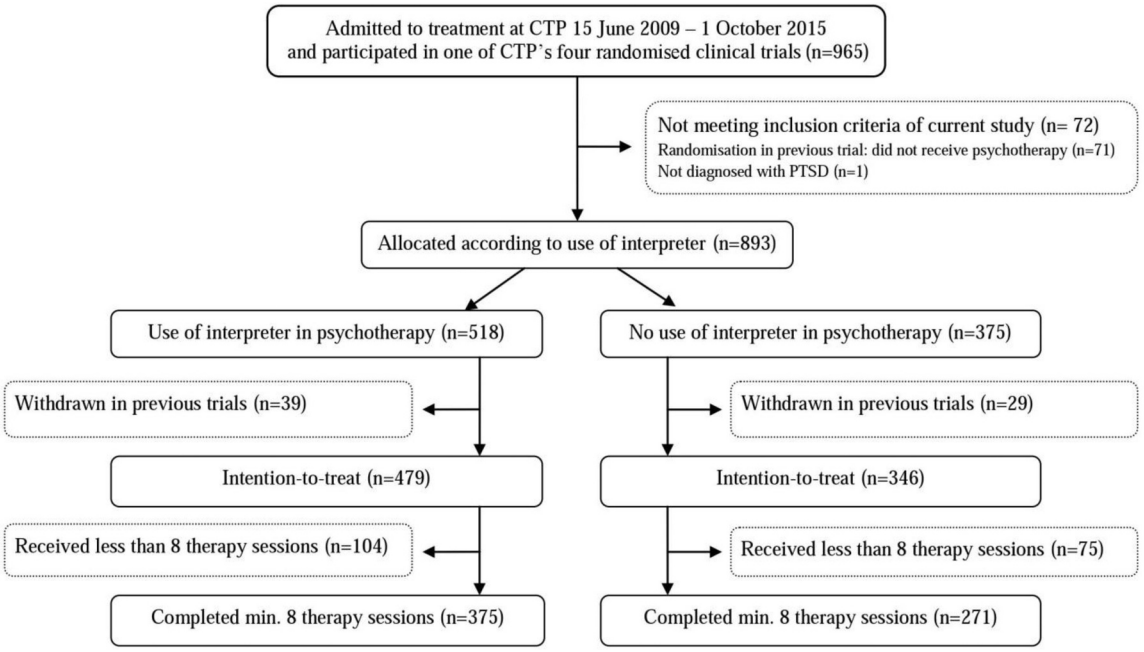

Fig. 1. Flow diagram of the study population.

Table 1
Description of the study population.

Variable	Completers (n = 646)	Interpreter (n = 375)	No interpreter (n = 271)
Personal- and sociodemographic information			
	Mean (SD)		
Years since arrival in Denmark (n = 644)*	15.4 (7.2)	13.7 (7.2)	17.7 (6.6)
Age, years	45.2 (9.1)	45.7 (9.0)	44.5 (9.1)
	***N* (%)**		
Male	338 (52.3)	185 (49.3)	153 (56.5)
Country of origin			
▪ Iraq*	215 (33.3)	150 (40.0)	65 (24.0)
▪ Afghanistan	88 (13.6)	46 (12.3)	42 (15.5)
▪ Ex-Yugoslavia*	84 (13.0)	23 (6.1)	61 (22.5)
▪ Iran*	78 (12.1)	31 (8.3)	47 (17.3)
▪ Lebanon*	74 (11.5)	51 (13.6)	23 (8.5)
Muslim (n = 598)*	475 (79.4)	297 (85.6)	178 (70.9)
Married (n = 645)*	354 (54.9)	228 (61.0)	126 (46.5)
Children < 18 years old (n = 640)	420 (65.6)	251 (68.0)	169 (62.4)
Living alone all the time (n = 645)	154 (23.9)	82 (21.9)	72 (26.6)
Education > 10 years from country of origin (n = 618)*	344 (55.7)	164 (46.5)	180 (67.9)
Income: receiving salary/state education grant (n = 641)*	45 (7.0)	8 (2.2)	37 (13.8)
Permanent resident status/citizenship (n = 635)*	503 (79.2)	260 (71.2)	243 (90.0)
Trauma history			
	N (%)		
Torture (n = 644)	281 (43.6)	173 (46.3)	108 (40.0)
Imprisonment (n = 645)	306 (47.4)	187 (50.0)	119 (43.9)
Functioning, psychopathology pre-treatment			
	***N* (%)**		
Leaves home every day (n = 621)	406 (65.4)	230 (64.6)	176 (66.4)
Psychiatric symptoms > = 10 years (n = 580)	388 (66.9)	226 (67.1)	162 (66.7)
Diagnosis (ICD-10) in addition to PTSD			
- Depression (F.32.9/F.33.9) (n = 640)	622 (97.2)	361 (97.0)	261 (97.4)
- Enduring personality change after catastrophic experience (F.62.0) (n = 529)	149 (28.2)	79 (26.9)	70 (29.8)
Previous psychotherapeutic treatment (n = 626)*	297 (47.4)	156 (43.2)	141 (53.2)
Treatment conditions			
	Mean (SD)		
Months in multidisciplinary treatment (n = 824)*	10.4 (3.7)	10.9 (3.8)	9.6 (3.5)
Number of psychotherapy sessions*	13.2 (3.1)	12.9 (2.8)	13.7 (3.3)

