

## **Brainspotting – the efficacy of a new therapy approach for the treatment of Posttraumatic Stress Disorder in comparison to Eye Movement Desensitization and Reprocessing**

Anja Hildebrand<sup>1</sup>, David Grand<sup>2</sup>, Mark Stemmler<sup>1</sup>

<sup>1</sup> Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany

<sup>2</sup> Trainer and developer of Brainspotting, psychotherapeutic practice in New York City, USA.

Email Corresponding author: [anja.hildebrand@fau.de](mailto:anja.hildebrand@fau.de)

### Abstract

*Objective:* This study aims at determining the efficacy of the new therapy approach Brainspotting (BSP) in comparison to the established Eye Movement Desensitization and Reprocessing (EMDR) approach for the treatment of Posttraumatic Stress Disorder (PTSD). *Method:* The sample consisted of 76 adults seeking professional help after they have been affected by a traumatic event. Clients were either treated with three 60-minute sessions of EMDR (n=23) or BSP (n=53) according to a standard protocol. Primary outcomes assessed were self-reports of the severity of PTSD symptoms. Secondary outcomes included self-reported symptoms of depression and anxiety. Assessments were conducted at pretreatment, posttreatment and 6 month after the treatment. *Results:* Participants in both conditions showed significant reductions in PTSD symptoms. Effect sizes (Cohen's *d*) from baseline to posttreatment concerning PTSD related symptoms were between 1.19 - 1.76 for clients treated with EMDR and 0.74 - 1.04 for clients treated with BSP. *Conclusion:* Our results indicate that Brainspotting seems to be an effective alternative therapeutic approach for clients who experienced a traumatic event and/or with PTSD.

Keywords: Posttraumatic stress disorder, therapy research, treatment efficacy, Eye Movement Desensitization and Reprocessing, Brainspotting

### Introduction

Posttraumatic Stress Disorder (PTSD) is defined as “a delayed or protracted response to a stressful event or situation (of either brief or long duration) of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone” (World Health Organization, 1992, p. 147). In general, the range for lifetime PTSD lies between a low of 0.3% in China to 6.1% in New Zealand (Kessler & Üstün, 2008). Current past year PTSD prevalence was estimated at 3.5% (Kessler, Chiu, Demler, Merikangas, & Walters, 2005), with 1.8% among men and 5.2% among women (National Comorbidity Survey, 2005). The prevalence of full or partial PTSD in the primary care medical setting is reported with 12% of the primary care attendees (Stein, McQuaid, Pedrelli, Lenox, & McCahill, 2000). The presence of PTSD is positively correlated with higher levels of health-related problems (Schnurr & Green, 2004) and lower levels of functioning (Thorp & Stein, 2005). Moreover, PTSD is often a persistent and chronic disorder (Perkonig et al., 2005). Thus, effective treatments for PTSD are needed.

There are different treatment approaches to reduce the symptoms of PTSD. Some already existing approaches were specially modified for the treatment of traumatic experiences, e.g., trauma-focused cognitive-behavioral therapy (Benkert, Hautzinger, & Graf-Morgenstern, 2008). Others are developed primarily for the treatment of PTSD, e.g., Eye Movement Desensitization and Reprocessing (EMDR, Shapiro, 2001), Narrative Exposure Therapy (NET, Schauer, Neuner, & Elbert, 2011) or Brainspotting (BSP, Grand, 2013).

In an early meta-analysis by van Etten and Taylor (1998), the most effective drug therapies as well as the best psychological therapies, namely EMDR and behavior therapy, were found equally effective. Later, at least four other meta-analyses confirmed that EMDR is empirically proven to be the best treatment for PTSD in addition to the cognitive-behavioral therapies (Bisson & Andrew, 2007; Bisson, Roberts, Andrew, Cooper, & Lewis, 2013; Bradley, Greene, Russ, Dutra, & Westen, 2005; Maxfield & Hyer, 2002; Seidler & Wagner, 2006).

