# A retrospective evaluation of depression outcomes following Eye Movement Desensitisation and Reprocessing versus Trauma-Focused Cognitive Behavioural Therapy in a UK primary care psychological service

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## Contents

**Abstract**

Approximately half of individuals respond to existing interventions for depression inadequately (Hendriks et al., 2018).

This study evaluated depression outcomes following a course of EMDR versus TF-CBT in a UK National Health Service primary care psychological therapy service.

This study had a quantitative quasi-experimental retrospective outcome evaluation design with two independent groups - the intervention group (EMDR) and the active control group (TF-CBT). A total of 581 clients met the criteria for this study. All clients in this study have been receiving TF-CBT or EMDR to address their PTSD. However, the focus of this study was the impact of TF-CBT versus EMDR on depressive symptoms. PHQ-9 and PCL-5 self-report measures were used as the outcome measures. ANCOVA and t-tests were performed to analyse the data.

EMDR was found to produce statistically significantly better depression and PTSD treatment outcomes and to require statistically significantly smaller treatment doses.

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## Literature review

### Depression: a silent global pandemic

Major depressive disorder (MDD) is a debilitating mental illness. In the Diagnostic and Statistical Manual of Mental Disorders DSM-5 (APA, 2013), a major depressive episode is defined by the presence of either depressed mood or anhedonia (i.e. the inability to feel pleasure), as well as at least another four of the following symptoms, within a two week period: feelings of worthlessness or guilt, fatigue or loss of energy, insomnia or hypersomnia, decreased or increased appetite or weight, diminished ability to think or concentrate, psychomotor agitation or retardation, and thoughts of death or suicidal ideation. These symptoms cause distress or impairment in occupational, social or other areas of functioning. It is important to note that the DSM-5 definition characterises depression in a dichotomous fashion, whereas the severity of depression symptoms is a continuous variable that can also fluctuate in intensity (Tolentino et al., 2018).

Depressive disorders have been found to be the most prevalent and disabling conditions of all, according to the World Health Organisation (WHO, 2012). It has been estimated that at least 350 million individuals worldwide are affected by depressive disorders. The prevalence might be even higher, as depression can be under-reported and under-recognised by professionals, as well as by individuals themselves, due to stigma, lack of awareness or acceptance (Falagas et al., 2007). Moreover, it has been found that the COVID-19 pandemic has further increased the prevalence of depression (Hawes et al., 2021). The course of depression is often recurrent, with 75%-90% of individuals experiencing more than one major

depressive episode over their lifetime (APA, 2000). Besides, the children of depressed mothers are 3-6 times more likely to develop depression than their peers of mothers without depression (Gotlib et al., 2020). Approximately 10% of individuals become chronically depressed, which is characterised by continuous depression for two consecutive years, which, in turn, often leads to significant psychosocial disability and cognitive functional impairment (Duval et al., 2022; Keller et al., 1997).

Depression is also closely linked with suicide. 90% of individuals who have died by suicide experienced depression (Cassidy et al., 2014; Reynolds et al., 2012). Nearly one million people die by suicide each year globally (Greden, 2001). The aftermath of a suicide can be traumatic, not only for the bereft families but also for the public or the emergency workers involved (Witczak-Błoszyk et al., 2022). Additionally, depression is also a risk factor for cardiovascular disease (and associated risk of death), as well as for smoking, diabetes and obesity (Almas et al., 2015; Shulman & Shapiro, 2008). Cardiac disease is the leading physical cause of death across the globe, with a high burden of disease for the healthcare system (WHO, 2021). As the most common mental health condition, depression poses significant challenges to the healthcare system and economy globally (with associated poorer physical health, work disability, inpatient admissions and early retirement) (WHO, 2017). The lifetime prevalence of depression is estimated to be up to 20% (Kessler & Bromet, 2013), which can significantly reduce the quality of life of individuals suffering from depression, as well as those around them.

**Current conceptualisations of depression**

Depression is understood to be a multifactorial condition with biopsychosocial factors that include epigenetics, biological susceptibility, personality traits, predisposing temperament, social and family systems, as well as exposure to stressful and traumatic events (Duval et al., 2022). Various conceptualisations of depression exist, such as psychodynamic theories (Freud, 1917), the monoaminergic hypothesis (Schildkraut, 1965), the learned helplessness model (Abramson et al., 1978), the diathesis-stress model (Beck, 1987), the kindling hypothesis (Post, 1992), an interpersonal model (Klerman & Weissman, 1994) and more. TF-CBT will be used in this study in the Treatment as Usual (TAU) control condition, as it is recommended by the National Institute for Health and Care Excellence (NICE) (2022) and employed by NHS as the first-line treatment of depression and PTSD. TAU is the typical standard care that a client suffering from depressive symptoms would receive in a clinical setting. In this study, standard care for clients with depressive symptoms in this service is CBT. Therefore, TAU CBT is used as a control group in this study to compare the effectiveness of an EMDR against the currently available options. Essentially, TAU represents the "usual" way depressive symptoms are addressed in NHS primary care Talking Therapies services. The cognitive model is based on the notion that early experiences contribute to the formation of the negative cognitive triad (core beliefs about self, world and future), schemas (rules for living, assumptions and attitudes), and cognitive distortions. These cognitions may lie dormant and then become activated by external events, resulting in overly negative interpretations and conceptualisations of benign stimuli to fit dysfunctional schemas (Beck et al., 2024). As this study analyses PHQ-9 scores in the context of PTSD, TF-CBT developed by Ehlers and Clarke (2000) was

employed in this study's interventions to fairly compare it to EMDR, which is currently recommended only for PTSD. It is argued that one of the main active ingredients of TF-CBT appears to be exposure to and processing of the traumatic memory, cognitive re-appraisal of the meaning or interpretations of the trauma and its sequelae, as well as reclaiming life (Forbes et al., 2007).

To date, depressive illness has been treated with pharmacotherapy, a wide range of individual and systemic psychotherapies, guided self-help, physical exercise, inpatient admissions within clinical services, and a variety of other cultural, spiritual and/or religious practices outside of statutory services (Duval et al., 2022; Bonelli et al., 2012; Spilka et al., 1985; Bosch et al., 2015; Chiluveri et al., 2020). Depending on the intervention type, over 50% of individuals recover following these interventions. However, approximately half of individuals tend to respond to all these interventions inadequately (Bart et al., 2016; Hendriks et al., 2018). Furthermore, relapse and recurrence rates after these treatments are high: more than 75% of treated individuals suffer from subsequent recurrent depressive episodes (Fostick et al., 2010), and 40-50% of individuals relapse within the first year of treatment completion (Hollo et al., 1992).

**Aetiology of depression**

It is important to explore the root causes of depression – is it cognitive distortions, as argued by Beck (1987) or traumatic life events, or perhaps both? Both psychotherapy and pharmacotherapy can improve rates of remission; nevertheless, the success rates of currently available treatments are still limited, and for some individuals, they are not effective. Robins and Block (1989) evaluated multivariate

interactional representations of cognitive and helplessness models in a sample of 83 undergraduates, looking at predictors of depression. Participants completed the Dysfunctional Attitudes Scale at the start of the semester. After 4-8 weeks, they completed the Life Events Inventory, the Perceptions of Events Questionnaire, the Attributional Style Questionnaire and the Beck Depression Inventory. They found that both person and event variables played a role in depression. However, perceptions of upsetting real events had the strongest correlates with depressive symptoms. The frequency of such adverse events was associated with these perceptions. This suggests that objective real-life events seem to play a significant role in depression. Although this study had a small, homogenous sample size and lacked a control group, their findings are in line with meta-analyses (Buckman et al., 2021; LeMoult et al., 2020). This raises the question of whether perceptions of events are distorted or accurate. Hence, this could indicate possible substantial limitations of the cognitive model alone, which is used as the first-line treatment of depression. If an individual had actual traumatic experiences, then there can be considerable limits in how much one can view the perceptions arising from these traumatic events from a more balanced, realistic perspective, which oftentimes are some of the aims of cognitive therapy. Cognitions of a depressed individual might be proportionally realistic and balanced. This might indicate the objective role of life events. These experiences might have been traumatic for the person, and intrusive memories can linger, resulting in rumination, which can often be one of the common bidirectional features of depression (Whisman et al., 2020).

A systematic review by Beijers et al. (2019) included 29 publications that identified data-driven subtypes of depression based on biological or clinical features, with

approximately 4000 participants. The review indicated that there might be different subtypes of depression, with some of the following factors possibly contributing to different individual presentations: a disturbance in neurotransmitter levels, inflammation, weight gain or loss, response to treatment, biomarker profiles, functional connectivity, structural differences, or childhood abuse. Although these findings should again be taken with caution due to the lack of power in individual studies, methodological differences, and a lack of replication of the studies reviewed, this review raises the question about the potential vast variety of lived experiences under the umbrella term of 'depression'. Therefore, it is important to consider whether traumatic events or unprocessed traumatic memories might be key components of depression for some individuals.

Indeed, it is identified that some types of depression are related to trauma in childhood and tend to be chronic and treatment-resistant, with limited response to treatment as usual (Mandelli et al., 2015; Kaplan & Klinetob, 2000). Sar (2015) proposed a new concept for this type of depression, calling it dissociative depression. Sar found that trauma-focused psychotherapy was effective for this subtype. Although there are numerous causes and factors maintaining depression (Fu et al., 2009; Schotte et al., 2006; Dobson et al., 2011; Wittkowski et al., 2014), there seems to be a consensus that one of the major risk factors for depression are traumatic events. Nearly 90% of psychiatric patients have experienced traumatic events, compared to 50% of the general population (Schalinski et al., 2016).

The relationship between traumatic events and depression is complex, however, and the impact of traumatic experiences is mediated by various factors:

neurobiological, epigenetic, endocrine, immunological, social and psychological (Carletto et al., 2021). Pharmacotherapy tends to be less effective than psychotherapy in individuals with traumatic experiences (Nemeroff et al., 2003). Consequently, trauma-associated depression has been proposed as a distinct subtype requiring a different approach (Minelli et al., 2019) to address key traumatic components of this subtype.

**What is trauma?**

The word "trauma" originates from Greek, literally meaning "wound," and refers to a wound with a laceration. At the outset, this term was used in psychiatry and psychology to indicate the overwhelming effect of a stimulus on the person's ability to cope (Perrotta, 2019). The widely accepted definition of "psychological trauma", provided by the French psychologist Pierre Janet, identifies it as one or more events that can alter the individual's psychic system, threatening to fragment mental cohesion (Van der Kolk & Van der Hart, 1989). The traumatic event can be of various types – "big T" or "small t" traumas. The former tend to be *life*-threatening in nature, such as a natural disaster, catastrophic accident, domestic violence, physical or sexual assault, serious illness, combat or terrorism. The latter tend to be *ego*-threatening in nature, such as bullying, harassment, emotional neglect or abuse, humiliation, family difficulties, loss of relationships, or financial deprivation (Shapiro, 2001). If these wounding events are not processed by the individual's psyche, neural network and body, this can become a chronic disturbance. It might include feelings of emptiness and despair, hostility and derealisation, loss of coherence in the representation of oneself, irritability, emotional dysregulation,

deliberate self-injury, or personality, eating, sleeping, relationship or attachment difficulties (Wheeler, 2007). It can result in a specific post-traumatic stress disorder (PTSD) or other challenges – physical or psychological (Perrotta, 2019). Difficulties consistent with PTSD have been documented for centuries (Kilpatrick et al., 1998). However, after World War II, the American Psychiatric Association produced DSM-I, which included "gross stress reaction" (APA, 1952), then named PTSD in DSM-III (APA, 1980). In the most recent DSM-5 (APA, 2013), PTSD criteria entail direct or witnessed exposure to a traumatic event, specifically violent and sudden "actual or threatened death, serious injury, or sexual violence" (APA, 2013, p. 217). Notably, other adverse life events that do not involve an immediate threat to life or serious injury (e.g., job loss or divorce) or nonviolent deaths are not considered as trauma according to this definition (Pai et al., 2017). These very specific criteria do not include many traumas that might be considered small "t" and can still cause a lot of distress to an individual. Nevertheless, other criteria for PTSD are subsequent avoidance, intrusions, numbing, alterations in mood, cognition, arousal and reactivity. It is important to note that factor analytic research has indicated a significant overlap of PTSD and depressive symptoms (Rosen et al., 2008), raising a question of how different these disorders actually are.

**Potential role of trauma in depression**

Adverse childhood experiences (ACEs) have been repeatedly identified as a predisposing factor for depression (Laugharne, 2010). What constitutes such adversities tends to be subjective and varied, so it is not limited to just PTSD criteria. However, it can include objectively less life-threatening events, such as

neglect and bullying (Larsen & Pacella, 2016). Adverse childhood and adolescent experiences have been found to be one of the major factors in recurrence, persistence and resistance to depression treatments (Nelson et al., 2017). Neuroscientific studies have also indicated changes in autobiographical memory systems in depressed individuals (Vinograd & Craske, 2020). Following trauma, negative memories appear to become more salient than positive or neutral memories. Everyday memories tend to become less detailed and more overgeneralised. Since past experiences serve as an important basis for dealing with new situations, this might create latent vulnerability, which in turn can increase the risk of depression (Liu et al., 2013). Meta-analyses suggest that overgeneralised autobiographical memory might be a predictor of depression (Sumner et al., 2010; Mihailova & Jobson, 2018), indicating a potential need to target traumatic memories to relieve depression.

Although the association between ACEs, trauma and depressive symptoms has been consistently established, there is not a straightforward way to treat this in individuals presenting with depressive symptoms in the absence of PTSD. One of the common results of ACEs tends to be difficult memories of such events (NHSE, 2023). Intrusive memories can be prevalent in individuals with symptoms of depression (Payne et al., 2019). In turn, rumination about past events is a common occurrence in depressed individuals (Dickson et al., 2012). Hence, targeting these memories could be key for relieving depressive symptoms in some individuals (Below & Derakshan, 2020; Payne et al., 2019).

**Wider perspectives on depressive symptoms and trauma**

It is important to acknowledge that the DSM-5 medicalises human conditions into disease-like categories (Patel & Rapley, 2011). Diagnostic criteria might have merits, such as allowing individuals to access support. However, there is a danger of mislabelling common human reactions such as sadness or melancholy as a disorder, thus pathologising human reactions to social injustice, discrimination, childbirth, or loss (Wardrope, 2015). This, in turn, permits the "treatment" of these "disorders" with medications that can benefit Big Pharma (Frances, 2013). Individuals then receiving these "treatments" can suffer from side effects (Bet et al., 2013), whereas the social problems that are causing the sadness remain unaddressed. Thus, the way these symptoms are addressed tends to be individualistic and reductionist (Davis & González, 2016).

The proposed project views depression as potentially a human reaction to traumatic experiences. Such experiences could be discrimination, alienation, bullying, loss, aggression, or others, perhaps because of poverty or immense social injustice. In turn, these traumatic experiences might not have been processed and may linger as traumatic memories. Unfortunately, it might take an endlessly long time to achieve a more just society (Boylan, 2004). In the meantime, it might be possible to start reducing human suffering by helping individuals process and heal traumatic memories that might lead to justifiable sadness, hopelessness, and despair (Connolly, 2011). In addition, DSM language might not capture these symptoms in some populations (Akinyemi et al., 2018). There are a variety of non-Western approaches to understanding and overcoming depression and trauma (e.g., traditional Chinese medicine, ayurveda, yoga, meditation, religious practices, etc). EMDR might be a particularly useful cross-cultural intervention, as it is non-

verbal and, hence, does not rely as much on language or Western culture and has even been successfully used in dogs (Kaptjein et al., 2021), as neuroanatomy that is arguably involved in EMDR is relatively similar in various mammals (Vermeire et al., 2011).

Some studies have also suggested that TF-CBT is not as effective for clients from racial and ethnic minorities, so alternative approaches and considerations are needed (Walling et al., 2012; Arroyo et al., 2003; Chui et al., 2007). EMDR, however, demonstrated effectiveness across a wide range of cultural contexts and served culturally marginalised populations worldwide (Nickerson, 2022). EMDR principles can be attuned to an individual's cultural context.

**Eye movement desensitisation and reprocessing (EMDR) and its development**

In 1987, Shapiro recognised the relationship between eye movements and distressing memories. This resulted in the development of a treatment protocol she named Eye Movement Desensitisation (EMD). Shapiro (1989) posited that the EMD process was related to the Rapid Eye Movement (REM) in sleep and its effects. Later, Shapiro added the word “reprocessing” as she further developed an understanding that desensitisation was only a part of this therapy, whilst the broader effects could be better understood through information processing theory (Shapiro, 2001).

The most prominent theory of the mechanism of action behind EMDR is based on the Adaptive Information Processing (AIP) model proposed by Shapiro (Shapiro, 2018). According to AIP, unprocessed traumatic memories underly various

psychiatric disorders, including PTSD, mood disorders such as depression, chronic pain and drug addiction (Hill, 2020). The premise of the AIP model is that a lot of psychological difficulties can be a consequence of traumatic experiences. Resultant emotions, images, cognitions, and physical sensations are stored in the nervous system at the time of the event. EMDR therapy makes that stored material accessible whilst simultaneously activating the natural processing system (Shapiro, 2007). Although the mechanism of the healing process is not entirely empirically understood, the hypothesis is that due to bilateral stimulation, symptoms diminish due to new connections being established in the neural network between stored distressing information and other existing, more healthy information and perceptions (Solomon & Shapiro, 2008). Bilateral stimulation is the purposeful engagement of both brain hemispheres and sensory systems to perturb maladaptive neural organisation that arguably can often occur following traumatic events that are exceedingly overwhelming to be processed and stored in long-term memory as regular events (McNamee, 2006). When traumatic memories are unprocessed, they can be triggered by external or internal stimuli, resulting in intrusive symptoms of PTSD and other psychological illnesses (Hase et al., 2018). EMDR helps to reprocess traumatic memories using bilateral stimulation, primarily eye movements and a dual focus of attention. This helps to transform these memories and integrate them into existing semantic links (Hase et al., 2017).

However, it is important to note that the mechanism of action of EMDR, and AIP in particular, are not fully understood. The AIP theory was invented to conceptualise the discovered changes in individuals with trauma following EMDR. According to the AIP model, maladaptively stored traumatic memories obstruct the effective

processing of information in the prefrontal cortex. Bilateral stimulation is thought to complete the processing of the memory, thereby reducing trauma symptoms. The evidence base supporting the validity of AIP theory is in its infancy, with only emerging studies measuring physiological changes occurring during EMDR therapy (Hill, 2020). Notably, advances in the fields of neuroscience and psychotherapy adopted a proposition that it might be the deconsolidation of old pathogenic memory structures and incorporation of novel emotional information that allows memory reconsolidation to occur and update memories into more adaptive (Goldman & Fredrick-Keniston, 2020). Therefore, at this stage, the exact change mechanism in EMDR might be inconclusive.

**EMDR protocol**

The standardised three-pronged EMDR protocol entails accessing and processing memories of disturbing past events, current situations triggering distress, and imaginal future templates (Shapiro, 2001). The eight-phase EMDR protocol begins with history taking in phase one, which also entails collaborative identification of the targets – such as unprocessed memories of traumatic events, also known as large “T” trauma (Shapiro, 2001) and other recurrent or cumulative distressing life events, also known as small “t” trauma (Shapiro, 2001). Current situations and future desired outcomes also can be EMDR processing targets. This phase is followed by preparation phase two, which aims to enable the client to develop sufficient stability to engage in reprocessing.