* Significant group difference, $p < 0.05$.

Table 2
Treatment outcomes.

Rating		Mean pre-treatment score (*SE*)	Mean post-treatment score (*SE*)	Difference	*P*
HTQ					
	All (n = 598)	3.23 (0.02)	3.07 (0.02)	*−0.16 (0.02)**	<0.01
	- Interpreter (n = 351)	3.17 (0.02)	3.07 (0.03)	*−0.10 (0.03)**	<0.01
	- No interpreter (n = 247)	3.30 (0.02)	3.07 (0.04)	*−0.23 (0.03)**	<0.01
	- Difference	−0.13 (0.03)*	0.00 (0.05)	**−0.13 (0.04)***	<0.01
HSCL-25					
	All (n = 590)	3.06 (0.02)	2.94 (0.03)	*−0.12 (0.02)**	<0.01
	- Interpreter (n = 346)	3.06 (0.02)	3.01 (0.03)	−0.05 (0.03)	0.07
	- No interpreter (n = 244)	3.06 (0.03)	2.85 (0.04)	*−0.21 (0.04)**	<0.01
	- Difference	0.00 (0.04)	0.16 (0.05)	**−0.16 (0.05)***	<0.01
SI-SCL-90					
	All (n = 582)	2.60 (0.03)	2.57 (0.04)	−0.03 (0.03)	0.33
	- Interpreter (n = 337)	2.65 (0.04)	2.70 (0.04)	0.05 (0.04)	0.17
	- No interpreter (n = 245)	2.54 (0.05)	2.40 (0.06)	*−0.14 (0.05)**	<0.01
	- Difference	0.11 (0.06)	0.30 (0.08)	**−0.19 (0.06)***	<0.01
SDS					
	All (n = 563)	23.69 (0.24)	22.94 (0.30)	*−0.75 (0.29)**	<0.01
	- Interpreter (n = 332)	23.45 (0.31)	23.37 (0.35)	−0.08 (0.34)	0.81
	- No interpreter (n = 231)	24.03 (0.37)	22.33 (0.53)	*−1.70 (0.50)**	<0.01
	- Difference	−0.58 (0.48)	1.04 (0.64)	**−1.62 (0.61)***	<0.01
WHO-5					
	All (n = 580)	13.72 (0.60)	20.09 (0.92)	*6.37 (0.86)**	<0.01
	- Interpreter (n = 340)	13.41 (0.75)	18.30 (1.13)	*4.89 (1.03)**	<0.01
	- No interpreter (n = 240)	14.15 (1.00)	22.62 (1.55)	*8.47 (1.46)**	<0.01
	- Difference	−0.74 (1.25)	−4.32 (1.91)	**3.58 (1.79)***	<0.05
GAF-F					
	All (n = 436)	49.81 (0.36)	52.48 (0.48)	*2.67 (0.44)**	<0.01
	- Interpreter (n = 259)	49.78 (0.48)	51.35 (0.54)	*1.57 (0.50)**	<0.01
	- No interpreter (n = 177)	49.86 (0.53)	54.12 (0.87)	*4.26 (0.77)**	<0.01
	- Difference	−0.08 (0.72)	−2.77 (1.02)	**2.69 (0.92)***	<0.01
GAF-S					
	All (n = 438)	48.92 (0.30)	52.77 (0.45)	*3.85 (0.41)**	<0.01
	- Interpreter (n = 260)	49.05 (0.39)	51.79 (0.50)	*2.74 (0.45)**	<0.01
	- No interpreter (n = 178)	48.74 (0.49)	54.21 (0.83)	*5.47 (0.75)**	<0.01
	- Difference	0.31 (0.62)	−2.42 (0.97)	**2.73 (0.87)***	<0.01
HAM-D					
	All (n = 573)	23.85 (0.25)	22.87 (0.31)	*−0.98 (0.28)**	<0.01
	- Interpreter (n = 331)	23.86 (0.32)	23.03 (0.38)	*−0.83 (0.35)**	0.02
	- No interpreter (n = 242)	23.83 (0.40)	22.65 (0.52)	*−1.18 (0.45)**	0.01
	- Difference	−0.03 (0.51)	0.38 (0.65)	−0.35 (0.56)	0.53
HAM-A					
	All (n = 569)	27.28 (0.31)	27.07 (0.38)	−0.21 (0.36)	0.55
	- Interpreter (n = 329)	27.39 (0.40)	27.56 (0.46)	0.17 (0.45)	0.70
	- No interpreter (n = 240)	27.14 (0.48)	26.39 (0.62)	−0.75 (0.56)	0.19
	- Difference	0.25 (0.63)	1.17 (0.78)	−0.92 (0.74)	0.20

