

PREDICTORS OF CHRONIC COMBAT-RELATED POST-TRAUMATIC STRESS DISORDER GROUP PSYCHOTHERAPY FAVORABLE OUTCOMES; A PROSPECTIVE COHORT STUDY IN CROATIA

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received: 16.3.2020;

revised: 20.10.2020;

accepted: 16.1.2021

SUMMARY

Background: Combat-related chronic post-traumatic stress disorder (PTSD) is a therapeutically resistant disorder of the fluctuating course. The success of a group psychotherapy is partial. The aim of this paper is to determine baseline characteristics of veterans for whom a group psychotherapy will be the effective psychotherapeutic treatment.

Subjects and methods: We performed this prospective cohort study in two geographically distant institutions: Regional Psychotrauma Center at the Psychiatric Clinic Split, and the Daily Hospital of the Psychiatric Hospital "Sveti Ivan" Zagreb, Croatia. We selected a consecutive sample of 86 veterans with combat-related chronic PTSD admitted to the group psychotherapy during 2009-2012. The primary outcome was $\geq 5\%$ improvement in PTSD symptoms severity measured by Mississippi Scale for Combat-Related PTSD and adjusted for the baseline Mississippi scale score. Predictors were participants' 17 baseline sociodemographic and clinical characteristics and psychological features like personality traits, stress-coping mechanisms, and depression.

Results: We identified two patients' segments with significantly higher likelihood for the favorable treatment outcome. The first one were patients with the low score (≤ 8) on the phobia scale and high score (≥ 7) on the hysterical personality scale. In this segment 100% of patients experienced a favorable treatment outcome. The second one were the patients with a higher score (> 8) on the phobia scale, the low score (≤ 12) on the free-floating anxiety scale and the high score (≥ 8) on the obsession scale. In this segment, 64% experienced the favorable treatment outcome.

Conclusion: The favorable outcome of the group psychotherapy of PTSD symptoms severity in patients with combat-related chronic PTSD can be predicted before the start of the treatment. The favorable outcome should be expected in patients with the low phobia and pronounced hysteria personality traits, or in patients with higher phobia, but with low free-floating anxiety and low obsession.

Key words: PTSD - combat - group psychotherapy - psychotherapy outcome - Croatia

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INTRODUCTION

PTSD appears as a postponed response to exceptionally threatening and distressing traumatic event. Due to its prevalence, fluctuating course, and its consequences on the patient, their families and society, the chronic PTSD presents a therapeutic challenge (American Psychiatric Association 2013, Steenkamp et al. 2015, Cloitre 2015, Richardson et al. 2011, Currier et al. 2014, Bras et al. 2019, Selimbasic et al. 2020). For the last two decades, research has been carried out on the different treatment outcomes, but the results have been relatively inconsistent (Schwartz et al. 2017). However, there is wide consensus that the therapeutic approach should be multidimensional. Although the psychotherapy guidelines favor Cognitive Behavior Therapy and Eye Movement Desensitization and Reprocessing therapy, other psychotherapeutic techniques have also been shown to be effective (National Collaborating Centre for Mental Health (UK) 2005). Between 18% and 50% of patients achieve stable remission within three to seven years, and the treatment success depends on a variety of factors like age, gender or physical and mental comorbidities

(Steinert et al. 2015, Xue et al. 2015). Recovery can be expected in most patients, whereas in a smaller number of patients the course of the disorder may become chronic, cause the psychological or somatic complications over the years, and even progress into a clinical picture of the complex PTSD or enduring personality changes (ICD-10 F62) (Karatzias et al. 2018, Currier et al. 2014). Many studies confirmed the effects of personality traits on the fluctuating course of the disorder (Koffel et al. 2016, Forbes, Creamer, Allen, et al. 2003, Richardson et al. 2011, Lloyd et al. 2014, Schnurr et al. 2004). In veterans with PTSD a markedly higher prevalence of borderline, narcissistic, paranoid, passive-aggressive, and schizotypal personalities were found (Jakšić et al. 2012). Forbes et al. showed that the borderline personality was the strongest, negative, predictor of PTSD treatment outcomes (Forbes et al. 2003). This was supported by the study showing that people with higher level of object relations have better therapeutic alliance and thus better treatment success (Ford et al. 1997). The authors (Xue et al. 2015.) agree that the treatment outcome primarily depends on the type and severity of the traumatic event, although the great importance is given