Subsequently, in phase three, each target memory and its affective, cognitive and sensory components are accessed. The client establishes associated images, emotions, body sensations, negative cognitions and a desired positive cognition.

Subjective Units of Distress (SUD) (Wolpe, 1990) are used to measure progress in trauma processing, where “zero” is the absence of any distress and “ten” is the worst imaginable distress. Validity of a more positive Cognition in reference to the event (VOC) (Shapiro, 2001) is also rated, where “one” is untrue at all and “seven” is entirely true. In phase four, the processing and desensitisation of the distress happens using bilateral stimulation, intending to gradually reduce the SUD rating to zero. Phases five and six aim to eliminate remaining distressing material, strengthen adaptive networks, and strengthen the VOC of the positive cognition. In phase seven, the client is brought to equilibrium and guided on how to manage symptoms in between EMDR sessions. The next session is commenced with phase eight, which aims to reevaluate the previous sessions’ work and the overall treatment plan.

**Current applications of EMDR**

Various treatments exist to address the impact of trauma. Both TF-CBT and Eye Movement Desensitisation and Reprocessing (EMDR) are NICE-recommended first-choice therapies for PTSD (NICE, 2018). One of their main aims is to process traumatic memories (La Greca, 2008). Both TF-CBT and EMDR are effective for PTSD; however, EMDR tends to require fewer sessions for significant reductions in trauma symptoms (Jaberghaderi et al., 2004; Rodenburg et al., 2009; Gauhar, 2016).

EMDR has a significant evidence base for its effectiveness in the treatment of PTSD (Mavranezouli et al., 2020), and there are some promising studies investigating its effects on depressive symptoms in the presence of PTSD (Schneider et al., 2008; Valiente-Gómez et al., 2017; Perlini et al., 2020). However, the impact of EMDR on depressive symptoms has not been evaluated in a primary care clinical setting.

The National Health Service (NHS) primary care psychological service Talking Therapies (TT) in the UK is designed to offer evidence-based treatments for individuals suffering from depression, anxiety and PTSD, free at the point of use. It is important for treatments for depression to be effective within a real-life clinical setting, not just controlled studies. To promote social justice, it is also important that effective treatments for depression are freely available to the public. Otherwise, individuals from lower socio-economic classes might not be able to access effective treatments for depression (Leppänen et al., 2022).

**The current state of knowledge of EMDR for depressive symptoms**

EMDR for depression has been under study for some time, beginning with a promising case study on intensive EMDR for depression back in 2011 (Grey, 2011). Grey (2011) conducted a mixed-methods case study evaluating the qualitative and quantitative effectiveness and impact of intensive EMDR on a client presenting with depressive symptoms as well as panic with agoraphobia. The standard eight-phase EMDR protocol was followed, and the first two phases were delivered over three sessions on a weekly basis. However, the remaining phases, three to eight, were delivered three times per week, with twelve ninety-minute sessions. One-month and three-month follow-up sessions were also provided. The intensive EMDR

produced significant improvement in all quantitative measures: Beck Depression Inventory-II (BDI-II) (Beck et al., 1996), Beck Anxiety Inventory (BAI) (Beck et al., 1988), subjective units of distress and validity of cognition (Shapiro, 1989). Qualitative analysis also revealed marked improvement in functioning, energy, work performance, communication, social activity, appetite and weight. The main limitation of this study is the single case design; hence, the lack of generalisability is due to the lack of sample size. However, this allows for a more in-depth understanding of the impact and effects of the intervention. It is also important to note that the researcher was the treatment provider, creating a conflict of interest and a lack of blinding, therefore increasing the chance of confirmation bias and higher investment of the treatment provider. Nevertheless, the threat to validity was reduced due to adherence to a standardised EMDR protocol and objective measures.

A meta-analysis and systematic review by Dominguez et al. (2021) examined 11 RCTs with 567 participants in total, using EMDR, trauma-focused therapies and imagery rescripting for depression. They found moderate effect sizes, with EMDR demonstrating superior outcomes to non-trauma-focused CBT as an active control group. They found that both EMDR and imagery rescripting demonstrated superior outcomes to inactive control conditions. Follow-up data was also most favourable for EMDR, with a moderate effect size, although only four studies included a follow-up between one to six months post-treatment. EMDR protocols used in these studies, as well as session duration and intensity, varied. Several studies were also at a high risk of bias and had small samples. Therefore, while promising, the results of this meta-analysis should be taken with caution, as only one study used an active

control group, with the remaining studies having inactive control conditions. The main critique of this extensive study is that it is a review of efficacy and not effectiveness - that is, the studies under review, like most of the studies reviewed below, were RCTs and did not capture real-life practice data. The current study is novel because it evaluates actual outcome data from current clinical practice and so is more ecologically valid.

Furthermore, Perlini et al. (2020) conducted a bibliographical search. They found fifteen studies in which EMDR has been applied to treat depression, as well as bipolar affective disorder, in individuals with or without PTSD. EMDR lead to significant improvement in several psychometric measures of trauma and depressive symptoms, such as BDI, BDI-II, BAI, Impact of Events Scale-revised (IES-R, Christianson and Marren, 2012), and PHQ-9. However, the sample sizes in the studies were small. Carletto et al. (2021) conducted a systematic review and meta-analysis of studies with a controlled design investigating the effects of EMDR on depression. Independent reviewers selected eleven studies for qualitative synthesis and nine studies with 373 total participants for meta-analysis. They found an overall large effect size on quantitative depression measures upon treatment completion and a moderate effect size at 3-6 months follow-up and in studies with active control groups. Nonetheless, most studies had small sample sizes.

Raissouni et al. (2023) conducted a systematic literature review. They found that EMDR is effective in improving the symptoms of various difficulties in children, including PTSD and major depression. Some limitations of their review include that they only searched two databases, “PubMed” and “Google Scholar”, potentially

missing some studies. Nevertheless, they concluded that studies with larger samples were required. Finally, Meredith et al. (2023) conducted a study in a UK National Health Service offering EMDR to healthcare professionals. Amongst other outcome measures, analysis of pre- and post- scores on the Patient Health Questionnaire-9 (Kroenke et al., 2001) revealed statistically significant improvements in measures of depression. The service was also rated highly for accessibility and experience on the qualitative feedback survey. The perceived effectiveness of EMDR was variable in the qualitative feedback; nevertheless, symptoms and sickness absence were reduced, and improvements made during therapy were reportedly maintained. However, this study lacked a control group, which limits the extent to which the outcomes can be attributed to the intervention rather than other factors.

A more recent mixed methods service evaluation by Kaptan et al. (2023) also found online EMDR led to a statistically significant and reliable change on all quantitative measures employed in the current study – PHQ-9, Generalised Anxiety Disorder-7 (GAD-7), Work and Social Adjustment Scale (W&SAS) and PCL-5. Thematic analysis of the qualitative questionnaires from 22 individuals indicated meaningful qualitative themes such as “pleasantly surprised”, “challenging but worthwhile”, and “what needs to be done next”. The EMDR intervention included 83 clients over the age of sixteen presenting with trauma-related difficulties, not limited to PTSD. It is important to note that clients with childhood trauma, neglect, dissociation and difficulties that are better addressed by other services were excluded due to only 4-8 remote sessions being offered, which might be insufficient for more complex presentations. One of the significant limitations of this study was that only one

therapist was involved in delivering this EMDR intervention, which might suggest that therapist factors could play a significant role in outcomes, potentially limiting the applicability of these findings. Randomisation, statistical power calculation, and control groups were also absent, further limiting generalisability. As it was an evaluation of one service, it is also not possible to translate these findings to the general population. Hence, more and larger service evaluations of this nature are required.

As can be seen, there is a growing body of evidence around EMDR for depression, but it is not without its methodological challenges. In addition, Hofmann et al. (2016) described an EMDR therapy protocol DeprEnd© that addresses a crucial origin of depression which might be perpetuating depression: pathogenic memory networks, which are neurophysiological networks that store memories of adverse life experiences that have been inadequately processed and are maladaptively stored in the brain (Hase et al., 2017). In this protocol, four main types of memories are targeted: classic traumatic memories, triggers, beliefs, and depressive and/or suicidal states. A DeprEnd EMDR protocol for depression already exists, and it entails history taking, preparation and stabilisation, memory work with pathogenic memories – processing of episode triggers, processing of negative belief systems, triggers and future work for episode triggers, processing of depressive and suicidal states as well as relapse prevention (Hase, 2022). Several studies found standard EMDR effective for depression - sometimes even more fast-acting than TF-CBT (Hofmann et al., 2016; Stanbury et al., 2020; Scelles and Bulnes, 2021). As this evidence base is still growing, EMDR is not yet recommended for depression by NICE and, hence, is not widely offered for depression in the UK. This particularly

affects more disadvantaged populations that cannot afford to access private healthcare and rely on the NHS for treatment for depression.

**Why is EMDR not currently recommended by NICE for depression symptoms?**

NICE regularly reviews recent evidence, in consultation with clinicians and stakeholders, before producing guidance for NHS-commissioned services. EMDR is a relatively new type of psychological therapy (Oren & Solomon, 2012). It also has not received as much research funding as some other forms of psychological therapies, such as TF-CBT, for instance. Therefore, there has not been sufficient time and opportunity for a large body of research to be generated for presentations other than PTSD. While a growing body of evidence studies EMDR for depression, the number of studies is still relatively small (Caille et al., 2023; Paauw et al., 2023; Onofri, 2023). Some existing studies have methodological limitations, such as a small sample size (Hu et al., 2023). This leads to the lack of a large body of evidence with robust methodologies and large sample sizes needed to change national clinical guidance. It has also been argued that EMDR is primarily a therapy for trauma such as PTSD (Shapiro, 2009), although several studies have recognised that traumatic memories play a role in depression (Monroe et al., 2009; Mandelli et al., 2015; Hovens et al., 2010; Kendler et al., 2003).

Although various interventions for depression exist, large numbers of people still suffer from depression, even after engaging with various interventions (Van Weel-Baumgarten et al., 2000). This might indicate that some mechanisms of depression are not being recognised and addressed by existing interventions. These might be traumatic memories. It is also notable that no published studies suggesting that

EMDR for depression is ineffective or contraindicated have been identified (although this could potentially be due to a publication bias).

**The rationale for this research project**

The (NICE)'s guidance for the treatment of depression does not include EMDR (NICE, 2022), recommending EMDR only for PTSD (NICE, 2018). Therefore, EMDR is not routinely offered in the NHS for depression. Given the literature summarised above, this means that people with trauma histories who are now experiencing depression are generally not able to access this treatment.

Naturally, a large-scale RCT of EMDR vs. TF-CBT for depression is beyond the scope of a professional doctorate. However, there have been no published studies to date evaluating EMDR outcomes on depressive symptoms in a primary care clinical setting. There has also been a lack of studies with large sample sizes. Investigating whether EMDR has been at least as effective in improving mood in primary care as TF-CBT could begin to close this knowledge gap. If warranted by the evidence, this could eventually lead to its inclusion in future randomised controlled trials and even perhaps future revised NICE guidelines for depression.

Several studies have demonstrated encouraging outcomes of EMDR for depression in controlled settings, under research conditions, with specific restrictive inclusion criteria (Sepehry et al., 2021; Hofmann et al., 2022; Paaw et al., 2023). However, evaluating this intervention in actual, current clinical settings with real-life individuals in practice is also important. Nearly 26% of people accessing primary care mental health NHS TT services present with depression as their primary

complaint (IAPT, 2022), so there is a need for a wide range of evidence-based treatments to meet this need.

**Research questions, objectives and hypotheses**

The primary research question of this study is whether PHQ-9 outcomes in the context of PTSD following EMDR are at least comparable to PHQ-9 outcomes following TF-CBT for depression in a UK NHS primary care mental health service. Specifically, do the pre- and post-depression scores differ according to therapy after controlling for baseline PTSD levels? The secondary research question is whether the EMDR intervention requires less overall treatment time than TF-CBT.

The aim of this study is to evaluate PHQ-9 scores in the context of PTSD following EMDR versus TF-CBT within such a service through the production of a large, practice-based dataset, documenting many thousands of hours of clinical effort. The objective is, therefore, to perform a retrospective secondary data analysis with a large sample size, evaluating the PHQ-9 scores in the context of PTSD following EMDR compared to an active control group of treatment as usual (TAU) TF-CBT.

This project would be relevant to counselling psychology because depression and trauma are prevalent presenting difficulties within counselling psychology practice, both within the NHS and in general. Counselling psychologists also believe that all people should be able to access a range of therapies, regardless of the person's class or socio-economic background. In the UK, that means through the NHS. Contributing robust quantitative studies to the literature helps to facilitate this. This

is, therefore, a suitable project for a counselling psychology doctorate from a pragmatic social justice perspective.

Hypothesis 1: Pre- and post- PHQ-9 scores differ significantly according to therapy type (EMDR/TF-CBT) after controlling for baseline PTSD levels.

H2: The EMDR intervention required significantly fewer sessions than the TF-CBT intervention.

H3: The EMDR intervention required significantly fewer overall therapy minutes than the TF-CBT intervention.

# Methodology

## Design

The design of this study was a quantitative quasi-experimental retrospective outcome evaluation with two independent groups - the intervention group (EMDR) and the active control group (TAU TF-CBT). No randomisation is involved, as the type of intervention would have been selected collaboratively by the assessing clinician and the client depending on the client's needs and choice. Pre- and post-measures for each group were collected prior to the intervention and post-intervention, considering baseline depression levels. The number of sessions attended was also recorded for each participant. Time (pre-treatment, post-EMDR/TF-CBT) was a within-subject variable and intervention (TF-CBT or EMDR) was a between-subject variable. The EMDR intervention and TF-CBT control group were two levels of one between-subject independent variable (IV) – the treatment group. Post-intervention depressive symptoms level was the primary within-subject dependent outcome variable (DV), which was operationalised using the Patient Health Questionnaire (PHQ-9). Pre-intervention post-traumatic stress symptoms level was the covariate, operationalised using the PTSD Checklist (PCL-5; please refer to the Materials section for more details). As interventions in this study were aimed at PTSD rather than directly at depression, covariate helped to control for baseline PTSD levels to be able to measure the effects of interventions on depressive levels whilst controlling for PTSD levels, as PTSD levels could be a confounding factor, severity of which could affect intervention for depression outcomes.

**Setting**

The study involves a secondary retrospective data analysis of clients who accessed an English NHS primary care psychological therapies service, Talking Therapies Portsmouth. Individuals living in the Portsmouth area can self-refer or be referred by a professional to access this service. Inclusion criteria for this service are mild to severe depression, anxiety disorders or PTSD. Significant risks to the safety of the client or others, as well as significant substance misuse or severe and enduring mental health difficulties, such as active personality disorders or psychosis, are exclusion criteria in this service. The service offers flexibility regarding the number of sessions, based on idiosyncratic needs of each client on a case-by-case basis, in line with the NICE-recommended treatment doses for all modalities, including EMDR and TF-CBT.

**Participants**

Both TF-CBT and EMDR are treatments that are routinely offered in this service for PTSD. As NHS services are guided by the NICE recommendations, this service offers EMDR for PTSD only and TF-CBT for PTSD, depression and other difficulties. Therefore, participants of this study would have received EMDR or TF-CBT treatment for PTSD (see the section Treatment Methods section for more details).

An a priori statistical power calculation using G*Power (Faul et al., 2007; 2009) for a specified $\alpha = 0.05$, f=0.15, showed that a sample size of around 580 participants was required to reach a power (1–β) equal to 95% (please see Appendix 8). *F* referred to the expected effect size of .15 (small to moderate) to be more

conservative to ensure the study is powerful enough to identify even a small to moderate effect size. A total number of 2,383 client records were included in the study at the start. The total number of client records included in the analyses was 581 (please refer to the Data Compilation and Cleaning section for details).

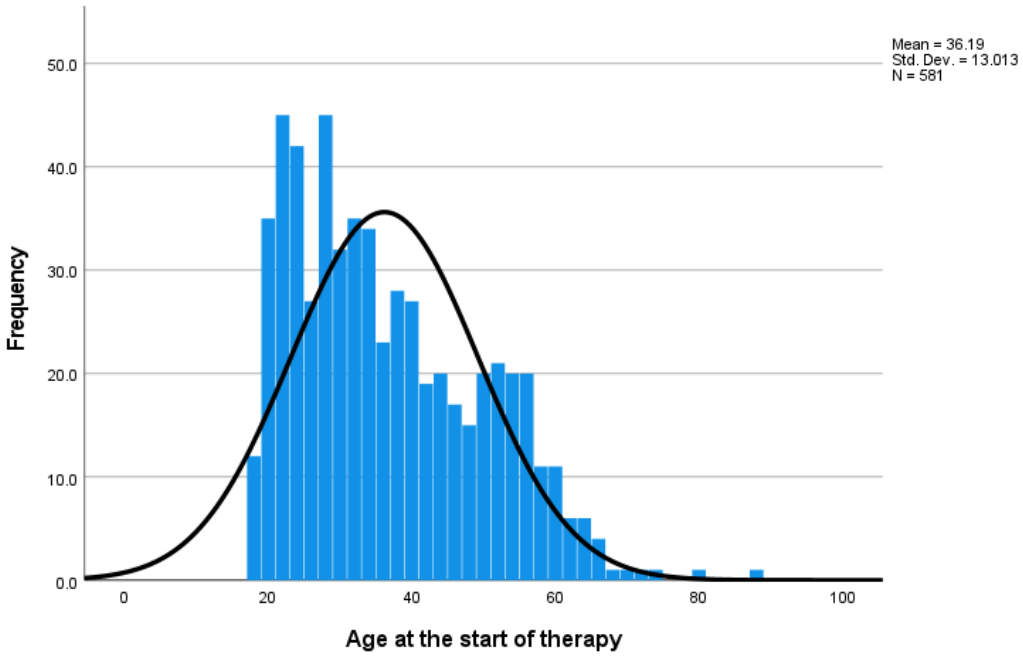
**Participants' demographics**

Among 2,383 cases who completed EMDR or TF-CBT therapy between 2020 and 2024, a total of 581 were included in this study and upon data cleaning and outliers' exclusion, 577 case records were included in the ANCOVA data analysis. Please refer to the Data Compilation section for details on how the sample was generated.

The mean age of participants was 36, and ages ranged from 18 to 87. Figure 1 visually represents the age of the participants.

Figure 1.

*The ages of the participants*



The majority of participants were female (N=425), while N=148 were male, and N=8 identified as “other.” The most predominant ethnicity of participants was White British (N=470). Table 1 summarises the gender and ethnicity of the participants.

*Table 1.*

*Gender and ethnicity characteristics of the participants.*

| *Gender* | *n* | *%* |
|---|---|---|
| Female | 425 | 73.1 |
| Male | 148 | 25.5 |
| Other | 8 | 1.4 |
| Total | 581 | 100 |
| *Ethnicity* | *n* | *%* |
| Arab | 12 | 2.1 |
| Asian | 8 | 1.4 |
| Bangladeshi | | |
| Asian Indian | 7 | 1.2 |
| Asian Other | 11 | 1.9 |
| Black African | 6 | 1 |
| Black Caribbean | 2 | .3 |
| Black Other | 4 | .7 |
| Mixed | 14 | 2.4 |
| Other | 2 | .3 |
| White British | 470 | 80.9 |

| | | |
|---|---|---|
| White Irish | 2 | .3 |
| White Other | 43 | 7.4 |
| Total | 581 | 100.0 |

**Information governance and consent**

The PGR is the clinical lead for this NHS Talking Therapy Portsmouth service and has been granted approval to access this data for service evaluation purposes. All data was analysed via SPSS within the Trust's secure ICT environment.