Primary aims of the present study were to compare the efficacy of Brainspotting with the established EMDR-therapy and to detect areas of significant change or lack of change (program evaluation). Outcomes assessed were the severity of PTSD symptoms as well as the symptoms of depression and anxiety.

## Methods

### Design and Sample

The data for this multicenter longitudinal study were collected by independent psychotherapists in Germany, the United States of America, Austria, Switzerland and Italy. The therapists were previously informed about the study by mail or during EMDR and BSP trainings. If the therapists were interested in participating, they were instructed by mail and/or phone and then received a package with all study material.

The treatment and data collection was carried out by 27 experienced trauma therapists. There was a pre-determined standard protocol for both EMDR and BSP, which the therapists had to follow during their treatment. Therapists were licensed therapists who were fully educated in EMDR through an accredited training facility and they had at least completed the Phase I training in Brainspotting. Thus, clients were able to choose whether they would be treated with the established therapy approach EMDR or the new therapy approach BSP. In case the client chose BSP and the therapy outcome was not satisfactory, he/she had the right to receive additional EMDR sessions. None of the clients have taken up this offer.

Data was collected before the first therapy session, after one week after the third therapy session and after about half a year ( $M=6$  month; range: 2-12 month, with 69% were conducted after 5, 6 or 7 month). The sample is composed of 76 consecutive clients (79% female; mean age 42.0 years) starting their therapy between 2009 and 2015. The inclusion criteria were: a) adult clients aged 18 and over; b) the client have either experienced a traumatic situation and / or suffer from a posttraumatic stress disorder or acute stress disorder; and c) the client gives his written consent to participate in the study. The client was deemed not eligible for the study when the treatment already included more than the preparatory sessions. Between the posttest and the follow-up assessment no treatment of the trauma under focus was applied. Only counseling or supportive sessions were possible and if needed another trauma might be treated. Finally we collected data of 53 clients treated with BSP and 23 clients treated with EMDR. The study was reviewed and approved by an ethics committee of the University of Bielefeld. Informed consent was obtained from all research participants being involved in this research after the study and the procedures were explained.

#### Treatment

The Therapy Approach Eye Movement Desensitization and Reprocessing (EMDR). EMDR was developed by Francine Shapiro (2001). It is a well-established therapy for the treatment of PTSD or other trauma associated diseases. EMDR consists of eight phases, from which phases three to six are original EMDR stages. After establishing a good therapist-client relationship and after the introduction of relaxation techniques or other stabilization techniques, the client is asked to re-experience the traumatic situation while focusing on the therapist's finger tips which are moving on a horizontal axis in front of his or her eyes. In a safe environment and as part of a good therapeutic relationship, the client relives the traumatic situation and reprocesses the feelings, emotions, cognitions and body sensations connected to the trauma (Schubbe, 2006).

The Therapy Approach Brainspotting (BSP). BSP is a psychotherapeutic model discovered in 2003 by David Grand, Ph.D.. Grand has conceptualized BSP as brain-wise and body-aware relational attunement process. In this context he has developed the model of the Dual Attunement Frame. The foundation of this model is the articulation of the attuned, relational presence of the therapist with the client. This relational attunement is seen as being both focused and deepened by the neurological attunement derived from observing and harnessing different aspects of the visual orienting reflexes of the client (Corrigan & Grand, 2013).

By slow eye tracking, either with one eye or with two eyes, locations for BSP are identified. To find these locations, the techniques of either "Inside Window" or "Outside Window" can be used. The "Inside Window" utilizes the client's felt sense, the "Outside Window" helps to locate this location by observation of clients' reflexive response such as blinks, eye twitches or wobbles or quick inhalation, by the therapist.

Once the therapist and client determine together the Brainspot, the client is directed to maintain their fixed visual attention on the position and mindfully observe their internal process. In BSP this is called Focused Mindfulness as the mindfulness that ensues occurs in a state of Focused Activation. The Focused Mindfulness ensues, with the therapist closely and openly following along until the client comes to a state of resolution.