to the appropriateness of stress-coping strategies. According to the Cognitive theory, there are two basic stress coping strategies: problem-focused and emotion-focused. Endler and Parker introduced the third coping strategy: avoidance (Endler & Parker 1990). The authors state that the avoidant coping may serve as a mechanism through which peritraumatic dissociation contributes to PTSD symptoms (Pacella et al. 2011). Different studies documented a high incidence of comorbid psychiatric disorders to PTSD, the most often: major depressive disorder, then anxiety disorders and addictions (Sofko et al. 2016, Giacco et al. 2013). Along with the psychiatric disorders, there are often a number of somatic illnesses which all contribute to the reduced quality of life and a weaker treatment outcomes (Britvić et al. 2015). Majority of PTSD treatment efficacy studies show the weaker results in the veterans population. Despite some controversial results, the group psychotherapy is considered an optimal treatment for this group of patients (Sloan et al. 2013, Britvić, Radelić 2006, Schnurr et al. 2003, Kezić et al. 2016). Schnurr et al. have shown that the efficacy of treatment does not depend on the type of group psychotherapy used (Schnurr et al. 2003). Foa et al. suggests the use of psychoeducation, support, anxiety control and lifestyle modification, hence all techniques aimed at normalizing stress response and reduction of maladaptive psychobiological processes in which the group psychotherapy plays an important role (Foa et al. 2000). A recent study has shown that the degree of involvement in the group process is a significant predictor of the treatment outcomes in veterans diagnosed with PTSD (Ellis et al. 2014). It can be said that the principle healing mechanism in group are changes of cohesion, interpersonal learning, universality which reduces the feeling of isolation, and the pouring of hope (Yalom 1985).

However, in the era of personalized medicine, we still do not know which group of veterans will experience the positive group psychotherapy outcomes, and which will not. Even so, we do not know which factors can predict the positive outcomes. There are numerous studies of the predictors of outcomes of various techniques such as Cognitive Behavioral or Eye Movement Desensitization and Reprocessing therapies (Wilson et al. 2001, Taylor 2004, Mota et al. 2015), but we are not aware of the studies on the predictive value of the veterans' initial psychological features for the positive outcome of group psychotherapeutic treatment measured by the reduction of PTSD symptoms. The aim of this study was to determine baseline characteristics of veterans for whom a group psychotherapy will be the effective psychotherapeutic treatment option. Our hypothesis was that it is possible to predict the combat-related chronic PTSD group psychotherapy outcome on the basis of the baseline socio-demographic and clinical features, specific personality traits, stress-coping mechanisms, and depression.

SUBJECTS AND METHODS

Study design

We performed this prospective cohort study in two geographically distant Croatian institutions: Regional Psychotrauma Center at the Psychiatric Clinic in coastal regional center Split, and Daily Hospital of the Psychiatric Hospital "Sveti Ivan" in country capital Zagreb. The study protocol was approved by the Ethics Committees of both institutions. We obtained the informed consent from all participants. To protect their anonymity we assigned them with numeric codes at enrolment. All investigators referred to these codes during data collection and analysis and had no knowledge of the participants' identity. Data collection instruments were not asked for personal identification data. We kept the signed informed consent forms separately from the questionnaires and other data collection instruments. The study was performed in accordance with World Health Association Declaration of Helsinki (World Medical Association 2013).

Participants

The targeted population was the Croatian "Homeland War" (1990-1995) veterans with direct combat experience who were diagnosed with combat-related chronic PTSD (ICD-10: F43.12). Inclusion criteria were: confirmed diagnosis of the chronic PTSD, initial traumatic event experienced during combat in the Croatian "Homeland War" in the troops of the Croatian Army, age 32-65 at the time of enrollment, ability to establish interpersonal reliance and willingness to comply with group confidentiality rules what was verified during the initial psychotherapeutic interview, and previously completed a brief individual psychotherapy. Exclusion criteria were central nervous system disorders in status or anamnesis, alcohol or drugs addiction acute psychosis, mental retardation, suicidality or homicidal and aggressive behavior, paranoid thoughts, or sociopathy. The previous treatment with group psychotherapy was not the exclusion criterion.