The following individuals have been consulted and granted their approval for this project, confirming that the data handling arrangements are acceptable. (Written confirmation was provided with the RD1 and ethics submissions. It can also be provided to the progression reviewers if requested):

- The Data Protection Officer, Head of Information Governance and Digital Security at the Information Governance Team, who also manages the Caldicott Guardian queries in the Solent NHS Trust;
- Head of Improvement at the NHS Trust Academy of Research and Improvement, Solent NHS Trust

As this is an evaluation of existing data, this project has been classed as a service evaluation and, therefore, does not require additional NHS ethical approval.

**Ethics**

The University of the West of England, Faculty Research Ethics Committee has granted ethical approval for this project (HAS.23.06.138, please see Appendix 2). In line with the Data Protection Act (1998), electronic data was anonymised, coded and

stored on a password-protected encrypted NHS laptop, remaining on the secure virtual network. The NHS Trust and the UWE have also signed the collaboration contract for this study (PIMS Contract ID: 11094009, please see Appendix 3).

## Materials

### *Patient Health Questionnaire (PHQ-9)*

The Patient Health Questionnaire (PHQ-9, Kroenke et al., 2001) is a self-administered questionnaire which forms part of the diagnostic instrument for common mental disorders PRIME-MD. The PHQ-9 is the depression module; it scores each of the nine DSM-5 criteria for Major Depressive Disorder (MDD) on a Likert scale from 0-*Not at all* to 3-*Nearly every day*, with total scores ranging between 0-27 and a clinical cut-off score ≥10, which suggests the criteria for depression have been met (Manea et al., 2012). Scores of 5–9 are classified as mild depression symptoms levels; 10–14 as moderate depression symptoms levels; 15–19 as moderately severe depression symptoms levels; ≥ 20 as severe depression symptoms levels (Spitzer et al., 2014). Questions include "Over the last two weeks, how often have you been bothered by any of the following problems? — Little interest or pleasure in doing things" (Kroenke et al., 2001). The PHQ-9 has good construct and criterion validity. According to Kroenke et al. (2001), Cronbach's α on the PHQ-9 scale was 0.89, indicating excellent internal consistency. PHQ-9 ≤ 9 suggests "recovery", and a reduction of 6 or more points suggests reliable improvement (Gyani et al., 2013).

### *PTSD Checklist for DSM-5 (PCL-5)*

The PTSD Checklist (PCL-5, Blevins et al., 2015) is a valid and reliable self-report questionnaire for the assessment of PTSD (Ashbaugh et al., 2016). It was updated in line with the DSM-5 criteria for PTSD (APA, 2013) and has twenty items. It uses a Likert scale from 0-*Not at all* to 4-*Extremely*, with a total score range between 0-80. Questions include "In the past month, how much were you bothered by:" — 1. Repeated, disturbing, and unwanted memories of the stressful experience?" (Blevins et al., 2015). The cut-off score of ≥30-33 achieves the optimal balance of sensitivity and specificity (area under the curve = .82, $p < .001$; sensitivity = .82, specificity = .70). The re-test interval and validation assessments indicate that this is a reliable and valid assessment and screening instrument (Forkus et al., 2023). Cronbach's α on the PCL-5 scale was 0.94, indicating excellent internal consistency (Blevins et al., 2015). The cut-off score of 32 and above suggests that the criteria for PTSD have been met (Blevins et al., 2015). PCL-5 ≤ 31 suggests "recovery", and a reduction of 18 or more points is indicative of reliable improvement. PCL-5 ≤ 28 suggests an individual is more likely to belong to the non-PTSD population than the PTSD population (Marx et al., 2022).

**Treatment methods**

Both the EMDR and TAU TF-CBT arms comprised individuals presenting with PTSD and depressive symptoms. They completed a standard assessment to ensure they met the service inclusion and exclusion criteria mentioned earlier. Individuals would have then been placed on the waiting list for either EMDR or TF-CBT, depending on their preferences. After approximately six weeks, they would have commenced high-intensity psychological therapy, comprising approximately 12 weekly 50-

minute-long sessions. The total number of sessions would have been guided by their clinical need and engagement. At every session, a routine PHQ-9 and PCL-5 self-report measure was collected.

The standard EMDR protocol (Shapiro, 2008) was used in the EMDR condition consisting of the following phases:

- Phase 1: History Taking.

  This phase entails the exploration of what brings the client to therapy and the development of a safe therapeutic relationship. The client's *history of traumatic events is discussed,* and a *therapy plan is developed.*

- Phase 2: Preparation.

  In this phase, the EMDR therapy process, terms, and expectations are discussed. The client's concerns or questions are explored, and specific techniques to cope with emotional disturbances are developed.

- Phase 3: Assessment.

  In the assessment phase, the target memory to reprocess, associated images, cognitions, emotions and sensations (TICES) are identified. Subjective Units of Distress (SUD) and the Validity of Cognition (VOC) are rated on a scale 0-10 and 1-7, respectively.

- Phase 4: Desensitisation.

  This phase entails 'reprocessing' involving dual attention bilateral stimulation (BLS), which is aimed at activating the client's information processing system while keeping the client in the present moment. BLS most

frequently entails side-to-side eye movements but could also consist of sounds or taps.

- Phase 5: Installation.

The installation phase begins once the SUDs are reduced to 0 and desensitisation is complete. Here, the client associates and strengthens their positive belief with the target memory until it feels completely true.

- Phase 6: Body Scan.

During this phase, the client holds in mind the target memory and the positive cognition while mentally scanning the bodily sensations. Lingering bodily disturbance is reprocessed with BLS.

- Phase 7: Closure.

The reprocessing session ends with the closure phase. Here, the client is supported to a state of calm in the present moment, whether the reprocessing is complete or not.

- Phase 8: Re-evaluation.

  Each new session after reprocessing begins with re-evaluation. The client and therapist discuss recently processed memories to ascertain whether the same memory needs re-processing again or another target memory needs to be selected.

The standard TF-CBT protocol (Ehlers & Clark, 2000) would have been used in the TAU TF-CBT condition, consisting of the following stages:

- Assessment;
- Rationale for treatment;

- Thought suppression experiment;
- Psychoeducation;
- Reclaiming one's life;
- Reliving with cognitive restructuring;
- In vivo exposure;
- Identifying triggers of intrusive memories and emotions;
- Imagery techniques.

**The procedure of data collection**

Data is routinely collected for each client at every session using the PHQ-9 questionnaire (Kroenke et al., 2001) for depression, along with other self-report inventories. For clients presenting with PTSD, data is also collected via the PCL-5 (Blevins et al., 2015) self-report measure at every session. Each session is routinely recorded on the electronic database IAPTus, and demographic data, such as age, ethnicity and gender, is, again, routinely collected at the point of each referral.

This study entailed extracting a report from the IAPTus electronic database, including all cases that completed high-intensity psychological therapy treatment in two years between January 2020 and December 2023, inclusively. This period would be the most recent, considering it can take a few months for data to be updated following data quality audits. It was also estimated that during this period, the required total of 580 cases would have completed EMDR and TF-CBT treatments. The process to download the required report from the IAPTUs electronic database system is selecting the following options on the IAPTus dashboard tab:

Dashboard Report

IAPT MDM v2 Core

Discharge Reason Tab

Using the dates required and the following headings from a full download

Column Headings

EndDescShort

EndDesc

LocalPatientID

Referral Progress

StepIntensityFirst

StepIntensityLast

TherapyType_FirstDescShort

TherapyType_LastDescShort

CurrentStageDateTime

CurrentStageListDesc

Month (this column is created in Excel using the EOMonth function)

This produced a pivot table showing the number of clients who completed a course of treatment by month broken down into Step Intensity Last and Therapy type last.

Subsequently, only cases that had a treatment modality, high-intensity TF-CBT and EMDR, were selected and downloaded as an Excel spreadsheet. The researcher then went into each case record on the IAPTus database and extracted the following data for each case: treatment modality completed (TF-CBT or EMDR), pre- and post- PHQ-9 and PCL-5 scores, the treatment dose (i.e., the number of sessions

received and the duration of each session, to measure the number of minutes of TF-CBT or EMDR received, gauging overall treatment time), age, gender and ethnicity. While this was very time-consuming, it enabled a retrospective evaluation of the effect of EMDR or TF-CBT on depressive symptoms in current clinical practice. The Excel spreadsheet that was used to record the required anonymised data was stored on the NHS Trust encrypted and password-protected laptop.

Data has been crosschecked to ensure no discrepancies between double datasets. Data was then coded using numerical values. As per Pallant (2020), the dataset in the Excel spreadsheet was checked for errors and scores that were out of the range of possible values for that variable. For instance, gender was coded 1=female, 2=male, and 3=other. Therefore, no other values but 1, 2 and 3 should have been found in that column. The range of PHQ-9 scores is 0-27; hence, 28 or above should not have been found for that column. Subsequently, where applicable, the source of error was located and corrected. Furthermore, the dataset was checked for errors in SPSS, as per Pallant's (2020) procedure. The number of valid or missing cases was checked, and the root cause was identified, where possible.

Both the EMDR and TAU TF-CBT arms comprised individuals over 18 years of age presenting with PTSD and depressive symptoms. No participants presented with PTSD without depressive symptoms, as per the service assessment criteria. Individuals then were placed on the waiting list for *either* EMDR or TF-CBT, depending on their preferences and needs; they were *not* randomised. After approximately six weeks of waiting time, they commenced *either* high-intensity TF-CBT or EMDR therapy (*not* both), comprising approximately 12 weekly 50-minute-

long sessions. The total number of sessions was guided by their clinical need and engagement, but the minimum number of sessions was 2. At every session, routine PHQ-9 and PCL-5 self-report measures were collected. It is important to note that in this service, there is no limit to how many times a client can self-refer to the service and have up to three courses of various therapies. This could potentially mean that prior to TF-CBT or EMDR interventions in this study, clients could have had up to sixty prior sessions several times in past referral episodes. This could involve either a course of CBT, EMDR, Acceptance and Commitment Therapy (ACT), Compassion-Focussed Therapy (CFT), Narrative Exposure Therapy (NET), Dynamic Interpersonal Therapy (DIT), Interpersonal Therapy (IPT), Couples Therapy, counselling or guided self-help.

No personal identifiable data was collected. All data was anonymised at the point of extraction. SPSS data files will be destroyed once the final thesis amendments and journal article publication are completed and approved. However, the data will remain in the NHS electronic IAPTus system, which is in line with the NHS Information Governance policies and Data Protection Law.

**Data compilation and cleaning**

A total of 2,383 client records were included in the initial IAPTus report of clients who completed high-intensity TF-CBT and EMDR over the last four years (2020-2023). Table 2 summarises the total number of cases included in the IAPTus and exclusion steps; Figure 2 visually represents the participants' flow. Clients who completed EMDR all had PTSD as their presenting difficulty. Clients who completed TF-CBT have had various presenting difficulties, such as depression, generalised anxiety, social

anxiety, obsessive-compulsive disorder, illness anxiety, specific phobias, or complicated trauma - not only PTSD. A total of 1,775 cases that were experiencing a presenting difficulty other than PTSD were excluded from the TF-CBT list to include only clients whose main presenting difficulty is PTSD, both for EMDR and TF-CBT, as a fair comparison. Twenty-five cases with missing PCL-5 scores were also excluded from TF-CBT and EMDR groups. Forty clients were excluded from the TF-CBT group due to being on an incorrect pathway, as they had undergone EMDR therapy. Hence, they were transferred to the EMDR group list. One case record was excluded due to moving out of the area and being transferred to another local service. In addition, one case was excluded from the EMDR list due to attending only one session, after which they were referred to a secondary care service. In total, over the four years (2020-2023 inclusive), 208 clients completed EMDR for PTSD and 374 for those who received TF-CBT for PTSD, totalling 581 against the 580 participants required by the statistical power calculation.

Notably, while all clients in this study received TF-CBT or EMDR to address their PTSD, the focus of this project is the impact of TF-CBT versus EMDR on depressive symptoms only. Outliers, which are data points that significantly deviate from others (Aguinis et al., 2013), have been removed to prevent them from skewing the results, as these extreme values can also impact statistical power, making it challenging to identify a true effect if there is one (André, 2022). Although outlier handling has been a subject of controversy and debate, Bakker and Wicherts, 2014) suggested that the preferred practice is to explicate the handling of outliers in advance. The outliers filter in this study was set prior to any statistical analyses. Three standard deviations below or above the mean was the criterion for deciding whether a point was an

outlier or not. For each hypothesis, data points more than three standard deviations above or below the mean for the relevant continuous variables were considered outliers and, thus, excluded from the respective ANCOVA and t-test analyses. Upon inspection of distribution graphs, outliers seem to inflate the effect size, skewing the central tendency of the data set in favour of EMDR, so it was important to remove them to reduce the probability of a Type II error.

Underlying assumptions for the statistical analyses, such as normal distribution, homogeneity, and out-of-range data, have been checked. It was important to check underlying assumptions of statistical tests, such as that this data was normally distributed, before performing statistical tests because this ensures the validity of these test results since t-tests and ANOVAs assume the normal distribution of the data. Respective ANOVA and t-test assumptions were checked.

*Table 2.*

*The total number of cases included in the IAPTus report and excluded from the study, with reasons outlined.*

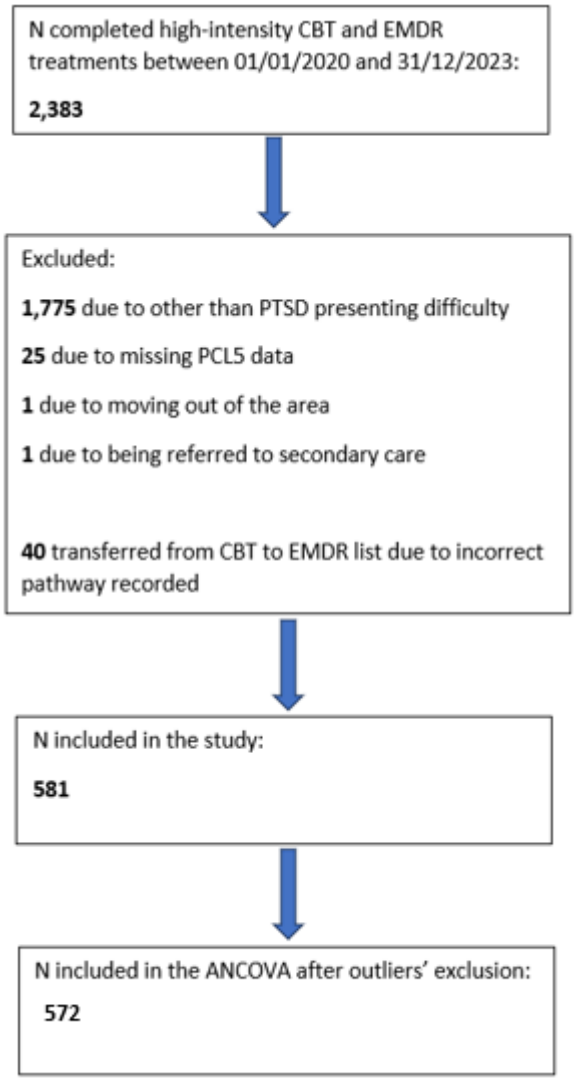
| Year | TF-CBT | EMDR |
|---|---|---|
| 2023 | 574 in the report<br><br>469 were excluded due to having other than PTSD, presenting difficulty | 56 in the report<br><br>1 excluded due to having only one session and being referred to secondary care |

| | | |
|---|---|---|
| | 1 excluded due to missing PCL-5 data | 1 excluded due to missing PCL-5 data |
| | 13 were excluded due to incorrect pathway – they were undergoing EMDR | 13 included as they were on the TF-CBT pathway in error |
| Total 2023 158 | 91 | 67 |
| 2022 | 716 in the report | 39 in the report |
| | 556 excluded due to having other than PTSD presenting difficulty | |
| | 10 excluded due to missing PCL-5 data | |
| | 7 excluded due to incorrect pathway – they were undergoing EMDR | 7 included as they were on the TF-CBT pathway in error |
| | 1 moved out of the area | |
| Total 2022 188 | 142 | 46 |
| 2021 | 577 in the report | 44 in the report |

| | | |
|---|---|---|
| | 474 were excluded due to having other than PTSD, presenting difficulty | |
| | 1 excluded due to missing PCL-5 data | 3 excluded due to missing PCL-5 data |
| | 12 excluded due to incorrect pathway – they were undergoing EMDR | 12 included as they were on the TF-CBT pathway in error |
| Total 2021 143 | 90 | 53 |
| 2020 | 341 in the report | 36 in the report |
| | 276 were excluded due to having other than PTSD, presenting difficulty | |
| | 6 excluded due to missing PCL-5 data | 3 excluded due to missing PCL-5 data |
| | 8 excluded due to incorrect pathway – they were undergoing EMDR | 8 included as they were on the TF-CBT pathway in error |
| Total 2020 92 | 51 | 41 |
| **Grand total 581** | **374** | **207** |

*Figure 2.*

*Participants' flow diagram*



**Statistical analyses**

Data was processed and analysed using the Statistical Package for Social Sciences (SPSS) version 28.0.1.1. The significance level was set at $p < .050$. Mean and standard deviations (SD) were calculated for all continuous variables. Count and percentage were calculated for all categorical variables.

As this is a non-randomised study, it was important to confirm that participants did not differ by group at the point of treatment. Therefore, independent sample t-tests were run to compare the dependent variables (pre-PHQ-9) and the covariate (pre-PCL-5) in TF-CBT versus EMDR independent groups to confirm that the group was indeed a random factor and there was no significant statistical difference between the two groups. These t-tests were found to be statistically non-significant. Therefore, as pre- scores did not significantly differ between groups, this assumption has been met. The homogeneity of regression slopes has also been tested. The homogeneity of regression slopes is an assumption of ANCOVA according to which the weights relating the covariate to the dependent variable are equal across all levels of the factor. Intervention type x pre-PCL-5 was also non-significant; hence, the assumption of the homogeneity of regression slopes was also met.

To test the first research question, i.e., whether EMDR and TF-CBT differ in their effectiveness regarding the reduction of depressive outcomes, a 2 (time: pre- vs post-intervention; within-subjects) x 2 (intervention type: EMDR vs TF-CBT, between-subjects) mixed Analysis of Covariance (ANCOVA) with pre-intervention PTSD symptom levels (PCL-5 scores) as a covariate was performed. The aim was to

test whether the means were still statistically equal or different after adjusting for the effect of the covariate – the PTSD score.

To test the second research question, the t-tests were used to compare the total number of treatment sessions and the total treatment time in minutes between the EMDR and TF-CBT groups. The PGR student undertook the data analysis with the support of the second supervisor, who was an expert in statistics, inferential data analysis, and quantitative methods.

Analyses (between various measurement times) were performed using Pearson's correlation and ANCOVA to measure effect sizes.