Completers of both pre- and post-treatment ratings and at least eight psychotherapy sessions.
HTQ, Harvard Trauma Questionnaire (1–4, 1 best score); HSCL-25, Hopkins somatisation items of Symptom Checklist – 25 (1–4, 1 best score); SI-SCL-90, Somatisation Items of Symptom Checklist – 90 (1–4, 1 best score); SDS, Sheehan Disability Scale (0–30, 0 best score); WHO-5, WHO-Five Well-being Index (0–100, 100 best score); GAF-F/S, the Global Assessment of Functioning, functioning and symptom scale (0–100, 100 best score); HAM-D/A, Hamilton Rating Scale for Depression/Anxiety (0–4, 0 best score).
* $p < 0.05$, *Italic = significant improvement,* Bold = significant difference between the two subsamples: greater treatment outcome for the NI-subsample.

and had been tortured and imprisoned (data on non-completers are not shown).

There were no differences in the pre-treatment characteristics between the participants who were withdrawn and the participants who remained in the study (data on withdrawn participants are not shown).

3.2. Description of the treatment

The treatment conditions for the participants are shown in Table 1. The duration of the multidisciplinary treatment was about one month shorter for the NI-subsample and this subsample participated in approximately one more psychotherapy session compared to the I-subsample.

3.3. Differences in treatment outcome between the two subsamples

Pre- and post-treatment rating scores and the pre-post score differences for each of the two subsamples are illustrated in Table 2. Furthermore, the differences between the pre-treatment scores, the post-treatment scores and the pre-post score differences across the two subsamples are presented. These statistical analyses were based on completers who had also finished both pre- and post-treatment ratings. The number of participants included in these statistical analyses varied between each rating from 436 to 598 participants (see Table 2).

There was a significant difference between the pre-treatment rating scores of the two subsamples on the primary outcome measure HTQ. The NI-subsample had a significant higher pre-treatment rating score on HTQ ($B = -0.13$, $p < 0.01$) reflecting a higher level of PTSD symptoms. There were no significant differences between the pre-treatment rating scores measured on the secondary outcome measures.

Both subsamples had a small, but significant improvement measured on HTQ, WHO-5, GAF-F, GAF-S and HAM-D. Only the NI-subsample had significant improvement measured on HSCL-25, SI-SCL-90 and SDS. Neither of the subsamples had significant improvement measured on HAM-A.

Table 3
Full information maximum likelihood estimation.