Needed sample size and type of the sample

Power analysis was performed before the start of the enrollment. Targeted statistical power was 80% and the two-tailed statistical significance $p < 0.05$. Minimal targeted coefficient of determination was set at $R^2 = 0.20$. Under these assumptions the finally needed sample size was determined to be 96 participants. Expecting up to 10% of participants lost for follow-up we decided to enroll 108 participants. The needed sample size was calculated using Hintze, J. (2013). PASS 12. NCSS, LLC. Kaysville, Utah, USA. www.ncss.com. We chose a consecutive sample of patients in the order of their arrival to the exam during the enrollment period.

Intervention

All participants continue to receive their pharmacotherapy in accordance with the guidelines (National Collaborating Centre for Mental Health (UK) 2005). In both centers psychotherapeutic programs were conducted in a small groups of up to 12 members. The psychotherapeutic program was carried out by the same model in both centers, through 40 sessions. During each session, all patients participated in three types of groups: sociotherapy, psycho-educative and psychodynamically oriented small groups led by formally educated and experienced psychiatrists, group therapists. The program took place twice a week, and each group lasted for 60 minutes. The Psycho-Educative Group informed the veterans about different types of symptoms, comorbidities, therapeutic procedures and the possible consequences of symptoms on their professional, social and family life. Initially, the most frequent subjects in the socio-therapeutic group were related to financial problems, obtaining the disabled veteran status and the right to retirement. Later on, solving family and interpersonal communication problems were dominant topics. The participants were encouraged to improve communication with their families, to assume family responsibilities more actively and fulfill their parent and husband roles. The commentaries, support and positive transfers of the group members were crucial for their progress and acceptance of the new forms of behavior. During the dynamic-oriented group, the veterans were encouraged to disclose various types of traumatic experiences during the War and during the post-war period.

Primary outcome

The primary outcome was the $\geq 5\%$ improvement in PTSD symptoms severity measured by Mississippi Scale for Combat-Related PTSD (M-PTSD) and adjusted for the baseline M-PTSD score. (Keane et al. 1988) M-PTSD is the self-reported scale developed in 1984, containing 35 items derived from DSM III criteria (APA 1980), and measuring a spectrum of PTSD symptoms on 5-point Likert scales ranging from "absolutely incorrect" to "absolutely correct". The scale has been revised according to the changes of DSM criteria. Total score ranges from 35 to 175, and it is calculated as the raw sum of the individual items. The data obtained by the initial studies provide empirical evidence of usefulness, sensitivity, specificity, the total accuracy in the range of 90%, internal consistency of $\alpha=0.94$, test-retest reliability of 0.97 and a good convergent validity when compared to the other measures of PTSD symptoms (Keane et al. 1988). As the primary outcome was a self-report scale there was no need for the concealment of the outcome measurement.

Predictors

Sociodemographic predictors were: age, work status dichotomized into two categories as employed vs retired or unemployed, marital status dichotomized as married vs not married or divorced, the number of children, and the time spent in combat units during the war. We collected sociodemographic data during the initial interview using a questionnaire structured specifically for this study. Clinical predictors were number of previous psychiatric hospitalizations, duration of the last psychiatric hospitalization, number of psychiatric comorbidities and diagnosis of the enduring personality changes after catastrophic experience (ICD-10: F62.0). Clinical predictors were recorded during the initial interview and by consulting the hospitals' medical records. Records from the hospital documentation were reevaluated by the psychotherapists during the initial interview. Personality traits were assessed by Crown-Crisp Experiential Index (CCEI) originally developed as The Middlesex Hospital Questionnaire (Crown & Crisp 1966, Crown & Crisp 1979). The overall CCEI score is a measure of general emotionality or neuroticism. The questionnaire is intended to measure anxiety-depression disorders and consists of six subscales that measure: A) free-floating anxiety, P) phobic anxiety, O) obsession, S) somatic anxiety, D) depression and H) hysteria. The index is objective and satisfactorily satisfies two fundamental psychometric conditions: reliability and validity. We measured the severity of depression was using Becks Depression Inventory - Second Edition (BDI-II) (Beck et al. 1996). This self-reporting instrument contains 21 items used to assess the severity of depression in adults and adolescents aged 13 years and older. The overall result is obtained by summing the particular items scores. The theoretical range is from 0 to 63. The average Cronbach coefficient of internal consistency ranges around $\alpha=0.80$ (Jakšić et al. 2013). We assessed the stress-coping mechanisms using The Coping Orientation to Problems Experienced (COPE) (Carver et al. 1989). The questionnaire contains 71 items. The items are grouped into three coping styles: the problem-focused coping, emotion-focused coping and avoidance.