## Results

### Descriptive statistics, assumption testing and t-tests for differences in potential confounds

Table 3 illustrates the descriptive comparison of both groups. T-tests showed a significant difference between pre-therapy PHQ-9 scores in the context of PTSD for TF-CBT and EMDR, $t(579) = -5.72$, $p < .001$. Pre-therapy PHQ-9 scores for the EMDR group ($M=19.12$) were significantly higher than those for the TF-CBT group ($M=16.69$).

There was no significant difference between pre-therapy PTSD scores (as measured by the PCL-5), $t(578) = -1.11$, $p = .134$. Pre-therapy PCL-5 scores for the EMDR group were not significantly higher than those for the TF-CBT group. Both groups had their pre-scores on PHQ-9 falling into a clinical range of moderately severe levels of depressive symptoms.

*Table 3.*

*Levels of PHQ-9 scores in the context of PTSD and levels of PCL-5 scores pre- and post-intervention by group.*

| | CBT | | EMDR | |
|---|---|---|---|---|
| | ***M*** | ***SD*** | ***M*** | ***SD*** |
| ***PHQ-9 pre-*** | 16.69 | 5.12 | 19.12 | 4.51 |
| ***PHQ-9 post-*** | 7.75 | 5.28 | 6.26 | 3.95 |
| **PCL-5 pre-** | 51.43 | 13.92 | 52.71 | 12.23 |
| **PCL-5 post-** | 25.2 | 15.32 | 20.53 | 13.13 |

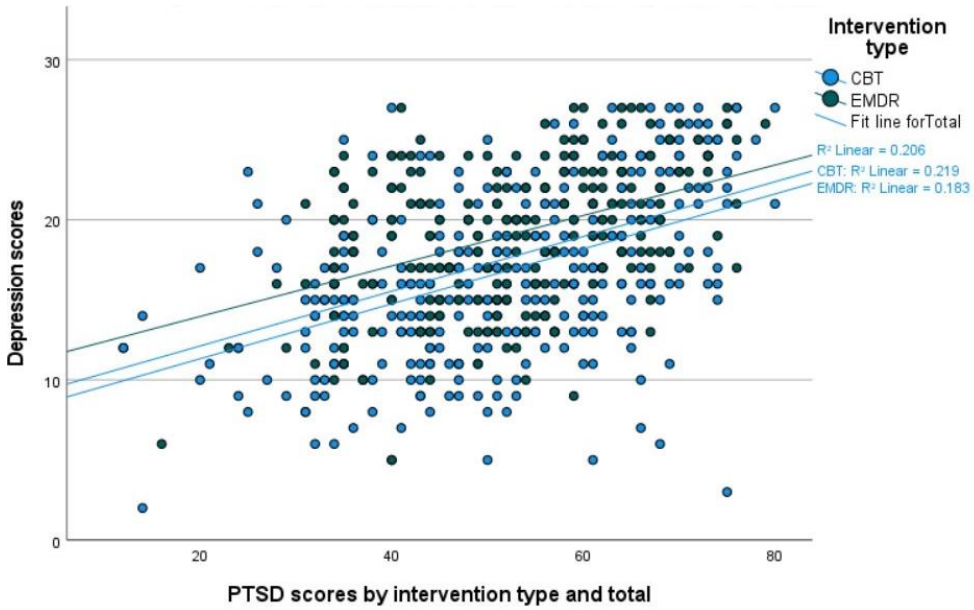
*Note. CBT group n=374, EMDR group n=207*

Parametric tests assume certain characteristics about the data, known as assumptions. Violating these assumptions changes the research conclusion and interpretation of the results (Field, 2024). Therefore, all assumptions for parametric tests employed in this study were checked. The homogeneity of regression slopes was tested, and a significant interaction between the covariate (pre-PCL-5 scores) and the independent variable (treatment group – TF-CBT or EMDR) was found ($t(581) = -5.72$, $p < .001$). Pre-therapy PHQ-9 scores for the EMDR group (M=19.12) were significantly higher than those for the TF-CBT group (M=16.69). Figure 3 depicts this interaction on the scatterplot (please see Appendix 10 for more details in the SPSS output). However, ANCOVA is a robust test. This study has a large sample size, and the distribution of the number of participants in these groups is relatively balanced. In ANCOVA, the baseline imbalance is accounted for, and the

baseline also accounts for some of the variation post-intervention, giving more statistical power. For the effect of intervention type, homogeneity of variance was also tested via Levene's test.

*Figure 3.*

*Scatterplot depicting significant interaction between the pre-PTSD scores and the PHQ-9 scores.*




**Primary Research Question: Are PHQ-9 outcomes in the context of PTSD following EMDR and TF-CBT comparable?**

This study investigated whether the different psychotherapy treatments (EMDR or TF-CBT) had a different or comparable impact on the PHQ-9 scores in the context of PTSD trends over time.

A 2x2 mixed ANOVA with a baseline covariate PCL-5 was performed comparing interactions between time and intervention groups.

There was a significant main effect of time, $F(1, 574) = 77.79$, $p < .001$, partial eta squared = .119, suggesting a large effect size. Mean PHQ-9 scores prior to treatment (M = 17.85, 95% CI[17.47, 18.22]) were significantly higher than mean PHQ-9 scores after treatment (M = 7, 95% CI[6.6, 7.4]).

There was a significant main effect of treatment type (TF-CBT or EMDR), $F(1, 574) = .79$, $p = .38$, partial eta squared = 0.001. Mean PHQ-9 scores after the TF-CBT treatment (M = 7.81, 95% CI[7,34, 8.28]) were significantly different from mean PHQ-9 scores after the EMDR treatment (M = 6.19, 95% CI[5.55, 6.83]).

The main effect of time was qualified by an interaction with treatment type, $F(1, 574) = 67.18$, $p < .001$, partial eta squared = .105, indicating a large effect size. As can be seen from Table 4 and Figure 4.

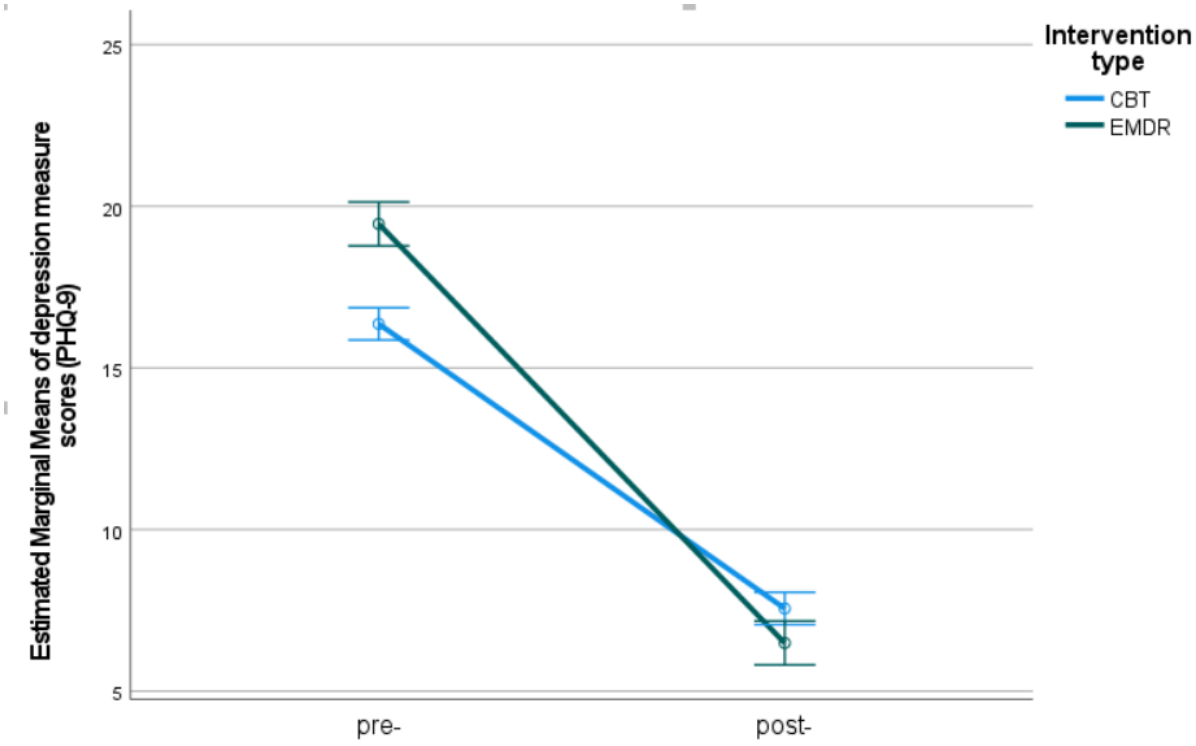
There was a significant effect of covariate pre-PCL-5 on time (pre- and post- PHQ-9), $F(1, 574) = 11.54$, $p < .001$, partial eta squared = .02, indicating a small effect size. This means that baseline PTSD levels had a significant but small effect on PHQ-9 scores after both interventions.

Both TF-CBT and EMDR groups met the criteria of recovery and reliable improvement whilst no longer meeting the clinical criteria for depression and PTSD on either post-test measures (Manea et al., 2012; Blevins et al., 2015). However, the EMDR group appeared to have better outcomes compared to TF-CBT - a

reduction of 12.86 points on PHQ-9 and 32.18 points on PCL-5 in the EMDR group, compared to a decrease of 8.94 on PHQ-9 and 26.23 in the TF-CBT group.

*Figure 4.*

*The mean PHQ-9 scores in the context of PTSD pre- and post-EMDR and TF-CBT interventions after controlling for pre-therapy PTSD scores (PCL-5).*




*Note. This model used PTSD pre-scores as a covariate.*

*Table 4.*

*Estimated marginal means of PHQ-9 scores in the context of PTSD for TF-CBT and EMDR groups pre-test and post-test after controlling for pre-PCL-5 covariate.*

| | TF-CBT | | EMDR | |
|---|---|---|---|---|
| | *M* | *95% CI* | *M* | *95% CI* |
| ***PHQ-9 pre-*** | 16.76 | [16.31, 17.2] | 18.94 | [18.34, 19.54] |
| ***PHQ-9 post-*** | 7.81 | [7.34, 8.28] | 6.19 | [5.55, 6.83] |

For the covariate, the PCL-5 scores, the Levene's test suggested that the assumption of homogeneity of variances was met. Assuming non-equal variances, no significant difference in PCL-5 baseline scores between CBT and EMDR groups was found.

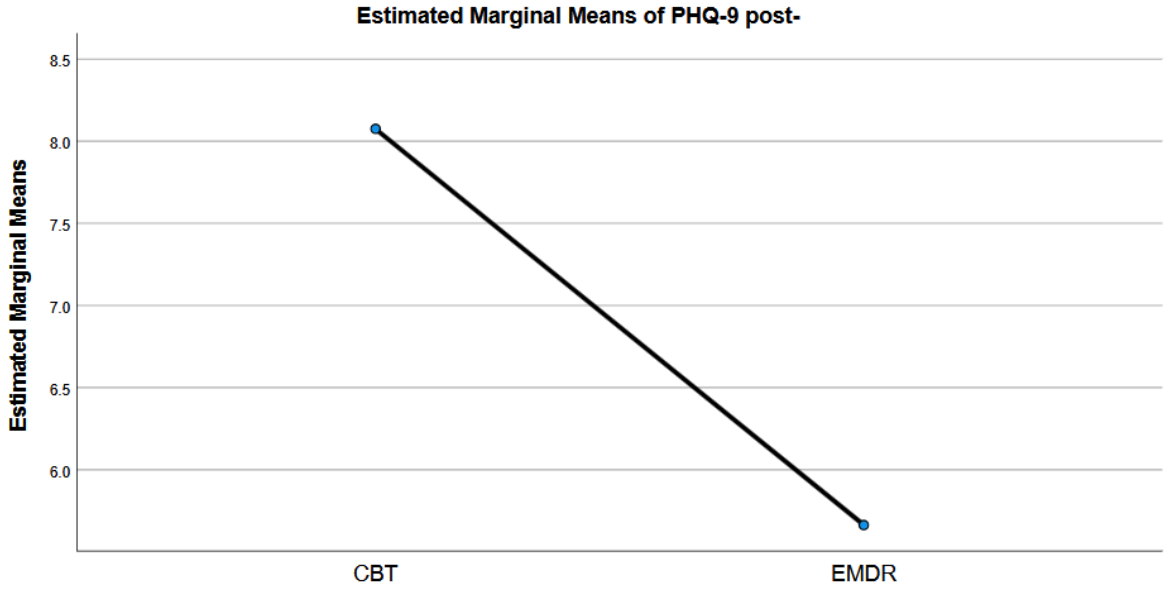
To summarise, the PHQ-9 baseline scores were significantly different for EMDR and CBT groups, whilst PCL-5 scores were not. The t-test indicated a significant PHQ-9 difference between groups pre-intervention. Therefore, an ANCOVA on post-PHQ9 was run to test whether controlling for pre-PHQ-9 scores as a covariate would lead to significantly different post-PHQ-9 scores between groups. A one-way ANOVA (intervention group: EMDR vs CBT) with pre-PHQ-9 scores as a covariate was performed to test for an interaction between time and intervention groups whilst controlling for baseline PHQ-9 scores.

There was a significant main effect of treatment type, F(1, 575) = 36.62, p <.001, partial eta squared = 0.06. Mean PHQ-9 scores after the EMDR treatment (M = 6.26) were significantly lower than after the TF-CBT treatment (M = 7.75). That is, controlling for baseline PHQ-9, PHQ-9 post-intervention was significantly lower for participants receiving EMDR than CBT intervention (M diff = 1.49 on 27-point scale).

These two main effects were qualified by an interaction of treatment type and covariate pre-PHQ-9, F(1, 574) = 2.56, p = 0.11. As can be seen from Figure 5, post-intervention, mean PHQ-9 was significantly lower in EMDR than the CBT group after controlling for initial baseline PHQ-9. That is, while at the outset the mean PHQ-9 was significantly higher in groups about to receive EMDR than in those about to receive CBT, post-intervention PHQ-9 scores were lower in the EMDR compared to CBT group.

*Figure 5.*

*The mean PHQ-9 scores in the context of PTSD pre- and post-EMDR and TF-CBT interventions after controlling for pre-therapy PHQ-9 scores.*



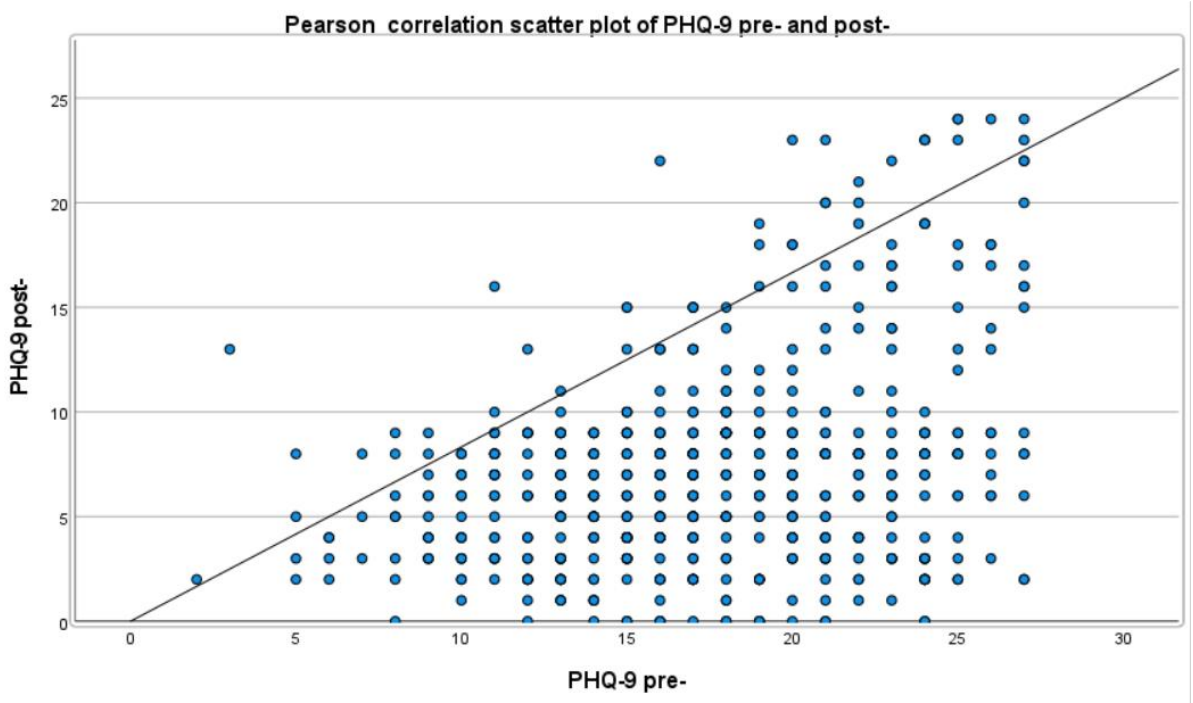
*Note. This model used PHQ-9 pre-scores as a covariate.*

**Pearson correlation**

A Pearson correlation coefficient was computed to assess the linear relationship between pre- and post-intervention levels of PHQ-9 scores in the context of PTSD. There was a weak positive correlation between the two variables, $r(577) = .347$, $p = .001$, which also suggests the effectiveness of the intervention, as illustrated by Figure 6.

*Figure 6.*

*A scatter plot illustrating the weak positive correlation between pre- and post-PHQ-9 scores*




*Note. This model used PTSD pre-scores as a covariate*

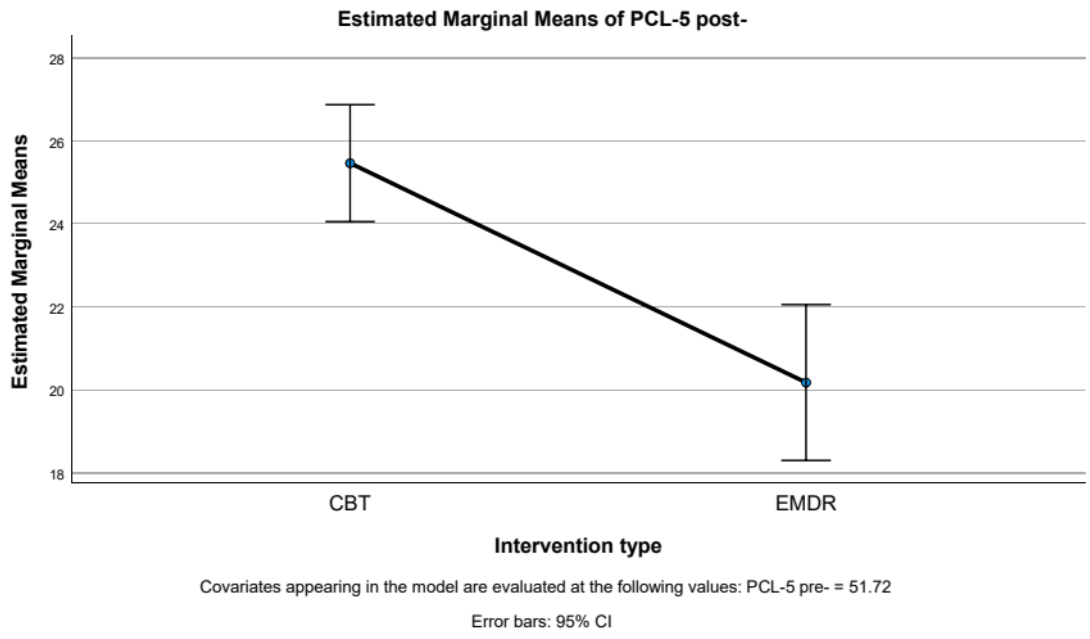
**ANCOVA comparing pre- post-PCL-5 outcomes following TF-CBT vs EMDR**

In order to test whether there were statistically significant differences between intervention groups (independent variable) on PTSD (dependent variable) pre- and post-treatment, a two-way ANCOVA was performed. There was a statistically significant effect of treatment type (TF-CBT or EMDR), $F(1, 574) = 20$, $p < .001$, partial eta squared = .033, indicating a small effect size. Mean PTSD scores after the EMDR treatment (M = 20.53, SD = 13.13, 95% CI) were significantly lower than mean PTSD scores after the TF-CBT treatment (M = 25.26, SD = 15.3, 95% CI).