BSP is a focused treatment method that works by identifying, processing and releasing core neurophysiological sources of emotional/body pain, trauma, dissociation and a variety of other challenging symptoms (Grand, 2011). In BSP, the therapist is encouraged to openly follow the client's process with no assumptions. The therapist is guided to trust the innate human neurological capacity for self-regulation given optimal conditions. In this context, the BSP

therapist also guides the client to become brain-aware through ongoing opportunities for psycho-education. For a more detailed description of BSP, the reader may consult Grand (2013). The standardized protocol determines the usage of “two eyes” and the “Inside Window”.

First results indicate that Brainspotting could be an effective therapy approach for the treatment of clients having experienced traumatic experiences and clients with generalized anxiety disorder (Anderegg, 2016; Hildebrand, Stemmler, & Grand, 2015; NSHCF, 2016).

#### Measures

PTSD and symptom severity. To screen the clients for the presence of PTSD and to assess the symptom severity and functioning of the clients the Posttraumatic Diagnostic Scale (PDS; Ehlers, Steil, Winter, & Foa, 1996; Foa, Cashman, Jaycox, & Perry, 1997) was administered. The PDS has 49 items. It includes a 12 item checklist identifying potentially traumatizing events experienced by the respondent. Respondents then indicate which of these events has troubled them most in the last month. To determine whether the DSM-IV stressor criteria are met, the response to this event at the time of its occurrence should be rated. Clients then rate 17 items representing the cardinal symptoms of PTSD experienced in the past 30 days on a four-point scale (0-3). In the last part respondents indicate the level of impairment caused by their symptoms across nine areas of life functioning. By adding up the scores of the corresponding items, the symptom severity for the three subscales re-experiencing (5 items), avoidance/numbing (7 items) and hyperarousal (5 items) is calculated. The total symptom severity score is obtained by adding up the responses of selected items and ranges from 0 to 51 (1-10 = mild, 1-20 = moderate, 21-35 = moderate to severe, > 36 = severe).

Additional mental impairment. Additional mental impairment was investigated through the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). This self-rating scale measures states of depression and anxiety and features seven questions for anxiety (HADS-A) and seven for depression (HADS-D). The respondent rates each item on a four-point scale. The scores for the subscales range from 0 to 21.

Demographic data. Data included sex, date of birth, marital status, place of residence, socioeconomic status (0=low, 1=average, 2=high), traumatic experience (item “How would you describe the client’s trauma?”) with a five point rating scale with the response categories from 1 (minor) to 5 (major) and ICD-10/DSM-IV diagnosis of the client.

#### Data Analysis

Analyses were conducted using SPSS 23. Independent samples t-tests and  $\chi^2$ -analyses were conducted to determine whether there were

statistically significant differences between the means of those treated with BSP and those treated with EMDR on the demographic variables. We used univariate two factor analysis of variance (ANOVA) with repeated measures and  $\chi^2$ -tests to assess treatment effects. Effect sizes were calculated according to Cohen's (1988) d statistic. For each scale of the PDS and HADS and for each treatment group the magnitude of change from pre-to posttest, from pre-to follow-up and from posttest to follow-up was defined as  $(M1-M2)/SD_{pooled}$ , where  $SD_{pooled} = [(SD1^2+SD2^2)/2]^{1/2}$ . Positive effect sizes represent improvements in PTSD and other symptoms (depression, anxiety). Negative effect sizes indicate a worsening of symptoms. The sample sizes for the different items vary slightly due to missing data.

## Results

### Demographic Data and Traumatic Experiences

Demographic data. Results of  $\chi^2$ - and t-test analyses comparing those treated with BSP and those treated with

EMDR indicated no statistically significant differences regarding gender, age, family status and PTBS diagnosis – except place of residence (Table 1).