Statistical analysis

As the introductory analysis we performed a series of binary logistic regressions of individual baseline patients' characteristics. The main analysis was performed by classification decision tree (CART). We used the Holm-Bonferroni correction to control the false positive rate caused by the multiple testing. Level of significance was set at two-tailed $p<0.05$, and all confidence intervals at 95%. We performed statistical data analysis using the R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org>.

RESULTS

We assessed 252 veterans for eligibility and excluded 144 (57%) for various reasons (Figure 1). Some of the respondents were not motivated for further participation in the research, while some did not have the capacity for psychological work in the group. Out of 108 patients who started the group psychotherapy, 6 (6%) dropped off before the end. These six patients were comparable to the patients who completed the treatment with regard to M-PTSD score, age, and CCEI

personality profile. The reasons for drop off were relocation in two, and the hospitalization because of somatic illnesses in four cases. Finally, we analyzed the sample of 86 participants. The range of their age was 36 to 65, with the median of 48 (interquartile range 43-55) (Table 1). At the end of the war in 1995, median age of our participants was 27 years, and three of them were minor (<18 years of age). Only three participants had never been hospitalized before the enrollment to our study, and only three had no psychiatric comorbidities.

Table 1. Participants baseline characteristics (n=86)

	Baseline	
Sociodemographic		
Age (years), median (IQR)	48	(43-55)
Work status		
unemployed or retired	61	(70.9)
employed	25	(29.1)
Marital status		
not married or divorced	18	(20.9)
married	68	(79.1)
Number of children		
none	21	(24.4)
1	17	(19.8)
2	36	(41.9)
≥3	12	(14.0)
Time spent in combat units (years), median (IQR)	4	(2-5)
Clinical		
Previous psychiatric hospitalizations		
0-1	51	(59.3)
≥2	35	(40.7)
Duration of the last psychiatric hospitalization (days), median (IQR)	56	(48-66)
Psychiatric comorbidities		
0	3	(3.5)
1	53	(62.4)
≥2	29	(33.7)
Enduring personality changes	33	(38.4)
Beck Depression Inventory-II, median (IQR)	31	(25-38)
Beck Depression Inventory-II		
up to moderate	41	(47.7)
severe	45	(52.3)
Personality traits		
Crown-Crisp Experiential Index, median (IQR)		
A) free-floating anxiety	13	(11-14)
P) phobic anxiety	9	(7-10)
O) obsession	9	(7-10)
S) somatic anxiety	12	(10-15)
D) depression	12	(10-14)
H) hysteria	3	(2-5)
The Coping Orientation to Problems Experienced (COPE), median (IQR)		
problem-focused	59	(49-68)
emotion-focused	24	(20-30)
avoidance	102	(92-112)
Primary coping strategy		
problem-focused	29	(33.7)
emotion-focused	15	(17.4)
avoidance	42	(48.8)

Data are presented as number (percentage) of participants if not stated otherwise;

Abbreviations: IQR = interquartile range; SSRI = selective serotonin reuptake inhibitors; SNRI = serotonin and norepinephrine reuptake inhibitors