As can be seen from Figure 7, the effect of intervention was stronger for the EMDR group compared to the TF-CBT group. This indicates that EMDR might be more effective for PTSD (as measured by PCL-5) than TF-CBT for PTSD.

*Figure 7.*

*The mean PTSD scores (PCL-5) post-EMDR and TF-CBT interventions after controlling for baseline pre-therapy PTSD scores (PCL-5).*




**Secondary research question: Does an EMDR intervention require less overall treatment time compared to TF-CBT?**

T-tests have been computed to answer the secondary research question. The observed outcome means and effect sizes for both treatment groups before and after the intervention are presented in Table 5. Medium effect sizes were found for both total number of therapy sessions (d=.627) and therapy minutes (d=.651).

*Table 5.*

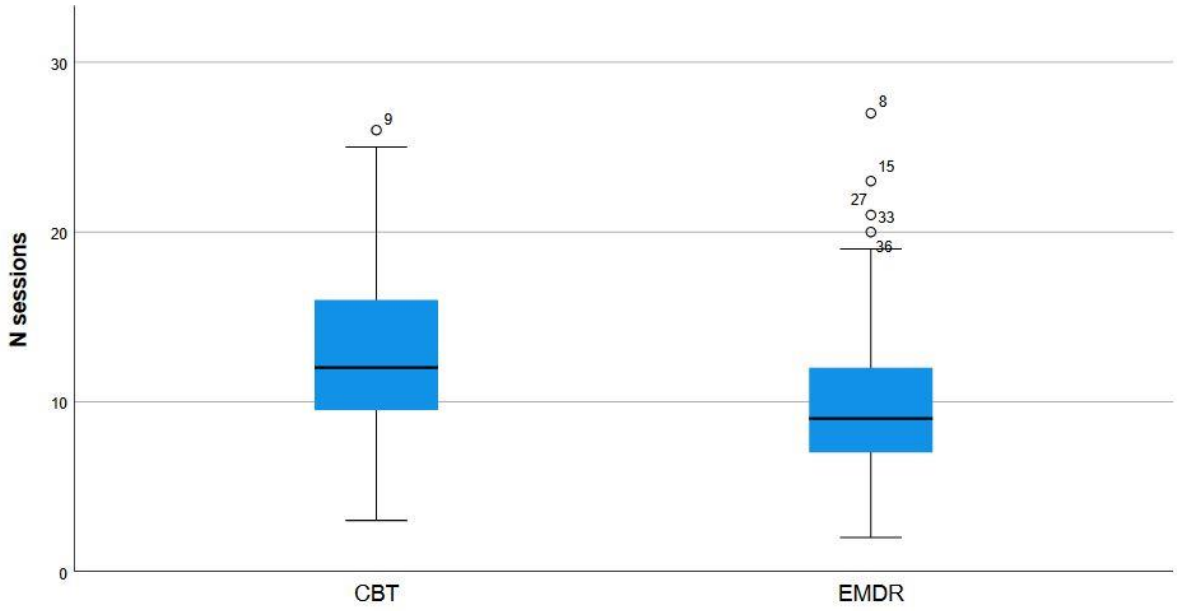
*Therapy dose of TF-CBT compared to EMDR*

| | TF-CBT | | EMDR | | *t*(456.138) | *p* | Cohen's *d* |
|---|---|---|---|---|---|---|---|
| | ***M*** | ***SD*** | ***M*** | ***SD*** | | | |
| **N of therapy sessions** | 12.64 | 4.47 | 9.91 | 4.13 | 7.37 | <.001 | .627 |
| **N of therapy minutes** | 758.44 | 269.02 | 590.53 | 237.1 | 7.74 | <.001 | .651 |

The number of sessions of EMDR was statistically significantly fewer than the number of sessions of TF-CBT for depression, t(571) = 7.47, p = < .001. Figure 8 visually represents the total number of therapy sessions per group.

*Figure 8.*

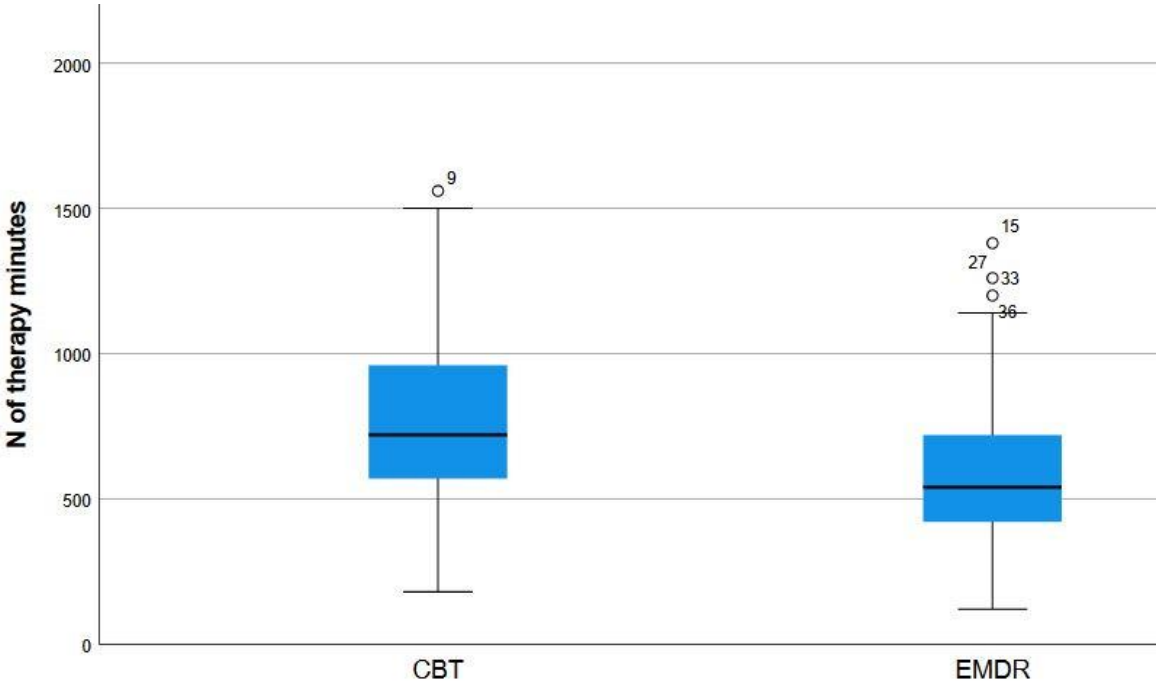
*The boxplot illustrating the mean number of therapy sessions for both groups.*



Given that some trauma processing sessions might require 90 minutes rather than the standard therapy hour, total treatment time in minutes has also been examined. The total number of minutes of therapy for EMDR was statistically significantly fewer than the total number of minutes for TF-CBT, t(571) = 7.48, p = < .001). Figure 9 illustrates the total number of therapy minutes per group.

*Figure 9.*

*The boxplot illustrating the mean number of therapy minutes for both groups.*




These results suggest that EMDR and TF-CBT produced comparable significant improvements in PHQ-9 scores in the context of PTSD, with fewer appointments in the EMDR arm. This indicates that EMDR might be more efficient, considering the severity of the PHQ-9 scores was also significantly higher in the EMDR baseline group before the intervention. EMDR also produced a larger improvement in PCL-5 scores compared to CBT.

# Discussion

In this chapter, the research aims and questions will be reviewed, a summary of the findings presented, and their meaning discussed, considering both the strengths and limitations of this study. Furthermore, the implications of these findings will be considered for policy and practice, theory, and research. Finally, future directions and a conclusion will be provided in this chapter.

## Aims and research questions

The existing interventions for depressive symptoms (such as pharmacotherapy or CBT) only tend to be effective for approximately 50% of clients (Bart et al., 2016; Hendriks et al., 2018). There is some evidence that these interventions are not curative but symptom-suppressive (Hollon et al., 2002) or have significant rates of relapse (Hollo et al., 1992; Fostick et al., 2010; Steiner et al., 2014). For example, Steinert et al. (2014) conducted a meta-analysis searching Medline, PsycINFO and the COCHRANE Library. 11 RCTs met the search criteria of at least 2 years post-treatment follow-up and depression as the primary presenting problem. This totalled 966 patients' data, with 4.4 years of mean follow-up duration and predominantly observer-rated depression measures, but also two self-report depression measures. The overall rate of relapse at the follow-up was 0.39 (95% CI 0.29, 0.50); thus, approximately 40% of people treated for depression had a relapse by the two-year follow-up. However, data was sparse due to the lack of RCTs with long-term follow-up. The studies included in this meta-analysis also had methodological differences, and one paper had a high heterogeneity of the research sample. Notably, the funnel plot and fail-safe N analysis suggested high

publication bias, potentially questioning whether there might be unpublished studies with non-significant results post-treatment. Since many people are still not helped by or relapse after existing depression treatments, the current study sought to evaluate outcomes following treatment as usual (CBT) and an alternative intervention (EMDR) that could also be effective in improving depression while minimising the risk of its recurrence (Carletto et al., 2021; Dominguez et al., 2021; Raissouni et al., 2023).

Some preliminary evidence suggests that EMDR is better at reducing recurrence than CBT. For instance, a meta-analysis and systematic review by Dominguez et al. (2021) examined 11 RCTs with 567 participants in total, using EMDR, trauma-focused therapies and imagery rescripting for depression. They found moderate effect sizes, with EMDR demonstrating superior outcomes to non-trauma-focused CBT as an active control group. They found that both EMDR and imagery rescripting demonstrated superior outcomes to inactive control conditions. Follow-up data was also most favourable for EMDR, with a moderate effect size, although only four studies included a follow-up between one to six months post-treatment. EMDR protocols used in these studies, as well as session duration and intensity, varied. Several studies were also at a high risk of bias and had small samples. Therefore, while promising, the results of this meta-analysis should be taken with caution, as only one study used an active control group, with the remaining studies having inactive control conditions. The main critique of this extensive study is that it is a review of efficacy and not effectiveness - that is, the studies under review, like most of the studies reviewed below, were RCTs and did not capture real-life practice data.

The primary research question of this study was whether EMDR outcomes for depression are at least comparable to TF-CBT outcomes for depression in a UK NHS primary care mental health service. Specifically, do the pre- and post-PHQ-9 scores differ according to therapy after controlling for baseline PTSD levels? The secondary research question was whether the EMDR intervention requires less overall treatment time compared to TF-CBT.

**Summary of findings**

The most central finding suggested by this study is that most clients were able to significantly reduce their levels of PHQ-9 scores in the context of PTSD (Manea et al., 2012) following a course of TF-CBT or EMDR. These results indicate that improvements in PHQ-9 scores in the context of PTSD following EMDR were comparable to treatment as usual for depressive symptoms (CBT), in reducing the level of PHQ-9 scores below the clinical threshold by the end of treatment for most clients who completed either of these therapies. Although the results of this study can only be considered preliminary due to the lack of randomisation and other factors, this study implies that further research would be beneficial on whether EMDR might provide at least the same benefit as CBT in reducing PHQ-9 scores in the context of PTSD, or on depression directly. These response rates are consistent with those reported in previous studies, suggesting that EMDR can lead to a reduction in depressive symptoms (DeRubeis et al., 2005; Hollon et al., 2005; Ostacoli et al., 2018).

It is important to note that the therapeutic target in this dataset was PTSD rather than depression or PHQ-9 scores. Nevertheless, previous studies investigating the

effects of EMDR in clients with PTSD have found similar results (Perlini et al., 2020; Kaptan et al., 2023). For example, Capezzani et al. (2013) compared EMDR with CBT for PTSD in patients in the oncology follow-up stage. A total of 21 individuals were randomly allocated to either EMDR or CBT. The Clinician-Administered PTSD Scale (CAPS) and the Impact of Event Scale-Revised (IES-R) were employed for PTSD assessment pre-intervention and one month post-treatment. The absence of PTSD post-treatment was highly correlated with receiving EMDR, and EMDR was significantly more effective than CBT in reducing both IES-R and the intrusive symptom subscale on CAPS. However, this study had a small sample, and all participants received only eight treatment sessions in total. It might be insufficient for many individuals, and CBT might just need more time to produce improvement, whereas EMDR might be just faster-acting rather than more effective. Although Capezzani's findings are preliminary, they tend to be consistent with the tendency noticed in the current study.

As regards the secondary outcome of the study, EMDR has been found to require a significantly lower treatment dose, fewer therapy sessions and fewer total therapy minutes than TF-CBT. This is in line with the previous studies finding that EMDR was more fast-acting than TF-CBT (Hofmann et al., 2016; Stanbury et al., 2020; Scelles & Bulnes, 2021). Faster-acting progress could mean less distress to clients who have already been suffering. It could also be appealing for clinical service providers, as it could mean lower therapist time and, therefore, lower waiting times for clients to commence therapy. This study, therefore, warrants further research.

**Limitations**

One of the most substantial limitations of this study is that PTSD was the primary target in these interventions in this dataset, whereas the main research question is focused on PHQ-9 scores. This has been somewhat controlled by using PCL-5 scores as a covariate in the main data analysis. In terms of the contents of EMDR and TF-CBT therapy, in the initial sessions, EMDR focuses on assessment and stabilisation, which is similar to TF-CBT. Following that initial phase, EMDR's distinct work on trauma reprocessing differs from reliving in TF-CBT. In this study, both interventions were addressing PTSD rather than depression directly. This means both were tackling traumatic memories, although in different ways. This might have reduced the differences that could have been observed between TF-CBT and EMDR if these interventions addressed depression directly. TF-CBT for depression protocols does not tend to relive unprocessed traumatic memories, although imagery rescripting might be involved (Wheatley & Hackmann, 2011). TF-CBT for depression usually focuses mainly on beliefs, rules, assumptions, attitudes, thoughts and coping/compensatory behaviours rather than on memories, which form a large part of trauma-focused TF-CBT for PTSD (Ehlers et al., 2005). EMDR therapy applied for depression would still be aimed at reprocessing traumatic memories, using either the standard protocol or specific EMDR for depression protocols, such as DeprEnd (Hofmann et al., 2016). Therefore, it would be helpful for future research to compare EMDR and TF-CBT, which address depression directly rather than primarily addressing PTSD. This could potentially reveal more differences between these two protocols as applied specifically to depression outcomes.

At the same time, depression and PTSD can often have similar components which overlap significantly. Both could be conceptualised as conditions in which adverse

life events often play a very key part, leading to dysfunctional memories, beliefs or actions. Exposure to either big T or small t traumas or critical life events can lead to PTSD and/or depression (De Jongh et al., 2024) and are more likely to lead to PTSD and/or depression if there is already experience of childhood trauma or attachment trauma, such as rupture and lack of repair in childhood, or an introjected critical parent (Brayne, 2008). This raises the question of whether depression and PTSD are really that different. Moreover, if these two conditions are similar in aetiology and presentation, then why would the same treatment that is effective for PTSD not be effective for depression? This way, it might seem unsurprising that depression tends to respond well to EMDR, too.

Moreover, the AIP model – the current working theory underlying EMDR – is not an entirely conclusive mechanism of action behind EMDR. Some scepticism surrounds EMDR, and some theorise that a person's suggestibility can play a big part in the EMDR mechanism of action (Ficorilli, 2018). More importantly, memory reconsolidation theory might play a key role in EMDR. According to the memory reconsolidation theory, memories retrieved from long-term memory into working memory are again stored in long-term memory. Then, these altered memories can permanently replace the original traumatic memories, making them benign (Manfield et al., 2017).

Furthermore, it is important not to overgeneralise the results of the current research project, as this is a retrospective cohort study. All participants were clients of one NHS service in the South East of England. As can be seen from the demographic, the vast majority of participants were White British females, which is

not representative of the general population. Future studies could benefit from a multisite design in different countries and gather data from a broad range of participants in terms of ethnicity, nationality, gender and age.

This study is also non-randomised, which means that individuals with a preference for EMDR were assigned to EMDR. Therefore, this might have affected their engagement and speed of response.

One of the debated methodological challenges - outliers - has also been carefully considered. Outliers are data points that substantially deviate from others (Aguinis et al., 2013) and have been removed to prevent them from skewing the results, as these extreme values can also impact statistical power, making it challenging to identify a true effect if there is one (André, 2022). Although outlier handling has been a subject of controversy and debate in quantitative psychological research because, on the one hand, excluding genuine data could lead to incorrect conclusions about reality, as individuals who significantly deviate from the average "norm" certainly exist in the real world outside of research settings. Bakker and Wicherts, 2014 suggested that the preferred practice is to explicate the handling of outliers in advance. The outliers filter in this study was set prior to any statistical analyses. Upon inspection of distribution graphs, outliers seem to inflate the effect size, skewing the central tendency of the data set in favour of EMDR, so it was important to remove them to reduce the probability of a Type II error. Although filtering out the outliers can have its drawbacks, such as minimising the true population estimate (Ghosh & Vogt, 2012). Outliers in this study are genuine rather than due to error since the retrospective data has been carefully collected and

extracted. However, all things considered, it has been decided to filter out outliers in this study because, while the excluded data points likely were "real" data, these could not be included in these statistical analyses as these analyses are sensitive to extreme values. Nevertheless, these extreme values might still be indicative of something that is worth considering in future studies.

It is important to note that outliers were largely more extreme values in favour of EMDR, such as significantly longer treatment duration in the TF-CBT group and significantly shorter treatment duration in the TF-CBT group. For example, a couple of individuals in the TF-CBT group received an unusually large number of sessions. Including this data in the analysis would suggest an even larger difference between EMDR and TF-CBT in the number and duration of sessions, whereas the findings, even without these extreme values, already suggest that EMDR requires significantly fewer sessions and minutes than TF-CBT. Therefore, the findings would not differ in essence from what they are; they might have had a higher effect size and be more sensational. It can be helpful to be more modest in findings so as not to overestimate the effects, especially since the sample of this study is not representative of the general population. Hence, future research needs to consider the handling of outliers carefully.

Another important limitation is that it is not known whether these clients have been taking antidepressant medications before or during these interventions. That could skew the results potentially in favour of those individuals who have been taking and responding to antidepressants, diluting the true effect of a given

intervention. Therefore, future studies should collect information on the psychotropic medication status.