- Table 1 – Appendix 1

Traumatic experiences. Both groups of clients most frequently listed as the worst traumatic experience an event that is not explicitly mentioned in the PDS (EMDR: 48%, BSP: 37%, examples: working with death bodies, psychological abuse). Accidents were marked by 17% of the clients treated with EMDR and 23% treated with BSP. Sexual assault by someone known was listed by 22% of the EMDR clients and 18% of the BSP clients. The other traumatic events were each marked by less than 10% of the client group. Differences between groups concerning the worst traumatic event were not statistically significant ( $\chi^2 [9, N = 75] = 5.11, p = .825$ ).

### Outcome Measures

PDS. Table 2 summarizes the means and standard deviations of the PDS for the pretest, posttest and follow-up for both treatment groups. The results of the univariate two factor analysis of variance (ANOVA) with repeated measures and

the effect sizes are also listed. We found a significant time effect in all four scales of the PDS, showing a decrease in the reported symptoms for both treatment

groups. We did not find a significant interaction effect, revealing no significant differences between the groups concerning the decrease of symptoms. Pre-follow-up effect sizes for the measures of PTSD symptoms for both EMDR ( $d = 1.11 - 2.12$ ) and BSP treatment ( $d = 1.06 - 1.36$ ) were high. The same applies to pre-post effect sizes for EMDR ( $d = 1.19 - 1.76$ ) and BSP ( $d = 0.74 - 1.04$ ).

- Table 2 – Appendix 2

HADS. Results for the HADS are presented in table 3. Clients treated with EMDR as well as clients treated with BSP reported a significant decline in symptoms of anxiety and depression. The between groups tests indicate that the variable treatment group is not significant for both scales. Moreover, the interaction of time and group is not significant which means that the groups are not changing in different ways over time.

Pre-follow-up effect sizes for the HADS were high.

- Table 3 – Appendix 3

## Discussion

We aimed to investigate a comparison between treatment outcomes in clients treated with EMDR and BSP. The latter is a new psychotherapy approach which theorizes that the field of vision can be used to locate eye positions that correlate with relevance to inner neural and emotional experience (Grand, 2011). With a growing recognition of BSP as an alternative treatment approach for PTSD, this study helps to support the need for the evaluation of treatment efficacy.

We found that clients treated with BSP weren't more impaired than clients treated with EMDR in the variables under consideration. Brainspotting seems to be an effective therapeutic approach for clients who experienced a traumatic event and/or with PTSD. Additionally, BSP seems to be as effective as EMDR in many areas under examination (cardinal symptoms of PTSD, anxiety and depression). In this vein, our study supports the results of Sack et al. (2016) who compared dual attention, eye movements, and exposure only during EMDR in a randomized clinical trial. The use of eye movements as a dual-attention task had no additional treatment effects compared to visual fixation on a nonmoving hand. The pre-post effect sizes for the EMDR treatment group in our study are comparable to other findings (Bradley et al., 2005; Maxfield & Hyer, 2002; van Etten & Taylor, 1998), where effect sizes for pre- versus post-treatment comparisons range between  $-.50$  and  $2.22$ . Even though the pre-post effect sizes for BSP were apparently a bit smaller, there was no significant difference between groups concerning the treatment outcome in either of the scales.

Our study had a longitudinal and quasi-experimental design with two equivalent comparison groups. According to the Maryland Scientific Method Scale (SMS; Sherman et al., 1997), which evaluates the methodological quality of studies, our study is positioned at level 3 on a 5-point scale. The authors indicate that confidence in the results is highest at level 5 and level 3 is required to achieve reasonably accurate results. As differences between groups were analyzed and not statistically significant, threats to internal validity were minimized. For example, regression towards the mean (Stigler, 1997) could be precluded, as there were no group differences for example in the trauma severity score at pretest.

#### Limitations of the Present Study

Although improvements in symptoms of PTSD have been observed with BSP, we can only state preliminary conclusions on the benefits of this intervention due to the relatively small sample size. Thus, more research with larger samples is needed to replicate our results.