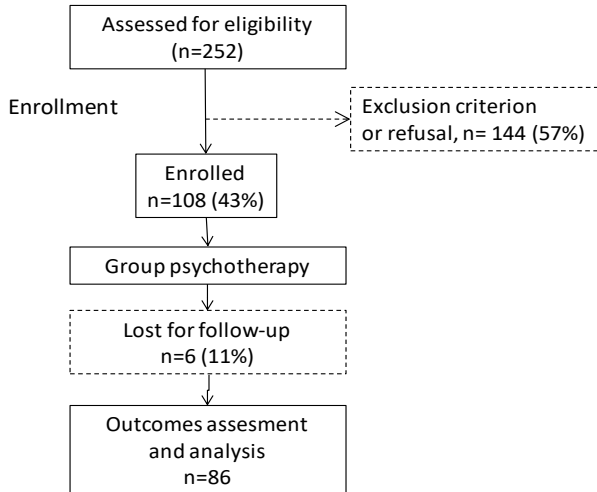


Figure 1. Study flow

After the treatment, median M-PTSD score was significantly lowered for median of 6 (95% CI 0.2-11.8; Wilcoxon signed-rank test, $p=0.003$) points from 143 (131-150) before the treatment to 137 (126-149) after the treatment. This was the relative decrease in median M-PTSD score of 4%. Any improvement in PTSD symptoms was experienced by 59 (69%) of patients. One patient experienced no change, and 26 (30%) experienced worsening of symptoms. Our targeted favorable outcome, the reduction of M-PTSD score for $\geq 5\%$, was experienced by 23 (27%) of participants. Univariate binary logistic regression revealed two baseline characteristics that were significantly associated with this outcome (Table 2). Every unit increase in the baseline Beck Depression Inventory-II score was associated with significant lowering of odds for the favorable outcome (OR=0.91; 95% CI 0.87-0.97; $p=0.002$). Every unit

Table 2. Unadjusted odds ratios for $\geq 5\%$ improvement of PTSD symptoms severity after the therapy by baseline, pre-treatment, patients characteristics (n=86)

	OR	Univariate, unadjusted (95% CI)	p
Sociodemographic			
Age (years)	1.01	(0.95-1.08)	0.671
Work status			
unemployed or retired	1		
employed	1.09	(0.39-3.10)	0.866
Marital status			
not married or divorced	1		
married	0.48	(0.16-1.45)	0.196
Number of children			
none	1		
1	0.54	(0.11-2.565)	0.435
2	1.25	(0.39-4.04)	0.709
≥ 3	0.50	(0.08-2.99)	0.448
Time spent in combat units (years)	1.15	(0.83-1.59)	0.396
Clinical			
Previous psychiatric hospitalizations			
0-1	1		
≥ 2	1.49	(0.57-3.90)	0.417
Duration of the last psychiatric hospitalization (days)	1.00	(0.98-1.03)	0.853
Psychiatric comorbidities			
0-1	1		
≥ 2	1.07	(0.39-2.92)	0.900
Enduring personality changes			
no	1		
yes	0.35	(0.12-1.05)	0.061
Beck Depression Inventory-II	0.91	(0.87-0.97)	0.002
Personality traits			
Crown-Crisp Experiential Index			
A) free-floating anxiety	0.83	(0.66-1.04)	0.104
P) phobic anxiety	0.81	(0.67-0.99)	0.041
O) obsession	1.08	(0.88-1.31)	0.470
S) somatic anxiety	0.88	(0.75-1.03)	0.120
D) depression	0.93	(0.78-1.09)	0.354
H) hysteria	1.05	(0.86-1.29)	0.622
The primary Coping strategy (COPE)			
problem-focused	1		
emotion-focused	0.60	(0.15-2.34)	0.457
avoidance	0.39	(0.13-1.13)	0.082