Moreover, the primary outcome measures in this study were self-report (PHQ-9 and PCL-5). Such measures are subject to social desirability bias, and it might also be difficult for individuals to accurately estimate their levels of depressive and PTSD difficulties. In particular, if a client developed a good therapeutic alliance with their therapist, sometimes it might be possible for the client to underreport their difficulties in their final sessions due to wanting to please their therapist and not disappoint, so wanting to demonstrate good outcomes. At the same time, some other individuals might, on the contrary, overreport in their last session to signal that their therapy should continue as they still need it. This could also be in combination with attachment difficulties or social isolation that an individual might be experiencing, so attempting to hang on to their therapist. Thus, for various reasons, future studies could include more objective measures administered by independent clinicians to overcome this limitation.

A further considerable limitation is the absence of a post-therapy follow-up evaluation to examine the longevity of therapy outcomes, especially considering the high recurrence rates of subsequent depressive episodes (Keller, 2001; Perlini et al., 2020; Dominguez et al., 2021; Raissouni et al., 2023). For these reasons, post-treatment follow-ups at 6 months, 1 year or longer would be required to identify any differences in longevity of outcomes. This could help to find an intervention with the highest reduction in total distress of an individual who suffers from each depressive episode. In practical settings, this could also reduce waiting times in

clinical settings if individuals do not need to repeatedly and frequently return for more therapy with each episode, and rather stay well for a long time.

Although in this retrospective secondary data analysis design, it would be minimal, it is also crucial to note that this study was not double-blinded and is subject to researcher bias, especially considering the researcher's own experience of recurrent depressive episodes and really wanting to find a way to help address the core of this difficult condition and desire to reduce suffering for others who experience this terrible condition. Therefore, it could be possible for researcher bias to interfere with the interpretation of results. However, careful attention has been given to ensure that design, data collection, analyses and interpretation are done correctly, under relatively objective expert supervision. Having said that, it would be crucial for future studies to be adequately double-blinded as it is good practice and would aid in minimising researcher bias.

Another consideration is the fact that in this service, there is no limit to how many times a client can self-refer to the service and have up to three courses of various therapies. This could potentially mean that prior to TF-CBT or EMDR interventions in this study, clients could have had up to sixty prior sessions several times in past referral episodes. This could involve either a course of CBT, EMDR, Acceptance and Commitment Therapy (ACT), Compassion-Focussed Therapy (CFT), Narrative Exposure Therapy (NET), Dynamic Interpersonal Therapy (DIT), Interpersonal Therapy (IPT), Couples Therapy, counselling or guided self-help. Therefore, the outcomes following the interventions in this study could be not just due to the

treatments in this instance. However, there could potentially be cumulative effects, including any prior therapies these clients might have already had before.

**Strengths**

The real-world practice-based dataset used in this study is one of its main strengths, as in vivo findings are more transferable to actual clinical settings compared to those of randomised highly controlled trials, which often exclude real-life presentations with "complexities."

This study also had a large dataset and good statistical power. Considering that studies exploring EMDR for depressive symptoms primarily have small sample sizes and weak statistical power, this is a significant strength.

**Implications of the findings**

***Implications for policy and practice***

The findings of this study suggest that it might potentially be helpful to offer a choice of either EMDR or TF-CBT to clients not only suffering from PTSD but also to individuals suffering from depression, especially if they have already not responded to currently practised interventions for depression. The findings relating to the potentially more rapid response to EMDR compared to TF-CBT could be of particular interest not only to clients and therapists who would like to reduce an individual's distress faster but also to NHS services and commissioners who might like to reduce pressures on the waiting lists, thus, further increasing the speed of distress reduction, as clients will be accessing treatment quicker if the total treatment time is shorter.

### *Implications for theory*

Based on this study, it would be important to further consider theoretical models of depression and the role of small t or big T traumatic life experiences. Considering that the neurotransmitter theory is largely dispelled (Moncrieff et al., 2023) and existing treatments for depression are not effective or short-lived for a significant proportion of individuals (Steinert et al., 2014), it is especially important to explore alternative models of depression.

### *Implications for research*

It would be helpful for future studies to investigate the effects of EMDR directly for depression and further examine the required treatment dose of EMDR compared to other interventions for depression, such as TF-CBT. It would also be important to employ a gold standard method of comparing therapy effects (Stefanos et al., 2020) - prospective randomised controlled trials with non-inferiority as well as superiority designs. Randomised controlled trials could help further thoroughly investigate this area from various angles, controlling for various confounding variables.

Mixed methods or qualitative research in this area could also help to better understand the mechanisms of action behind EMDR, AIP, and memory reconsolidation theory, as well as clients' phenomenological experiences.

## Future directions

The following steps for this study would be to be published in a peer-reviewed journal and other ways of disseminating these findings via presentations at national and international conferences for the British Psychological Society, EMDR and

depression, as well as at services and meetings with commissioners. Further research in this area is also being planned, especially as a prospective comparison efficacy study and a qualitative exploration of clients' experiences of EMDR for depression.

**Conclusion**

To the best of our knowledge, this is the first well-powered study in a clinical NHS setting investigating PHQ-9 score reductions following EMDR or TF-CBT for PTSD and finding EMDR to be comparable to TF-CBT. The findings of this study are consistent with previous research (Hofmann et al., 2016; Stanbury et al., 2020; Scelles & Bulnes, 2021). These research outcomes support further studies on EMDR being included as an approach to depression. It might also help to consider exploring conceptualising depression as a trauma response. For some individuals, treating depression from this angle might potentially be more fruitful than currently available interventions with limited response and longevity. Due to the significant costs and burden of depression on our society, reducing depression in individuals could be hugely beneficial not just to individuals suffering from depression but to our society in general.

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## Appendices

Appendix 1. RD1 approval letter

UWE Bristol University of the West of England | **Graduate School**

Marina Ulanova
DCP Researcher
School of Social Sciences
College of Health, Science and Society

02/06/2023

Dear Marina,

**RESEARCH PROJECT REGISTRATION (RD1):**
*A retrospective evaluation of eye movement desensitisation and reprocessing versus cognitive behavioural therapy for depression in a primary care mental health service.*

Following a meeting of the Faculty Research Degrees Committee (FRDC), I am pleased to inform you that your application for part-time DCP registration within the College of Health, Science and Society has been approved. The Committee noted that your research degree registration started on 13/09/2021.

The FRDC has confirmed your supervision team as follows:

| | |
|---|---|
| **Director of Studies (DoS)** | Ms Christine Ramsey-Wade |
| **Second Supervisor 1** | Dr Bruna Nascimento |

Please note that there are additional resources available for the development of your skills as a postgraduate researcher in addition to taught modules. Please see the Graduate School website for more information about skills development workshops.

The FRDC considered your project proposal carefully, including a consideration of ethics and research governance. If you have answered "yes" to any of the questions in Section 5 of the RD1 relating to ethics then please note that it is your responsibility to ensure that your proposal is considered by the Faculty Research Ethics Committee (FREC) before you begin your data collection.

Please get in touch with the Research Ethics Committee Secretary by emailing researchethics@uwe.ac.uk stating that you are a postgraduate researcher who is required to submit an application for approval. Please also give the name of your Director of Studies.

As part of your research degree you will be required to complete a Progression Examination. This is a mandatory assessment involving two independent examiners (outside of your supervision team) who will review your written work and performance under viva voce exam conditions. You and your DoS share responsibility for ensuring that the following sequence of deadlines is met:

| | |
|---|---|
| **Examiner Nomination (RD2a form):** | 01/01/2024 |
| **Progression Report Due:** | 01/02/2024 |
| **Progression Exam Due:** | 01/03/2024 |
| **Exam outcome (RD2c form) Due:** | 01/04/2024 |

Please note that if your examiners conclude that your progress has been unsatisfactory on the basis of your report and viva voce examination, it may be recommended that your registration be withdrawn. You and your supervisors can find out more about the progression exam from the Graduate School Handbook.

Following successful progression onto stage two of your research degree you will be required to demonstrate satisfactory progression at each subsequent stage of your registration. You will be required to submit further reports and evidence as part of Progress Review (PR). The deadlines for completion of these milestones are:

| | |
|---|---|
| **Progress Review Stage 2/ 3 (PR3 with draft thesis only) complete by:** | 01/04/2025 |
| **Expected thesis submission *OR* Progress Review Stage 3 complete by:** | 01/10/2025 |
| **Maximum registration:** | 12/09/2027 |

It is important to note that both you and your supervision team share joint responsibility for the timely completion of each milestone and engaging with the administrative requirements as set out by the Graduate School. If you do not successfully complete any of the Progress Review points your registration will be at risk and you may be withdrawn from your research degree. You are advised to familiarise yourself with the contents of the Graduate School Handbook, Code of Practice and Academic Regulations, all of which can be found the Graduate School webpages.

Please visit https://www1.uwe.ac.uk/research/postgraduateresearchstudy/skillsdevelopment.aspx to see all the skills development opportunities available to UWE postgraduate researchers. May I particularly highlight the Progression Exam workshop, to help you prepare for this next important milestone in your PGR studies.

Where applicable, please note that the above stated milestone dates do not necessarily correspond with your visa end date, nor with the end dates of any funding arrangements you may have in place. It is your responsibility to be aware of any funding and/or visa arrangements, and to action these accordingly at the appropriate times.

If you experience any issues affecting your ability to continue with your research as expected, please get in touch with the Graduate School as early as possible so that they can advise you accordingly.

Yours sincerely

**Appendix 2. Ethical approval letter.**

College of Health, Science & Society
Glenside Campus
Blackberry Hill
Stapleton
Bristol BS16 1DD

Tel: 0117 328 1170

UWE REC REF No: HAS.23.06.138

22nd September 2023

Marina Ulanova

Dear Marina

**Project title: A retrospective evaluation of depression outcomes following Eye Movement Desensitisation and Reprocessing versus Cognitive Behavioural Therapy in a UK primary care psychological service**

I am writing to confirm that the CHSS REC is satisfied that you have addressed all the conditions relating to our previous letter sent on 25th August 2023 and that the project has now been given ethical approval to proceed until 30th May 2025.

The following standard conditions apply to all research given ethical approval by a UWE Research Ethics Committee:

1. You must notify the relevant UWE Research Ethics Committee in advance if you wish to make significant amendments to the original application: these include any changes to the study protocol which have an ethical dimension. Please note that any changes approved by an external research ethics committee must also be communicated to the relevant UWE committee.
2. You must notify the College Research Ethics Committee if you terminate your research before completion.
3. You must notify the College Research Ethics Committee if there are any serious events or developments in the research that have an ethical dimension.

**Failure to fulfil these conditions may mean that approval is withdrawn.**

Please ensure that before proceeding with your research:

- You have sought contractual advice from the UWE Contracts Team

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## Appendix 3. Collaboration Agreement



**COLLABORATION AGREEMENT**

**between**

**UNIVERSITY OF THE WEST OF ENGLAND, BRISTOL**
**and**
**SOLENT NHS TRUST, A PART OF THE NATIONAL HEALTH SERVICE**

COLLABORATION AGREEMENT

between

**SOLENT NHS TRUST, A PART OF THE NATIONAL HEALTH SERVICE**, having its main administrative offices at HighPoint Venue, Bursledon Rd, Southampton SO19 8BR ("**NHS Trust**")

and

**UNIVERSITY OF THE WEST OF ENGLAND, BRISTOL,** a Higher Education Corporation whose administrative offices are at Frenchay Campus, Coldharbour Lane, Bristol, BS16 1QY ("**UWE**")

hereinafter referred to as the "Parties" and each of them being a "Party")

In this Agreement NHS Trust shall be referred to as the "Collaborator"

BACKGROUND

A. Marina Ulanova is studying at UWE on a Professional Doctorate in Counselling Psychology programme, and for her Doctoral Research project Marina would like to use the data while she is working for the NHS Trust to contribute to her thesis. NHS Trust agreed for Marina to use routinely collected client data that is already collected and stored on the secure electronic database and use the results she generated through the data set for her thesis in respect of a project titled "A retrospective evaluation of depression outcomes following Eye Movement Desensitisation and Reprocessing versus Cognitive Behavioural Therapy in a UK primary care psychological service" (the "**Project**"), The Co-investigator is the Director of Studies Christine Ramsey-Wade at UWE.

TERMS AND CONDITIONS

It is hereby agreed as follows:

1. The Project shall commence on the 23rd of October 2023 and shall continue for two years unless terminated earlier in accordance with this Agreement. The Parties will co-operate to perform the Project. The tasks to be undertaken by each Party for the Project are listed at Part 1 of the Schedule to this Agreement (the "**Proposal**"). The Parties agree to perform such tasks with reasonable skill and care.

2. The maximum liability of a Party under this Agreement shall not exceed the sums to be paid to it under this Agreement and shall not, in any case extend to indirect or consequential losses. Nothing in this Agreement limits or excludes any Party's liability for (a) death or personal injury resulting from negligence; or (b) any fraud or for any sort of other liability which, by law, cannot be limited or excluded.

3. The funding provided by UWE to the Collaborator for the Project is £1, inclusive of VAT if applicable.

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**SCHEDULE**

**Part 1**

**Design**

The design of this study would be a quantitative quasi-experimental retrospective outcome evaluation with two independent groups - the intervention group (EMDR) and the active control group (TAU CBT). Pre- and post- measures for each group would have been collected prior to the intervention and post-intervention, considering baseline depression levels. The number and length of attended sessions would also be recorded for each participant. Treatment group would be the independent variable, and depressive and PTSD scores would be dependent variables, measured by reliable and valid questionnaires such as the Patient Health Questionnaire (PHQ-9) and the Post-traumatic stress disorder Checklist (PCL-5).

**Setting and Participants**

The study would take place in an NHS primary care psychological therapies service. Both CBT and EMDR are routinely offered in this service for PTSD. As NHS services are guided by the NICE recommendations, this service offers EMDR for PTSD only and CBT for PTSD, Depression and other difficulties. Therefore, participants of this study would have received EMDR or CBT for PTSD. However, depressive symptoms will be the focus of this study. The statistical analysis will control for PTSD symptoms by using ANCOVA to analyse data. The baseline levels of depression will be taken into consideration.

**The procedure of data collection**

Data is routinely collected for each client at every session using the PHQ-9 questionnaire (Kroenke et al., 2001) for depression. For clients presenting with PTSD, data is also collected via the PCL-5 (Blevins et al., 2015) a PTSD questionnaire. Each session is routinely recorded

on the electronic database IAPTus and demographic data, such as age, ethnicity and gender, is routinely collected at the point of each referral.

Consent for GDPR, terms and conditions, including anonymised use of data for research, audit and service evaluation, is routinely collected at the point of referral.

This study will entail Marina Ulanova manually extracting the aforementioned retrospective secondary data from an electronic database IAPTus, including all cases that completed high-intensity CBT or EMDR for PTSD in two years between January 2021 and December 2022 inclusively.

Data extraction from the secure electronic database onto an excel spreadsheet will entail double data entry, to ensure internal validity of the project and integrity of data by preventing errors or typos. Data will be crosschecked to ensure no discrepancies between double datasets. Data will then be coded using numerical values. As per the SPSS survival manual (Plant, 2020), the dataset in the excel spreadsheet will be checked for errors and scores that are out of range of possible value of a variable. For instance, gender will be coded 1=female, 2=male, 3=other, therefore, no other values but 1, 2 and 3 should be found in that column. The range of PHQ-9 scores is 0-27, hence, 28 or above should not be fund for that column. Subsequently, the source of error would be located and corrected, where possible. Furthermore, the dataset will be checked for errors in SPSS, as per Plant's (2020) SPSS survival manual procedure (for example, for categorical variables: analyse-descriptive statistics-choose the categorical variables-move them into the variables box-click on statistics, tick minimum and maximum in the dispersion section-continue-ok). The number of valid or missing cases will be checked and the root cause identified, where possible.

# Appendix 4. Risk Assessment Form and Health & Safety arrangements.

University of the West of England BRISTOL

## GENERAL RISK ASSESSMENT FORM

**Ref:**

| **Describe the activity being assessed:** Research Project – secondary data analysis of NHS patient records | **Assessed by:** Christine Ramsey-Wade | **Endorsed by:** Bruna da Silva Nascimento |
|---|---|---|
| **Who might be harmed:** Original patients and/or researcher<br>**How many exposed to risk:** 580 + researcher | **Date of Assessment:** 15/07/2023 | **Review date(s):** |

| Hazards Identified *(state the potential harm)* | Existing Control Measures | S | L | Risk Level | Additional Control Measures | S | L | Risk Level | By whom and by when | Date completed |
|---|---|---|---|---|---|---|---|---|---|---|
| Confidential anonymised coded patient data might be improperly processed or intercepted when input into the SPSS statistical analysis software. | Confidential data will be anonymised and coded. It will also remain on the NHS Trust virtual network and not going to be extracted from the encrypted, password-protected NHS Trust work laptop. | 1 | 1 | 1 | The excel spreadsheet containing anonymised coded data will be password-protected. | 1 | 1 | 1 | Marina Ulanova. Student – when data extraction commences – pending ethical approval | |
| Processing a large dataset like this will involve excessive desk and computer use, putting the PGR at risk of physical strain. | PGR is already trained on DSE computer screen use through employer. | 1 | 1 | 1 | PGR will monitor her physical well-being and take regular screen breaks as needed. | 1 | 1 | 1 | Marina Ulanova. Student | |
| | | | | | | | | | | |



**RISK MATRIX: (To generate the risk level).**

| | | | | | |
|---|---|---|---|---|---|
| **Very likely 5** | 5 | 10 | 15 | 20 | 25 |
| **Likely 4** | 4 | 8 | 12 | 16 | 20 |
| **Possible 3** | 3 | 6 | 9 | 12 | 15 |
| **Unlikely 2** | 2 | 4 | 6 | 8 | 10 |
| **Extremely unlikely 1** | 1 | 2 | 3 | 4 | 5 |
| **Likelihood (L) ↑ / Severity (S) →** | **Minor injury – No first aid treatment required 1** | **Minor injury – Requires First Aid Treatment 2** | **Injury - requires GP treatment or Hospital attendance 3** | **Major Injury 4** | **Fatality 5** |

**ACTION LEVEL: (To identify what action needs to be taken).**

| POINTS: | RISK LEVEL: | ACTION: |
|---|---|---|
| 1 – 2 | NEGLIGIBLE | No further action is necessary. |
| 3 – 5 | TOLERABLE | Where possible, reduce the risk further |
| 6 - 12 | MODERATE | Additional control measures are required |
| 15 – 16 | HIGH | Immediate action is necessary |
| 20 - 25 | INTOLERABLE | Stop the activity/ do not start the activity |

**Appendix 5. Research Data Management Plan**.

# Research Data Management Plan

This is the UWE Bristol research data management plan template.

- The template applies to all research; you are required to fill this in before collecting any data as part of research, or using any data for research.
- You must do this for all research, whether externally or internally funded, as part of scholarship time, or doctoral student research.
- Doctoral students should complete this in conjunction with their DOS/Supervisory team.
- You should update this research data management plan as appropriate, but please always keep prior versions on the Research Governance Record.

Research data management plans for staff and doctoral research must be uploaded to the UWE Research Governance Record. The DOS must do this for doctoral research. This template is available for use by supervisors with taught programme students, but does not, at this point, need to be uploaded to the Research Governance Record (although it is advised that this form should form the basis for a proportionate RDM for all student research).

Please download a fresh copy of the template from the Library's website each time you need to use it; this will ensure that you are using the most up to date version. If you do not use the current version, you may be asked to do it again.