Another limitation of this paper is that we did not use a randomized trial. As randomized controlled trial is often considered the gold standard in evaluating treatment efficacy (Misra, 2012), we also thought about using this design. Due to organizational and ethical issues (Edwards et al., 1998; Sullivan, 2011), we decided that clients should have the possibility to choose whether they are treated with EMDR or BSP.

Both, EMDR and BSP were successful in treating clients with traumatic experiences. Therefore, the common factors in the two treatment approaches and, in general, for all effective trauma therapies should be taken into consideration (Wampold, 2015). Both treatments start with the anamnesis and therapy planning (Schubbe, 2014). In both treatments, the personality and particular attributes of the therapist, the therapeutic relationship, the need of establishing personal safety and stability, and the reprocessing of the traumatic experience could have for example affected treatment outcome. In our study we did not focus on these moderators of treatment outcome. In sum, the development of trauma treatment methods include more and more resource orientation, and BSP follows this overall direction (Schubbe, 2016).

#### Conclusions and Future Prospects

To conclude, our study supports the use of BSP to treat subjects who show symptoms of PTSD. Thus, BSP seems to be an alternative treatment approach for clients with PTSD. More research is needed to replicate our results and to evaluate effects in different samples, e.g., clients with substance use disorders and comorbid PTSD. Moderator analyses are necessary to further evaluate the contribution of BSP to the treatment of PTSD. Further studies should also analyze the potential usefulness of BSP with other diagnostic measures like the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5, Weathers et al., 2013).



## References

1. Anderegg, J. (2015). *Effective treatments for generalized anxiety disorder*. Unpublished manuscript available from the Rocky Mountain Brainspotting Institute at <http://rockymountainbrainspottinginstitute.com/wp-content/uploads/2014/07/Effective-treatments-for-generalized-anxiety-disorder.pdf>
2. Benkert, O., Hautzinger, M., & Graf-Morgenstern, M. (2008). *Psychopharmakologischer Leitfaden für Psychologen und Psychotherapeuten* [Psychopharmacological guide for psychologists and psychotherapists]. Heidelberg: Springer Medizin Verlag.
3. Bisson, J. I., & Andrew, M. (2007). Psychological treatment of post-traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews*, 3, Art. No.: CD003388.
4. Bisson, J. I., Roberts, N. P., Andrew, M., Cooper, R., & Lewis, C. (2013). Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. *Cochrane Database of Systematic Reviews*, 12, Art. No.: CD003388.
5. Bradley, R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A Multidimensional Meta - Analysis of Psychotherapy for PTBS. *American Journal of Psychiatry*, 162, 214-227. doi: 10.1176/appi.ajp.162.2.214
6. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
7. Corrigan, F., & Grand, D. (2013). Brainspotting: Recruiting the midbrain for accessing and healing sensorimotor memories of traumatic activation. *Medical Hypotheses*, 80, 759-766. doi: 10.1016/j.mehy.2013.03.005
8. Edwards, S. J. L., Lilford, R. J., Brauholtz, D. A., Jackson, J. C., Hewison, J., & Thornton, J. (1998). Ethical issues in the design and conduct of randomised controlled trials. *Health Technology Assessment*, 2(15), 1-132.
9. Ehlers, A., Steil, R., Winter, H., & Foa, E. B. (1996). *Deutsche Übersetzung der Posttraumatic Stress Diagnostic Scale (PDS)* [German translation of the Posttraumatic Stress Diagnostic Scale]. Oxford: Department of Psychiatry, Wamford Hospital, University of Oxford.

10. Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The Validation of a Self-Report Measure of Posttraumatic Stress Disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment*, 9, 445-451. doi: 10.1037/1040-3590.9.4.445

11. Grand, D. (2011). Brainspotting. Ein neues duales Regulationsmodell für den psychotherapeutischen Prozess [Brainspotting, a new brain-based psychotherapy approach]. *Trauma & Gewalt*, 5(3), 276-285.

12. Grand, D. (2013). *Brainspotting: The Revolutionary New Therapy For Rapid and Effective Change*. Boulder, CO: Sounds True.