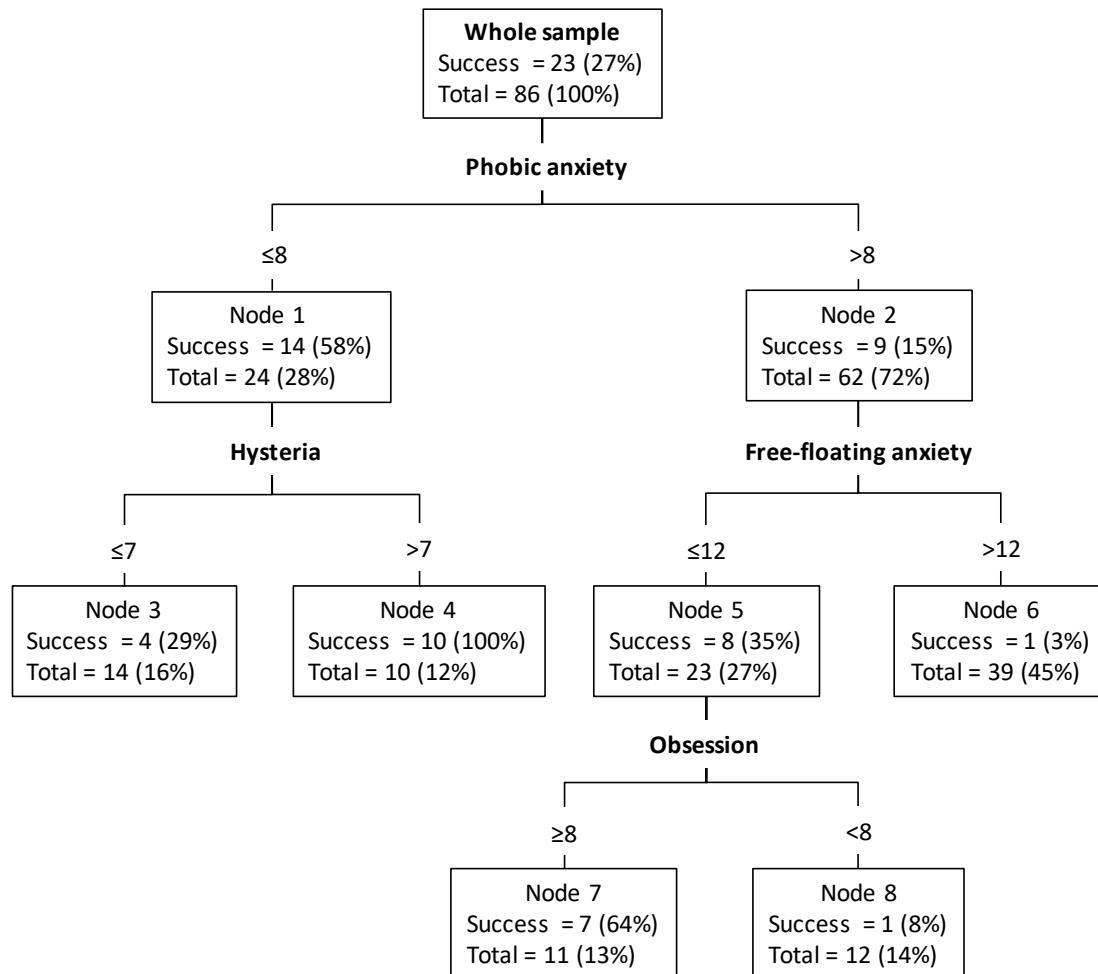


Figure 2. Classification and regression tree (CART) of all predictors to the treatment success defined as the lowering of M-PTSD score for $\geq 5\%$; data are presented as number (percentage) of participants; “Total” represent the share particular node has in the total sample

increase in the Crown-Crisp Experiential Index phobic anxiety scale score was associated with significant lowering of odds for the favorable outcome (OR=0.81; 95% CI 0.67-0.99; $p=0.041$).

Based on the CART analysis, 88% of respondents were correctly classified to the treatment success group who experienced $\geq 5\%$ reduction in M-PTSD score. By the CART method we identified two patients’ segments with a highest likelihood of M-PTSD decrease after the group psychotherapy. The first segment with the highest likelihood for the reduction in the intensity of PTSD symptoms by more than 5% were participants with the low score (≤ 8) on the phobia scale and high score (≥ 7) on the hysterical personality scale (Node 4 on the Figure 2). This segment was 12% of all patients large. In this segment, all (100%) of participants achieved the PTSD symptoms severity improvement of $\geq 5\%$ from the baseline values. Patients in this segment comprised 44% of all patients who had at least 5% of PTSD symptoms improvement after the therapy. The second group of patients with the high likelihood of reducing the intensity of the PTSD symptoms were patients with a higher score (>8) on the phobia scale, the low score

(≤ 12) on the free-floating anxiety scale and the high score (≥ 8) on the obsession scale (Node 7 on Figure 2). In this segment, 64% had the improvement of PTSD symptoms of at least 5%. This segment was 13% of all patients large, and 30% of those who had a symptom reduction of at least 5% after the therapy.

DISCUSSION

Our study shown that the favorable outcome of the group psychotherapy of PTSD symptoms severity in patients with the combat-related chronic PTSD can be predicted before the start of the treatment. The favorable outcome should be expected in patients with the low phobia and pronounced hysteria personality traits, or in patients with higher phobia, but with the low free-floating anxiety and low obsession.