**Please refer to the guidance notes before answering each question (accessed by hyperlink from each question).**

You may also find the following sources of guidance helpful:

UWE Bristol Research Governance Guidance, including the UWE Bristol Code of Good Research Conduct

UWE Bristol Research Data Protection Standard

UWE Bristol Research Ethics Guidance

The Human Tissue Quality Management System (where appropriate)

The Animal and Animal Welfare Quality Management System (where appropriate). For access to this guidance, please contact the Research Governance Team.

Library Services guidance on research data management

Information Security Toolkit

# Research Data Management Plan

| | |
|---|---|
| UWE Project manager name: | Christine Ramsey-Wade |
| Student name, where applicable: | Marina Ulanova |
| Faculty: | Health and Applied Sciences (HAS) |
| Project Title: | A retrospective evaluation of depression outcomes following Eye Movement Desensitisation and Reprocessing (EMDR) versus Cognitive Behavioural Therapy (CBT) in a UK primary care psychological service |

| | |
|---|---|
| Research Data Management Plan version number: | 1 |
| Date: | 05/09/2023 |

| If you have the following reference numbers, please enter them below. | |
|---|---|
| PIMS REF number: | Click or tap here to enter text. |
| URESC / FREC / AWESC application numbers: | HAS.23.06.138 |
| HTSC registration number: | Click or tap here to enter text. |
| GM registration number: | Click or tap here to enter text. |

Q1. What data will you collect, create or use? Give a brief description. See Note 1

The source of the data

The source of the data for this study is a third party. This study will involve a secondary retrospective electronic data analysis of clients who have accessed an NHS primary care psychological therapies service. Adults (18+) living in the Portsmouth area can self-refer or be referred by a professional to access this service.

The volume of data and number of data subjects

In order to fully power this study, this study will seek to download and analyse 580 case files from 580 data subjects.

Data subjects

Inclusion criteria for this service are mild to severe depression, anxiety disorders or post-traumatic stress disorder (PTSD). Significant risks to the safety of the client or others, as well as significant substance misuse or severe and enduring mental health difficulties, such as active personality disorders or psychosis, are exclusion criteria in this service.

Purpose of data collection

The purpose of data collection is to compare treatment outcomes for EMDR vs TAU for adults with depression.

Demographic data

Consent for GDPR, terms and conditions, including anonymised use of data for research, audit and service evaluation, is routinely collected at the point of referral to this NHS psychological therapies service. Data is recorded on the secure electronic database IAPTus and demographic data, such as age, ethnicity and gender, is going to be extracted in order to control for potential age, ethnicity and gender variations in terms of response to interventions. For instance, it might be that individuals from diverse ethnic backgrounds could respond to CBT and EMDR interventions not as significantly as individuals from non-diverse backgrounds. This might warrant further considerations for the need to adapt Western interventions to individuals from ethnic minorities.

Q2. How will you collect, create or access the data? See Note 2

Data is routinely collected for each client at every session using the Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001) for depression. For clients presenting with PTSD, data is also collected via the Post-traumatic stress disorder Checklist (PCL-5) (Blevins et al., 2015) - a PTSD questionnaire. Each session is routinely recorded on the electronic database IAPTus and demographic data, such as age, ethnicity and gender, is routinely collected at the point of each referral. Consent for GDPR and service terms and conditions, which include anonymised use of data for research, audit and service evaluation, is routinely collected at the point of referral. This study will entail manually extracting the aforementioned retrospective secondary data from an electronic database, including all cases that completed high-intensity CBT or EMDR for PTSD in two years between January 2021 and December 2022 inclusively.

As an employee of this Trust, the student has routine access to the electronic database that stores the required data for this project. The following individuals have been consulted and granted their approval for this project, confirming the data handling process is acceptable (please see their written confirmations attached):

| |
|---|
| · The Data Protection Officer, Head of Information Governance and Digital Security at the Information Governance Team who also manages the Caldicott Guardian queries in the Solent NHS Trust;<br>· Head of Improvement at the NHS Trust Academy of Research and Improvement, Solent NHS Trust;<br>· Professional Lead, Psychological Services, Consultant Psychologist, Solent NHS Trust.<br><br>As this is an evaluation of existing data, this project has been classed as a service evaluation and, therefore, does not require additional NHS ethical approval. |
| Q3. Please classify your data here as public, restricted or confidential. See Note 3 |
| Confidential. |
| Q4. How will the data be stored and backed up at all stages during its life course? See Note 4 |
| Data will be anonymised using numerical codes (e.g., 1 for male, 2 for female). No patient identifiable data will leave the secure NHS Trust's cyber security patching environment. It will be stored on the encrypted password-protected trust laptop of the student. Only the variables of interest will be considered in the data analysis and no identifiable information will be included. |
| Q5. How will the data be documented, described and maintained? See Note 5 |
| Data will be anonymised and the coding key will be kept separately to maintain participants' confidentiality. |
| Q6. How will your data be processed? See Note 6 |
| Only the student will have access to the raw data. No patient identifiable data will leave secure NHS Trust's cyber security patching environment. It will be stored on the encrypted password-protected trust laptop of the student.<br><br>SPSS files containing only the data under analysis, once it has been fully anonymised, will only be accessed by the PGR and her supervision team. |
| Q7. Does the Data Protection Act (2018) apply to your research? See Note 7 |
| Yes, the Data Protection Act (2018) as implemented in the General Data Protection Regulation (GDPR). The principles of GDPR are lawfulness, fairness, transparency; purpose limitation; integrity and confidentiality; accountability; storage limitation; data |

minimisation and accuracy. In order to comply with these principles, the PGR will ensure the following:

**Data minimisation**

Only necessary minimal data will be collected for the purposes of this study;

**Accuracy**

The PGR will diligently cross-check the data for accuracy and will share with the supervision team who could also check for errors;

**Storage Limitation**

Once this project is complete, the data will be deleted.

**Integrity and confidentiality**

General risk assessment form has been completed and endorsed, outlining the measures to protect all data and to preserve confidentiality. This is going to be done by ensuring that all data remains on the secure virtual Trust network and on the encrypted password-protected Trust laptop, with all data anonymised and coded in a password-protected file before analysis.

**Purpose limitation**

The data will be used for the purposes of this study only.

**Accountability**

The PGR will be accountable for protecting the data.

**Lawfulness, fairness and transparency**

All data is collected lawfully, fairly and transparently. Clients have been informed of the data collection and provided informed consent.

Q8. Export controls and other legislation and regulation. See Note 8

N/a

Q9. What Intellectual Property will be created or used in this research? See Note 9

Nil.

Q10. What are your plans for long-term preservation and data sharing, where appropriate, and data disposal? See Note 10

No personal identifiable data will be collected. All data will be anonymised as soon as it is extracted and coded for data analysis. SPSS data files as well other files for this project will be destroyed once the project is completed. However, the primary original data will still remain in the NHS electronic IAPTus system, in line with the NHS Information Governance policies and Data Protection Act (2018).

It would not be appropriate to preserve this data for longer due to GDPR principles of storage limitation, purpose limitation, lawfulness, fairness and transparency, since clients

| |
|---|
| provided their consent for their data to be used within this Trust, but have not been informed and, hence, did not consent to have their data shared outside of this Trust. |
| Q11. Who is responsible for enacting the different elements of the research data management plan? See Note 11 |
| The student, Director of Studies and Second Supervisor. |
| Q12. What resources are needed to deliver the plan, and are these available? See Note 12 |
| Yes, all required resources to deliver the plan are available. These are time, effort and Trust laptop of the student. |

## Appendix 6. Service Terms and Conditions Consent and GDPR.

Solent NHS
NHS Trust

**Talking Therapies Portsmouth (Primary Care Psychological Services)**
**Terms and Conditions of Attendance and Engagement**

1 All the talking therapy programmes we offer require commitment and input from you. In order to benefit, you need to attend agreed meetings. In some circumstances it may be possible to arrange a support session via telephone if it is not possible for you to attend in person. These Terms and Conditions are here to help us keep empty appointments to a minimum and to keep waiting times fair for everybody.

2 We aim to offer at least three different choices of locations or times (including evenings or Saturdays) for therapy. We ask you to offer us sufficient flexibility to attend, however if we are still unable to find you a suitable appointment within two months (60 days) of you being on the waiting list, then we will discharge you and you will need to refer again when you can attend more easily. If you have been offered an appointment matching your desired venue, or two evenings or a Saturday treatment slot (note evening/Saturday appointments are only available at the Pompey Centre), which have been refused, we will discharge you and you can refer yourself again when you have more flexibility.

3 **Any additional assessment following your triage** If you do not attend (DNA) an assessment without letting us know beforehand, then we will contact you by telephone to find out if you still want support from us. If we cannot get hold of you, we will send you a letter asking you to contact us within 7 days, if you wish to re book an assessment. If you contact us within the 7 days you will be offered another assessment. If we do not hear from you within 7 days, we will discharge you. If you cancel up to 2 consecutive assessment appointments within a referral episode, we will discharge you from the service. If any further DNAs occur, discharge will be automatic.

4 **Ongoing Treatment Appointments** If you do not attend (DNA) an ongoing appointment without letting us know beforehand, then we will contact you by telephone to find out if you still want support from us. If we cannot get hold of you we will send you a letter asking you contact us within 7 days, if you wish to continue with your therapy. Your next appointment will be cancelled and if you contact us you will need to go back on the wait list if your appointment has been offered to someone else. If we do not hear from you within 7 days you will be discharged. You can cancel a maximum of **2 treatment sessions** (with 24 hours prior notice) before you will be discharged. If any further DNAs occur, discharge will be automatic.

5 **Courses/Group Treatment Appointments** It is compulsory for you to attend the first session of a course/group program. If you are unable to attend this session you will be offered the next available group/course instead. You can cancel one session if you give more than 24 hours' notice. If you cancel more than one session, you will not be allowed to continue with that group/course. If you do not attend (DNA) a session, without letting us know, we will discharge you from the service.

6 If you have four or more different referral episodes where you do not attend for, or engage with therapy as in points 3 and 4 above, or failed to attend therapy repeatedly in the last 2 years, we will ask you to have a **6 month break** before re-referring yourself to Talking Therapies Portsmouth.

7 Any anticipated dates of absence should be identified at the beginning of your therapy programme (i.e. holiday or work commitments). If more than 2 sessions are likely to be missed, the start of the programme can either be postponed or a planned break in the programme can be arranged. This should be discussed with your practitioner/therapist/counsellor at your assessment appointment. Planned or unplanned absence of the practitioner/therapist/counsellor will be discussed in advance and will not impact upon the maximum number of sessions offered.

8 If you attend more than 10 minutes late for either individual or group sessions, it is unlikely the therapist will allow that individual therapy session to go ahead or let you join that group session at that point.

9 We have a zero-tolerance policy. Assessment and ongoing therapy sessions will not go ahead if you are under the influence of alcohol or drugs or demonstrate physical or verbal violence.

## Appendix 7. UWE conference 4th of September 2023 - presentation slides

# RATIONALE

- DEP CAN BE CONCEPTUALISED AS UNPROCESSED MEMORIES OF SMALL AND BIG T TRAUMAS
- STRONG POSITIVE CORRELATION BETWEEN ACES AND DEPRESSION (EGE ET AL, 2015)
- STRESSFUL LIFE MEMORIES ARE ASSOCIATED WITH RUMINATION WHICH IS LINKED WITH DEP. RUMINATION IS LINKED W TRAUMA. STUDIES INDICATE THAT RUMINATION CAN BE SIGNIFICANTLY REDUCED BY INTERVENTIONS WHICH FOCUS ON TRAUMA MEMORIES (MILLON ET AL, 2018).
- EMDR IS HIGHLY EFFECTIVE FOR PROCESSING TRAUMATIC MEMORIES AND IS RECOMMENDED BY NICE GUIDELINES FOR PTSD (NICE, 2018)
- EMDR OFTEN ACHIEVES TX GAINS IN FEWER SESSIONS THAN CBT (DE ROOS ET AL, 2011).
- EMERGING EVIDENCE SUGGESTS THAT EMDR CAN BE EFFECTIVE FOR DEP (VALIENTE-GÓMEZ ET AL, 2017).
- LACK OF PRIMARY CARE CLINICAL SETTING STUDIES. RCTS STUDIES TEND TO EXCLUDE INDIVIDUALS W COMORBIDITIES AND FOCUS ON INDIVIDUALS WHO TEND TO BE A LOT HEALTHIER THAN ACTUAL POPULATION WE INTEND TO TREAT W COMORBIDITIES AND VARIOUS COMPLEXITIES
- LACK OF LARGE SAMPLE WELL-POWERED STUDIES EVALUATING DEPRESSION OUTCOMES FOLLOWING EMDR

# AIMS AND OBJECTIVES

- MORE STUDIES OF EMDR FOR DEP COULD LEAD TO NICE RECOMMENDING EMDR FOR DEPRESSION

⇒OFFERED IN NHS

⇒ MORE PEOPLE WHO DID NOT RESPOND TO TAU COULD END THEIR SUFFERING FROM DEPRESSION

⇒ SUICIDE RATES ANS PHYSICAL HEALTH IMPROVEMENTS

⇒ BURDEN OF DISEASE REDUCED

- AIM IS TO PERFORM A SECONDARY DATA ANALYSIS EVALUATING DEPRESSION OUTCOMES FOLLOWING EMDR COMPARED TO TAU CBT IN A PRIMARY CARE NHS SETTING

- RQ:
- **THE PRIMARY RESEARCH QUESTION**
- ARE EMDR OUTCOMES FOR DEPRESSION AT LEAST COMPARABLE TO CBT OUTCOMES FOR DEPRESSION?
- **THE SECONDARY RESEARCH QUESTION**
- DOES EMDR REQUIRES LESS OVERALL TREATMENT TIME COMPARED TO CBT?
- DEMOGRAPHIC DETAILS SUCH AS AGE, GENDER AND ETHNICITY WILL ALSO BE ANALYSED TO EXPLORE ANY DEMOGRAPHIC VARIATIONS IN OUTCOMES

# METHODOLOGY

- QUANTITIVE COMPARATIVE RETROSPECTIVE SECONDARY DATA ANALYSIS, QUASI-EXPERIMENTAL DESIGN
- STATISTICAL POWER CALCULATION DETERMINED THAT 580 PARTICIPANTS WOULD BE THE OPTIMAL TOTAL NUMBER OF PARTICIPANTS FOR A WELL POWERED STUDY (A = 0.05, F=0.15 REQUIRES A TOTAL SAMPLE SIZE OF AROUND 580 PARTICIPANTS TO REACH A POWER (1–B) EQUAL TO 95%).
- MANUALLY EXTRACT THE FOLLOWING DATA FROM THE ELECTRONIC DATABASE FOR COMPLETED CBT AND EMDR CASES FROM JAN 2022-DEC 2022 INC:
  - -PHQ9 SCORE PRE-; MID; POST-
  - -PCL5 SCORE PRE-; MID; POST-
  - -N AND DURATION OF SESSIONS FOR THE INTERVENTION IN QUESTION
  - -DEMOGRAPHIC DATA (GENDER, AGE, ETHNICITY)
- ANCOVA FOR STATISTICAL ANALYSIS IN SPSS
- CONTROL FOR PCL5, TRAJECTORY OF SCORES MID-WAY, CONSIDER BASELINE LEVELS
- NHS APPROVAL HAS BEEN OBTAINED FOR THE SERVICE EVALUATION FROM THE HEAD OF IMPROVEMENT, HEAD OF INFORMATION GOVERNANCE AND PROFESSIONAL LEAD

# DRAFT TIMETABLE OF THE WORK

| Date | Task |
|---|---|
| January 2023 | Submit RD1 to the supervision team. V |
| February 2023 | Submit RD1 to UWE PGR panel. V |
| June-July 2023 | Submit Ethics Application. V<br>Complete risk assessment, data management plan, and collaboration contract. V |
| August 2023 | Draft Literature review chapter and submit to the supervision team. V |
| October-November 2023 | Draft Progression Report and submit to the supervision team. |
| December 2023 - February 2024 | Data Collection: Manually extract data from the electronic database. |
| March 2024 | Progression Viva. |
| April 2024 – September 2024 | Data Analysis.<br>Draft Thesis and journal article. |
| October 2024 – December 2024 | Submit Draft Thesis and journal article to the supervision team.<br>Progress Review stage 2/3. Submit Thesis to UWE. |
| January 2025 | Final Viva. |

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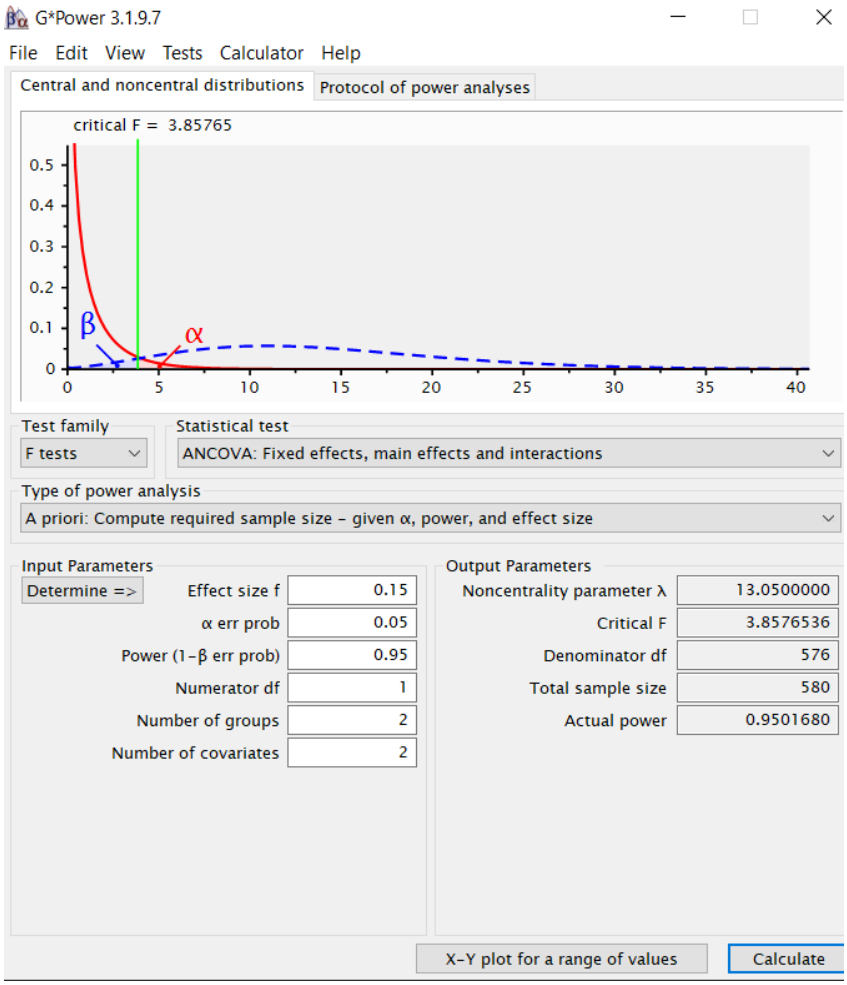
# THANK YOU FOR LISTENING


Any feedback or questions?