13. Hildebrand, A., Grand, D., & Stemmler, M. (2015). Zur Wirksamkeit von Brainspotting - Ein neues Therapieverfahren zur Behandlung von Posttraumatischen Belastungsstörungen [The efficacy of Brainspotting – a new therapy approach for the treatment of Posttraumatic Stress Disorder]. *Trauma - Zeitschrift für Psychotraumatologie und ihre Anwendungen*, 13(1), 84-92.

14. Kessler, R. C., Chiu, W. T., Demler, O., Merikangas, K. R., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62, 617-627. doi: 10.1001/archpsyc.62.6.617

15. Kessler, R. C., & Üstün, T. B. (Eds.). (2008). *The WHO World Mental Health Surveys: global perspectives on the epidemiology of mental disorders*. New York: Cambridge University Press.

16. Maxfield, L., & Hyer, L. (2002). The Relationship between Efficacy and Methodology in Studies Investigating EMDR Treatment of PTSD. *Journal of Clinical Psychology*, 58, 23-41. doi: 10.1002/jclp.1127

17. Misra, S. (2012). Randomized double blind placebo control studies, the “Gold Standard” in intervention based studies. *Indian Journal of Sexually Transmitted Diseases*, 33, 131-134. doi: 10.4103/0253-7184.102130

18. National Comorbidity Survey (2005). *NCS-R appendix tables: Table 1. Lifetime prevalence of DSM-IV/WMH-CIDI disorders by sex and cohort. Table 2. Twelve-month prevalence of DSM-IV/WMH-CIDI disorders by sex and cohort*. Accessed at: <http://www.hcp.med.harvard.edu/ncs/publications.php>

19. NSHCF Newtown-Sandy Hook Community Foundation. Inc. (2016). *Report of Findings from the Community Survey*. Report available from the

Newtown-Sandy Hook Community Foundation. Inc. at <http://www.nshcf.org/wp-content/uploads/2016/09/2016-NSHCF-Community-Assessment-Report.pdf>

20. Perkonig, A., Pfister, H., Stein, M. B., Höfler, M., Lieb, R., Maercker, A., & Wittchen, H.-U. (2005). Longitudinal Course of Posttraumatic Stress Disorder and Posttraumatic Stress Disorder Symptoms in a Community Sample of Adolescents and Young Adults. *The American Journal of Psychiatry*, *162*, 1320-1327. doi: 10.1176/appi.ajp.162.7.1320

21. Sack, M., Zehl, S., Otti, A., Lahmann, C., Henningsen, P., Kruse, J., & Stingl, M. (2016). A Comparison of Dual Attention, Eye Movements, and Exposure Only during Eye Movement Desensitization and Reprocessing for Posttraumatic Stress Disorder: Results from a Randomized Clinical Trial. *Psychotherapy and Psychosomatics*, *85*, 357-365. doi: 10.1159/000447671

22. Schauer, M., Neuner, F., & Elbert, T. (2011). *Narrative Exposure Therapy (NET). A Short-Term Intervention for Traumatic Stress Disorders*. Cambridge/Göttingen: Hogrefe & Huber Publishers.

23. Schnurr, P. P., & Green, B. L. (Eds.). (2004). *Trauma and health: Physical health consequences of exposure to extreme stress*. Washington: American Psychological Association.

24. Schubbe, O. (2006). EMDR. In M. Zobel, (Ed.), *Traumatherapie – Eine Einführung [Trauma therapy – An introduction]* (pp. 86-111). Bonn: Psychiatrie Verlag.

25. Schubbe, O. (2014). EMDR, Brainspotting und Somatic Experiencing in der Behandlung von Traumafolgestörungen [EMDR, Brainspotting and Somatic Experiencing in the treatment of posttraumatic stress disorders]. *Psychotherapeutenjournal*, *13*(2), 156-163.