Comorbid psychiatric disorders have previously been found to be a negative predictor of the chronic PTSD treatment outcomes (Forbes et al. 2003). In our sample only 3.5% of participants did not have any psychiatric comorbidity. Such a high comorbidity rate can be explained by the fact that some twenty years

after the Homeland War healthcare is actively sought by veterans with stubborn and severe clinical pictures that despite the longer elapsed time still have a serious symptoms. This is also apparent from relatively high M-PTSD and BDI-II scores, as well as from relatively long median duration of the previous hospitalization. Increased obsessiveness may indicate the association between obsessive-compulsive disorder and PTSD and the existence of their functional association in the theoretical, empirical and clinical sense. Several studies indicated the overlap of these two disorders, and the so-called obsessive-compulsive post-traumatic disorder has been described (Huppert et al. 2005, Gershuny et al. 2003). Studies of a memory impairment have shown a common disorder in a regulatory inhibitory memory mechanisms responsible for the clinical manifestations of PTSD and obsessive-compulsive disorder (Brewin & Smart 2005). The increase in somatic manifestations of anxiety are in line with a research suggesting the association of PTSD and somatoform disorder (van der Kolk et al. 1996, Spitzer et al. 2009) what can also partially explain some of our results. But an interesting and the new result is that veterans with pronounced somatic anxiety and hysterical personality traits achieve a better therapeutic outcomes. Nowadays neglected concept of hysterical personality trait, according to the psychodynamic theory indicates the use of defense mechanisms of repression and dissociation. The importance of dissociative phenomena in the clinical picture of PTSD is indicated by the fact that the specific form of dissociative PTSD was introduced in the DSM-5 (American Psychiatric Association 2013). Theoretically, it may be assumed that people who use these defense mechanisms have a larger potential for the symptoms suppression, what may appears as the reduction of manifested PTSD symptoms, and the better treatment outcome. Psychotherapeutic work on traumatic experiences may contribute to the reduction of dissociation and in that sense to the reduction of manifested symptoms. Another plausible explanation is that the group psychotherapy is the treatment of choice for a person with hysterical personality traits (Forbes et al. 2010, Foulkes 1978). Patients with hysterical personality traits have a better level of functioning and achieve a better therapeutic alliance, and thus the better treatment outcomes, as our study has shown (Jakšić et al. 2012, Miller 2003). Seemingly contradictory findings with both low and high phobia scores as predictors of favorable treatment outcomes are consistent with the results of Forbes et al. (2003) study that found a better treatment outcomes in subjects with initially higher anxiety, that is those with a higher level of anger.

The interpretation of our results should respect several limitations of our study. First, because of the available sample size we could not validated the results on the independent sample. The future studies should do this, and before the independent validation our study

findings could not be translated into the clinical practice. The second limitation was caused by our study design. We performed a prospective cohort study with no control group treated with different psychotherapeutic or other approaches. For this reason we can not claim that our findings are specific for the group psychotherapy. This limitation affects only theoretical interpretations of our results, but it is not relevant for the eventual future clinical application. Also, limitation in study design is somewhat outdated self-reported instruments (M-PTSD and CCEI). Third, by power analysis conducted before the data collection, we targeted the minimum needed sample size to respect the total available population size and technical and financial constraints. However, the final sample size prevented us from in-detail post-hoc, sub-group analysis and precise yet reliable probing for interactions.

CONCLUSION

The favorable outcome of the group psychotherapy of PTSD symptoms severity in patients with combat-related chronic PTSD can be predicted before the start of the treatment. The more prevalent favorable outcome should be expected in patients with the low phobia and pronounced hysteria personality traits, or in patients with higher phobia, but with low free-floating anxiety and low obsession. Appropriate selection of patients for the group psychotherapy will increase the favorable outcomes, and shorten the time to the proper other therapeutic options for the patients whose group therapy outcomes are not expected to be satisfying. With an Individualized Approach and the proper screening we may prevent a further worsening of the disorder.

Acknowledgements: None.

Conflict of interest: None to declare.

Contribution of individual authors:

Slobodanka Cvitanušić: data collection, first draft, manuscript revisions.

Dolores Britvić: study design.

Igor Filipčić & Tanja Frančičković: approval of the final version.

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