Rating	Interpreter	Regression coefficient, *B* (*SE*)	95% confidence interval, *CI*	Beta-coefficient, *b*	*P*
HTQ	a	**−0.10 (0.05)***	−0.19 – −0.02	−0.10	0.02
	b	**−0.14 (0.05)***	−0.23 – −0.05	−0.13	<0.01
HSCL-25	a	**−0.17 (0.05)***	−0.27 – −0.08	−0.15	<0.01
	b	**−0.18 (0.05)***	−0.28 – −0.08	−0.16	<0.01
SI-SCL-90	a	**−0.22 (0.07)***	−0.35 – −0.09	−0.15	<0.01
	b	**−0.20 (0.07)***	−0.33 – −0.06	−0.13	<0.01
SDS	a	**−1.86 (0.62)***	−3.07 – −0.66	−0.13	<0.01
	b	**−2.18 (0.66)***	−3.49 – −0.88	−0.16	<0.01
WHO-5	a	**4.34 (1.89)***	0.63 – 8.05	0.10	0.02
	b	**4.34 (1.97)***	0.49 – 8.20	0.10	0.03
GAF-F	a	1.51 (0.95)	−0.36 – 3.38	0.08	0.11
	b	1.39 (1.01)	−0.58 – 3.37	0.08	0.17
GAF-S	a	1.73 (0.90)	−0.04 – 3.50	0.10	0.06
	b	1.70 (0.93)	−0.13 – 3.53	0.10	0.07
HAM-D	a	−0.71 (0.59)	−1.87 – 0.45	−0.05	0.23
	b	−0.78 (0.63)	−2.02 – 0.45	−0.06	0.21
HAM-A	a	**−1.68 (0.75)***	−3.15 – −0.21	−0.10	0.03
	b	**−1.84 (0.82)***	−3.44 – −0.24	−0.11	0.02

a: The model included: use of interpreter, being Muslim, being married, income, years in Denmark, time in multidisciplinary treatment, number of psychotherapy sessions, coming from Iraq, from Ex-Yugoslavia, from Lebanon, pre-treatment rating scores.
b: The model described above without pre-treatment ratings scores.
* $p < 0.05$, Bold = significant greater treatment outcome for the NI-subsample.

Significantly increased improvement for the NI-subsample compared to the I-subsample were shown on HTQ ($B = -0.13$, $p < 0,01$), HSCL-25 ($B = -0.16$, $p < 0.01$), SI-SCL-90 ($B = -0.19$, $p < 0.01$), SDS ($B = -1.62$, $p < 0.01$), WHO-5 ($B = 3.58$, $p < 0.05$), GAF-F ($B = 2.69$, $p < 0.01$) and GAF-S ($B = 2.73$, $p < 0.01$).

3.4. Multiple linear regression analyses

Based on the preliminary domain analyses the following covariates were significantly associated with treatment outcome on at least one of the rating scales and the use of interpreter: being Muslim, being married, income, length of stay in Denmark, time in multidisciplinary treatment, number of psychotherapy sessions, coming from Iraq, coming from Ex-Yugoslavia, coming from Lebanon. These variables were included in the final multiple regression model and multiple linear regression analyses and FIML were performed. Results of FIML are demonstrated in Table 3.

The FIML-analyses of model A continued to show significantly increased improvement for the NI-subsample compared to the I-subsample measured on HTQ ($B = -0.10$, $p = 0.02$), HSCL-25 ($B = -0.17$, $p < 0.01$), SI-SCL-90 ($B = -0.22$, $p < 0.01$), SDS ($B = -1.86$, $p < 0.01$), WHO-5 ($B = 4.34$, $p = 0.03$). Additionally, a significantly increased improvement for the NI-subsample was measured on HAM-A ($B = -1.68$, $p = 0.03$), while the association between interpreter-status and treatment outcome became non-significant measured on GAF-F ($B = 1.51$, $p = 0.11$) and GAF-S ($B = 1.73$, $p = 0.06$) and continued to be non-significant measured on HAM-D ($B = -0.71$, $p = 0.23$).

The FIML-analyses of model B reflected the FIML-analyses of model A with significantly increased improvement for the NI-subsample measured on HTQ, HSCL-25, SI-SCL-90, SDS, WHO-5 and HAM-A.

The results of the multiple linear regression analyses of model A and B were in line with the results of the FIML-analyses with significantly greater treatment outcome for the NI-subsample measured on HTQ, HSCL-25, SI-SCL-90, SDS, WHO-5 and HAM-A. Additionally, a significant increased improvement for the NI-subsample was measured on GAF-S ($B = 1.88$, $p < 0.05$) in the analyses of model A.