26. Schubbe, O. (2016). Wachstumsorientierung in der Traumatherapie [Growth Orientation in Trauma Treatment]. *Trauma und Gewalt*, *10*(3), 206-217.

27. Seidler, G. H., & Wagner, F. E. (2006). Comparing the efficacy of EMDR and trauma-focused cognitive behavioral therapy in the treatment of PTSD: a meta-analytic study. *Psychological Medicine*, *36*, 1515-1522. doi: 10.1017/S0033291706007963

28. Shapiro, E. (2001). *Eye Movement Desensitization and Reprocessing (EMDR): Basic Principles, Protocols, and Procedures* (2nd ed.). New York: The Guilford Press.

29. Sherman, L. W., Gottfredson, D., Mackenzie, D., Eck, J., Reuter, P., & Bushway, S. (1997). *Preventing Crime: What Works, What Doesn't, What's Promising*. (Report to the United States Congress). Washington, D.C.: National Institute of Justice.

30. Stein, M. B., McQuaid, J. R., Pedrelli, P., Lenox, R., & McCahill, M. E. (2000). Posttraumatic stress disorder in the primary care medical setting. *General Hospital Psychiatry, 22*, 261-269. doi: 10.1016/S0163-8343(00)00080-3

31. Stigler, S. M. (1997). Regression toward the mean, historically considered. *Statistical Methods in Medical Research, 6*, 103-114. doi:10.1191/096228097676361431

32. Sullivan, G. M. (2011). Getting Off the "Gold Standard": Randomized Controlled Trials and Education Research. *Journal of Graduate Medical Education, 3*, 285-289. doi: 0.4300/JGME-D-11-00147.1

33. Thorp, S. R., & Stein, M. B. (2005). Post-traumatic stress disorder and functioning. *PTSD Research Quarterly, 16*(3), 1-7.

34. Van Etten, M. L., & Taylor, S. (1998). Comparative efficacy of treatments for post-traumatic stress disorder: A meta-analysis. *Clinical Psychology and Psychotherapy, 5*, 126-144. doi: 10.1002/(SICI)1099-0879(199809)5:3<126::AID-CPP153>3.0.CO;2-H

35. Wampold, B. E. (2015). How important are the common factors in psychotherapy? An update. *World Psychiatry, 14*, 270-277. doi: [10.1002/wps.20238](https://doi.org/10.1002/wps.20238)

36. Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). *The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5)*. Interview available from the National Center for PTSD at [www.ptsd.va.gov](http://www.ptsd.va.gov).

37. World Health Organization (1992). *The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines*. Geneva: WHO.

38. Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety And Depression Scale. *Acta Psychiatrica Scandinavica*, *67*, 361-70. doi: 10.1111/j.1600-0447.1983.tb09716.x

## Appendix 1

**Tab. 1. – Comparisons of Demographic information of treatment groups.**

	BSP ( <i>n</i> = 53)		EMDR ( <i>n</i> = 23)		$\chi^2$ or <i>t</i>
	<i>M</i> or <i>n</i>	<i>SD</i> or %	<i>M</i> or <i>n</i>	<i>SD</i> or %	
Gender (female)	41	77.4	19	82.6	.27
Age (years)	43.43 (range: 22-69)	12.30	38.74 (range: 19-58)	12.90	-1.51
Marital status					7.00
Married	19	36.5		26	
Engaged	1	1.9		0	
Cohabiting	12	23.1		13	
Divorced	8	15.4		22	
Single	12	23.1		30	
Other	0	0		9	
Place of residence					13.63**
Germany	33	62.3	14	60.9	
USA	20	37.7	4	17.4	
Austria		0	3	13.0	
Switzerland		0	1	4.3	
Italy		0	1	4.3	
Socioeconomic status					0.63
Low		26		23	
Average		65		62	
High		9		15	
Trauma severity score	4.78 (range: 2-5)	3.72	4.22 (range: 2-5)	0.85	-0.72
PTSD diagnosis by therapist <sup>a</sup>					.04
Simple PTBS	21	42.9	10	45.5	
Complex PTBS	28	57.1	12	54.5	
PTSD diagnosis by PDS (yes)	29	54.7	15	65.2	.725
Additional diagnosis (yes)	23	43.4	8	34.8	.49

Note. BSP = Brainspotting; EMDR = Eye Movement Desensitization and Reprocessing. <sup>a</sup>BSP: N=4 missing, EMDR: N=1 missing. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Appendix 2

**Tab. 2. – PDS. Univariate two factor analysis of variance (ANOVA) with repeated measures and effect sizes**

	Pre		Post		FU		ANOVA			<i>d</i>		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	time <i>F</i> (2, 59) $\eta^2$	group <i>F</i> (1, 60) $\eta^2$	time*gro up <i>F</i> (2, 59) $\eta^2$	<i>d</i> <sub>Pre-FU</sub>	<i>d</i> <sub>Pre- Post</sub>	<i>d</i> <sub>Post -FU</sub>
(EMDR: n=18, BSP: n=42)												
Total score							44.16*** .60	.26 .00	2.03 .07			
EMDR	29.4	12.67	10.4	10.42	8.0	6.52				2.12	1.64	0.28
BSP	25.9	12.36	14.6	10.59	10.9	10.59				1.30	0.98	0.35
Reexperience							44.08*** .60	1.61 .03	1.31 .04			
EMDR	8.8	4.33	2.4	2.77	1.7	1.81				1.11	1.76	0.30
BSP	8.5	4.62	4.3	3.39	3.0	3.35				1.36	1.04	0.39
Avoidance							37.15*** .56	.11 .00	1.64 .05			
EMDR	11.3	5.48	4.6	5.77	2.6	2.83				1.99	1.19	0.44
BSP	9.8	5.69	5.8	5.17	4.0	4.49				1.13	0.74	0.37
Hyperarousal							31.00*** .51	.04 .00	2.72 .08			
EMDR	9.3	4.28	3.3	3.20	3.7	3.12				1.50	1.59	- 0.12
BSP	7.6	3.66	4.5	3.03	3.8	3.54				1.06	0.92	0.21

Note. PDS = Posttraumatic Diagnostic Scale; pre = pretest, post = posttest, FU = follow-up; BSP = Brainspotting; EMDR = Eye Movement Desensitization and Reprocessing. *M*=mean; *SD*=standard deviation. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . Effect sizes: Cohen (1988):  $(M_1 - M_2) / SD_{pooled}$

## Appendix 3

**Tab. 3. – HADS. Univariate two factor analysis of variance (ANOVA) with repeated measures and effect sizes**

	Pre		Post		FU		ANOVA			<i>d</i>		
(EMDR: n=18, BSP: n=43)	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	time <i>F</i> (2, 58) $\eta^2$	group <i>F</i> (1, 59) $\eta^2$	time*group <i>F</i> (2, 58) $\eta^2$	<i>d</i> <sub>Pre-FU</sub>	<i>d</i> <sub>Pre-Post</sub>	<i>d</i> <sub>Post-FU</sub>
Anxiety							44.38*** .62	.13 .01	0.89 .02			
EMDR	14.1	4.67	7.1	5.50	6.8	4.93				1.52	1.37	0.06
BSP	12.5	3.55	7.0	4.12	6.8	5.03				1.31	1.43	0.04
Depression							35.83*** .55	.15 .00	1.31 .04			
EMDR	11.1	5.13	5.4	5.68	4.7	5.32				1.22	1.05	0.13
BSP	9.5	4.96	5.3	4.79	4.9	4.80				0.94	0.86	0.08

*Note.* HADS = Hospital Anxiety and Depression Scale; pre = pretest, post = posttest, FU = follow-up; BSP = Brainspotting; EMDR = Eye Movement Desensitization and Reprocessing. *M*=mean; *SD*=standard deviation. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . Effect sizes: Cohen (1988):  $(M_1 - M_2) / SD_{pooled}$