4. Discussion

To our knowledge this study is the largest observational study comparing treatment outcome of interpreter-mediated psychotherapy with treatment outcome of psychotherapy without interpreters in a clinical sample of trauma-affected refugees.

Throughout the different statistical analyses, a significant association between interpreter-mediated psychotherapy and lower treatment outcome was robust across the primary outcome measure HTQ and the secondary self-report ratings, but not across all the observer ratings.

The NI-subsample had a significant higher pre-treatment rating score on HTQ which equates the difference in treatment outcome between the two subsamples as they end up with the same post-treatment rating score. However, when the pre-treatment rating scores were included in the regression model the results continued to show a significant difference in treatment outcome between the two subsamples.

Because the FIML analyses included all available data, these analyses should generate the most representative results. The association between use of interpreter in psychotherapy and lower treatment outcome measured on GAF-F and GAF-S became non-significant when controlling for the covariates and the association remained non-significant measured on HAM-D. These results therefore showed a discrepancy between the self-report ratings and observer-ratings with HAM-A as the exception.

4.1. The discrepancy between self-report ratings and observer-ratings

A previous meta-analysis (Cuijpers et al., 2010) showed discrepancies between observer ratings and self-report ratings in measuring improvement of depression symptoms following psychotherapy. This study showed that effect sizes based on self-report rating measures were smaller than those based on observer-rating measures. Possible reasons for this result were that either self-report ratings are more conservative or that observer ratings are more sensitive to change. This tendency could explain the discrepancy between the observer ratings and the self-report ratings in the current study. Patients in the I-subsample may have rated their improvement more conservative, which resulted in lower treatment outcome measured on the self-report ratings, but not on the observer ratings for this subsample.

Another explanation of the discrepancy between the two measuring methods could be caused by inadequate evaluations of the patients by the clinicians. Despite the effort to ensure reliability by training the medical doctors and the blinded medical students, they may not have been accurate enough in their evaluations. The discrepancy could also reflect that the observer ratings were not sensitive enough to detect the small differences in treatment outcome across the two subsamples.

Despite the observer and self-report discrepancies in the associations between treatment outcome and the use of interpreter in psychotherapy, the results of the primary outcome measure HTQ and the majority of the secondary ratings, including the observer-rating HAM-A, showed that the I-subsample had less improvement in their mental health status compared to the NI-subsample. Previous studies (Schulz et al., 2006; d'Ardenne et al., 2007; Brune et al., 2011; Lambert and Alhassoon, 2015) found no significant difference in treatment outcome depending on the use of interpreter neither measured by observer ratings nor self-report ratings.

The demonstrated difference in treatment outcome between the two subsamples could reflect unregistered characteristics of the participants, the impact of the interpreters on the therapy, interaction between the interpreters and the psychologists or the quality of the interpreting service.

4.2. Characteristics of the participants

Besides the differences between the two subsamples with respect to participant-related factors that were controlled for in the regression

analyses there could be additionally differences on unregistered factors causing the observed pattern of the results. For example, cognitive impairment could lead to both the need for interpreter and difficulties in properly engaging in psychotherapy and thereby getting the full benefit of the treatment. The discrepancies in treatment outcome therefore do not necessary only relate to the need for interpreter assistance but could also reflect other factors influencing psychotherapeutic treatment. A factor, which would be relevant to explore in future studies, could be personality traits, which previously have been reported to be associated with psychotherapeutic treatment outcome (Quilty et al., 2008; Wardenaar et al., 2014; Dermody et al., 2016) and could influence the experience of interpreter-based psychotherapy.

4.3. The interpreter's impact

Interpretation takes time and is likely to reduce the time for therapeutic work. Although we controlled for impact on the results by the number of psychotherapy sessions and the duration of multidisciplinary treatment, it is still worth to consider if lack of treatment outcome could to some extent reflect the time spend on translation. The vocabulary used in the therapeutic setting might have been affected by the interpreter's language abilities which can result in distortions. As previously described interpreters may affect the therapeutic alliance which could have an impact on the treatment outcome. These challenges could therefore also be considered as potential reasons for the limited treatment outcome for the subsample in interpreter-mediated psychotherapy.

4.4. Factors related to the psychologists

As previously established, therapists' contributions to the therapeutic alliance has a significant impact on treatment outcome. Any concerns about working in the interpreter-mediated setting could therefore potentially affect the psychologists' ability to develop the therapeutic alliance and thereby impact the treatment outcome. Based on the findings in this study as well as in previous studies it is important to consider the psychologists' qualifications and experience in working with interpreters.

4.5. The quality of the interpreting service

Interpretation in psychiatric treatment is particularly demanding because the communication is crucial for the assessment, diagnosis and treatment. The results of the current study could reflect inadequate interpreter competence in the psychotherapeutic work even though the interpreters were experienced in translating the psychotherapy sessions.

4.6. Clinical relevance

The patient cohort had a collective limited treatment outcome. This result is in line with previous studies, which also demonstrated limited treatment outcome for the study population (Carlsson et al., 2014; Buhmann et al., 2016; Sonne et al., 2016a; Nygaard et al., 2017; Carlsson et al., 2018). The differences in treatment outcome across the two subsamples were statistically significant, but relatively small. However, the isolated small difference between the two subsamples is considered of clinical importance because the difference becomes relatively large when compared with the overall pre-post treatment changes in the cohort. The subsample without interpreter had at least twice as must improvement on the different outcome measures as the subsample in interpreter-mediated psychotherapy.

4.7. Limitations and strengths

Certain methodological limitations should be mentioned. This study focused solely on the impact of the use of interpreters on the psychotherapeutic treatment, but it should be kept in mind that the participants received multidisciplinary treatment. Despite a similar basic treatment programme across the four PTFs, different interventions were offered. However, when controlling for participation in the different trials there were no significant association with treatment outcome or the need for interpreting service during psychotherapeutic treatment. Although the psychotherapeutic treatment was manualised, a certain amount of variation in the therapeutic intervention is likely to have occurred due to emergent needs of the patients.

Additionally, the association between the individual interpreters and treatment outcome has not been explored. There could be substantial differences across the interpreters' competence which could impact the results of the study.

Some limitations concerning reliability and validity should also be described. The subject of interest did not allow any kind of randomisation or blinding. The allocation to each of the two subsamples throughout the trials was strictly determined by the clinicians' evaluations of the patients' language skills.

Furthermore, the use of self-report and observer ratings in a culturally heterogeneous group of participants will always raise questions regarding the validity and reliability of the measures used (Hollifield et al., 2002; Vindbjerg et al., 2016). This is therefore a general methodological problem in research involving refugee populations. The primary outcome measure HTQ and HSCL-25 have previously been validated in a culturally heterogeneous group of refugees (Mollica et al., 1992; Kleijn et al., 2001), but not for this specific study population. Therefore, the quality of the psychometric rating scales might have been affected by the cultural- and linguistic heterogenicity of the study population.

Lastly, some strengths of the study should be highlighted. Compared to the previous observational studies the sample size in this current study is larger, which generates greater statistical power of the current findings compared to previous findings. Furthermore, the study is built upon a pragmatic inclusion with only few exclusion criteria, which increases the generalisability of the study.

4.8. Recommendations

The results at hand indicate that compensating for linguistic barriers with an interpreter in CBT can introduce challenges in treatment that demand our attention and continued efforts to accommodate these additional complexities. Official best-practice guidelines for mental health professionals working with interpreters are needed to ensure a common framework. These guidelines should include explanation of the interpreting service to the patients so that they are familiar with the service and their legal rights, a description of the interpreter's role, prioritising the clinician's briefings and debriefings with the interpreter and the possibility for interpreters to receive clinical supervision (Tribe and Raval, 2014). Furthermore, there is a need for an authorisation programme for interpreters in Denmark, as seen in Sweden and Norway, to ensure adequate interpreter competence.

In further research, it would be relevant to explore if the difference in treatment outcome is caused by the interpreters' impact in the therapeutic setting or if it is caused by factors, which have not been discovered yet.

Disclosure statement

The authors declare that there are no conflicts of interest.

Funding

This work was supported by the Lundbeck Foundation (grant number R-197-2016-1730). TrygFonden has supported all the randomised trials carried out at CTP.

Acknowledgements

The authors wish to thank Morten Ekstrøm, the head of CTP, as well as the employees at CTP for making this study possible. A special thanks to Cæcilie Böck Buhmann, Charlotte Sonne and Maja Sticker Nordbrandt for sharing data from your trials and your support during the project.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.12.058.

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