## Appendix 8. A priori statistical power calculation



## Appendix 9. Draft Journal Article

**This page has been removed due to containing personal and private information.**

## Appendix 10. SPSS Output

## Descriptive Statistics

[DataSet1] C:\Users\Marina.Ulanova\OneDrive - Solent NHS Trust\Desktop\RESEARCH DATA\spss data 18052024.sav

### Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| PHQ-9 pre- | 581 | 2 | 27 | 17.56 | 5.040 |
| PHQ-9 post- | 581 | 0 | 26 | 7.31 | 5.059 |
| PCL-5 pre- | 581 | 7 | 80 | 51.81 | 13.459 |
| PCL-5 post- | 581 | 0 | 79 | 23.95 | 15.385 |
| N sessions | 581 | 2 | 43 | 11.90 | 5.050 |
| N of therapy minutes | 581 | 120 | 2040 | 713.35 | 298.221 |
| Valid N (listwise) | 581 | | | | |

### Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| PHQ-9 pre- | 581 | 2 | 27 | 17.56 | 5.040 |
| PHQ-9 post- | 578 | 0 | 24 | 7.22 | 4.902 |
| PCL-5 pre- | 580 | 12 | 80 | 51.88 | 13.341 |
| PCL-5 post- | 576 | 0 | 70 | 23.52 | 14.728 |
| N sessions | 574 | 2 | 27 | 11.66 | 4.540 |
| N of therapy minutes | 573 | 120 | 1560 | 698.08 | 270.106 |
| Valid N (listwise) | 564 | | | | |

## Frequencies

[DataSet1] C:\Users\Marina.Ulanova\OneDrive - Solent NHS Trust\Desktop\RESEARCH DATA\spss data 18052024.sav

### Statistics

| | | PHQ-9 pre- | PHQ-9 post- | PCL-5 pre- | PCL-5 post- | Intervention type | N sessions |
|---|---|---|---|---|---|---|---|
| N | Valid | 581 | 578 | 580 | 576 | 581 | 574 |
| | Missing | 0 | 3 | 1 | 5 | 0 | 7 |

### Statistics

| | | N of therapy minutes | Age at the start of therapy | Gender | Ethnicity |
|---|---|---|---|---|---|
| N | Valid | 573 | 581 | 581 | 581 |
| | Missing | 8 | 0 | 0 | 0 |

## Frequency Table

**Intervention type**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | CBT | 374 | 64.4 | 64.4 | 64.4 |
| | EMDR | 207 | 35.6 | 35.6 | 100.0 |
| | Total | 581 | 100.0 | 100.0 | |

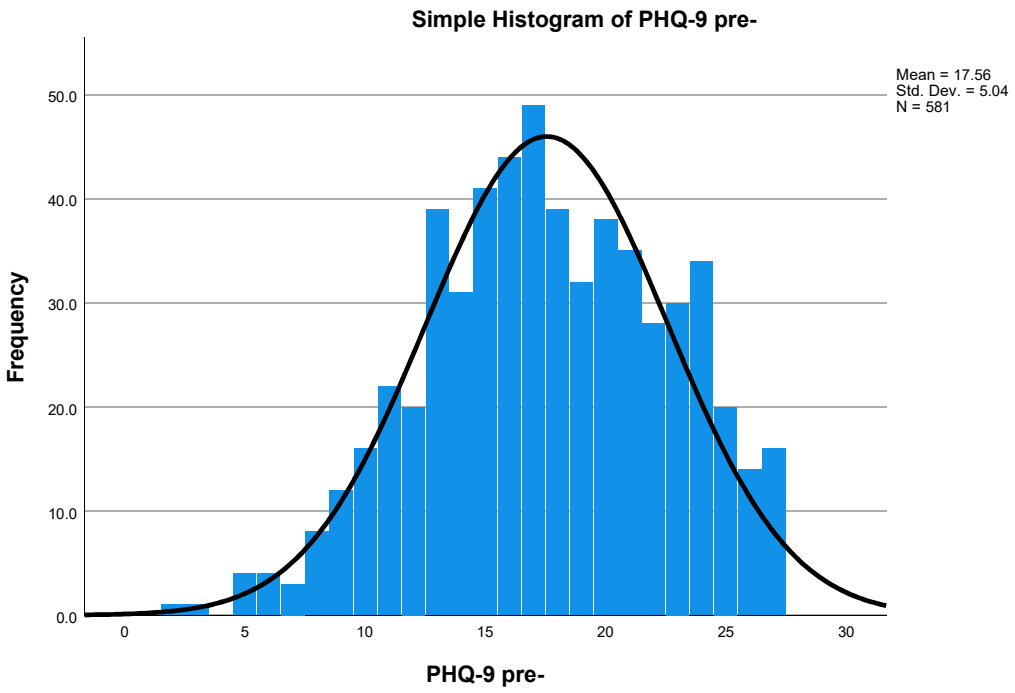
**Gender**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | male | 148 | 25.5 | 25.5 | 25.5 |
| | female | 425 | 73.1 | 73.1 | 98.6 |
| | other | 8 | 1.4 | 1.4 | 100.0 |
| | Total | 581 | 100.0 | 100.0 | |

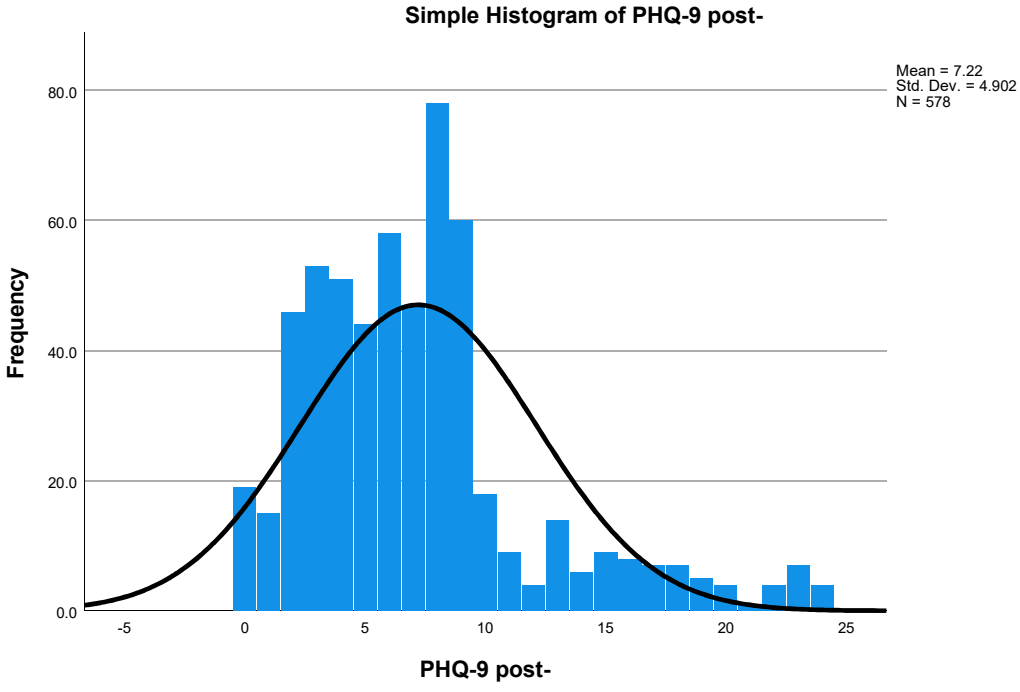
**Ethnicity**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | white british | 470 | 80.9 | 80.9 | 80.9 |
| | white other | 43 | 7.4 | 7.4 | 88.3 |
| | mixed | 14 | 2.4 | 2.4 | 90.7 |
| | white irish | 2 | .3 | .3 | 91.0 |
| | arab | 12 | 2.1 | 2.1 | 93.1 |
| | asian other | 11 | 1.9 | 1.9 | 95.0 |
| | black other | 4 | .7 | .7 | 95.7 |
| | other | 2 | .3 | .3 | 96.0 |
| | black carribean | 2 | .3 | .3 | 96.4 |
| | black african | 6 | 1.0 | 1.0 | 97.4 |
| | asian indian | 7 | 1.2 | 1.2 | 98.6 |
| | asian bangladeshi | 8 | 1.4 | 1.4 | 100.0 |
| | Total | 581 | 100.0 | 100.0 | |

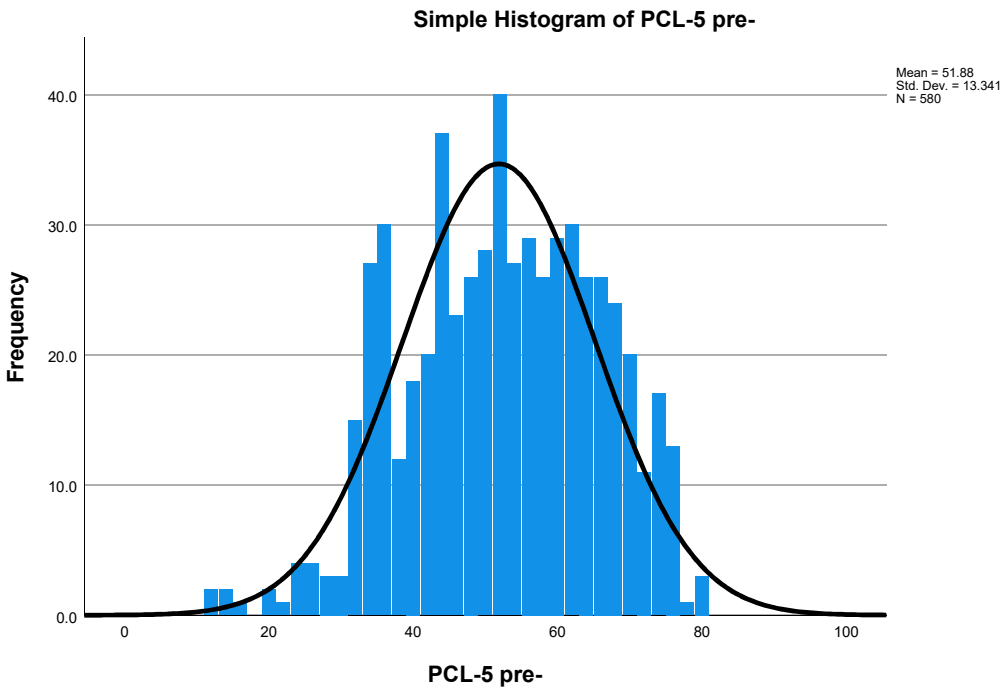
**Histogram of pre-PHQ-9**



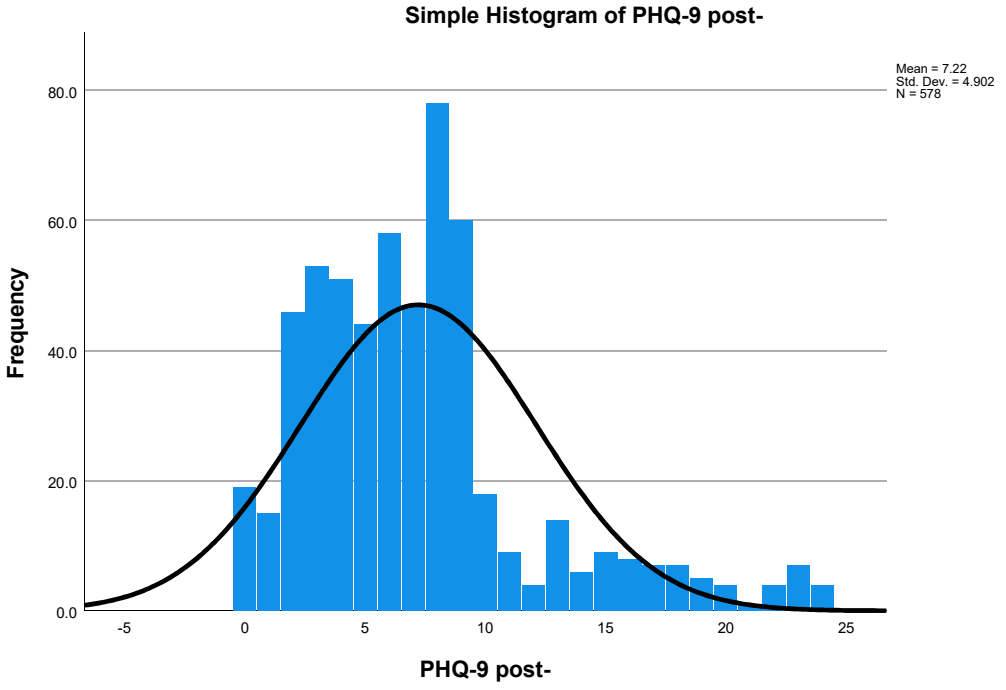

## Histogram of post-PHQ-9



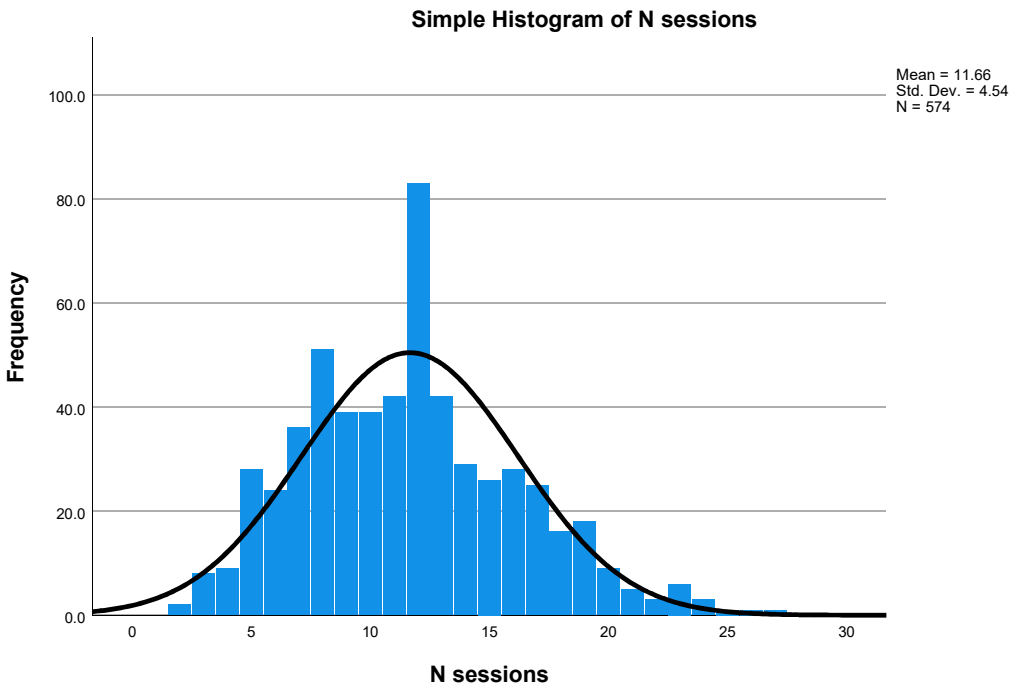

## Histogram of pre-PCL-5



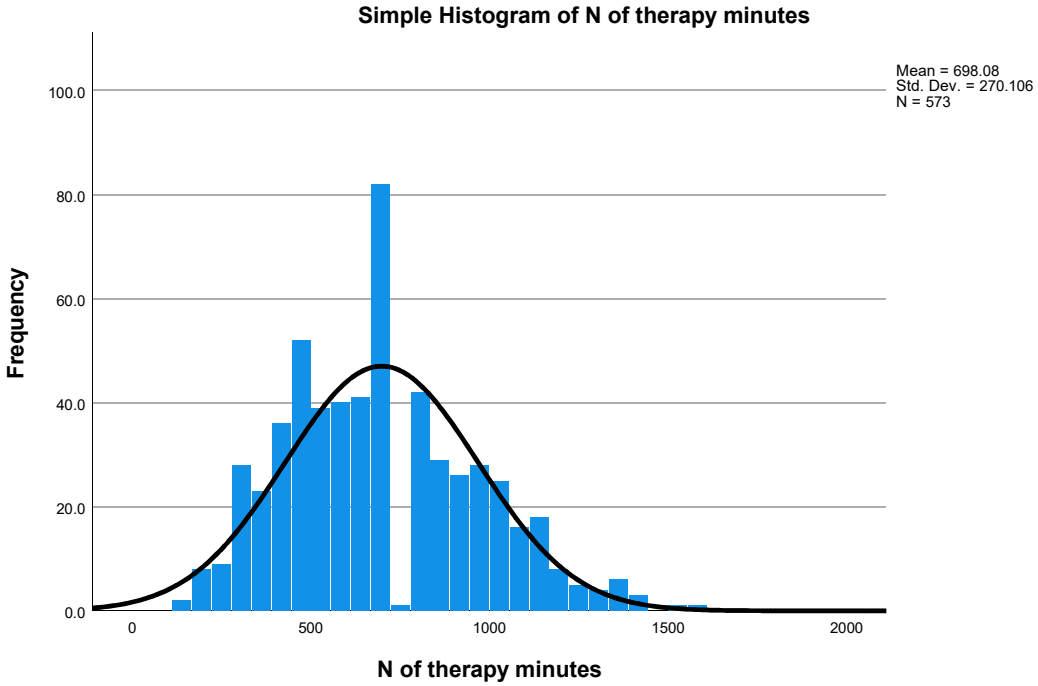

## Histogram of post-PCL-5



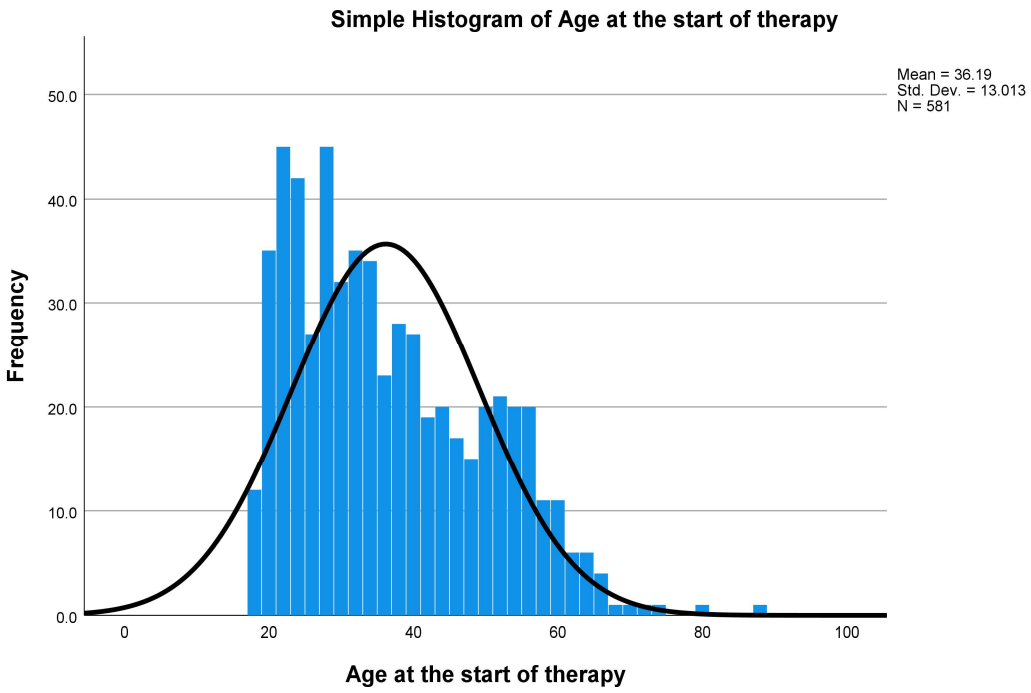

## Histogram of N of sessions



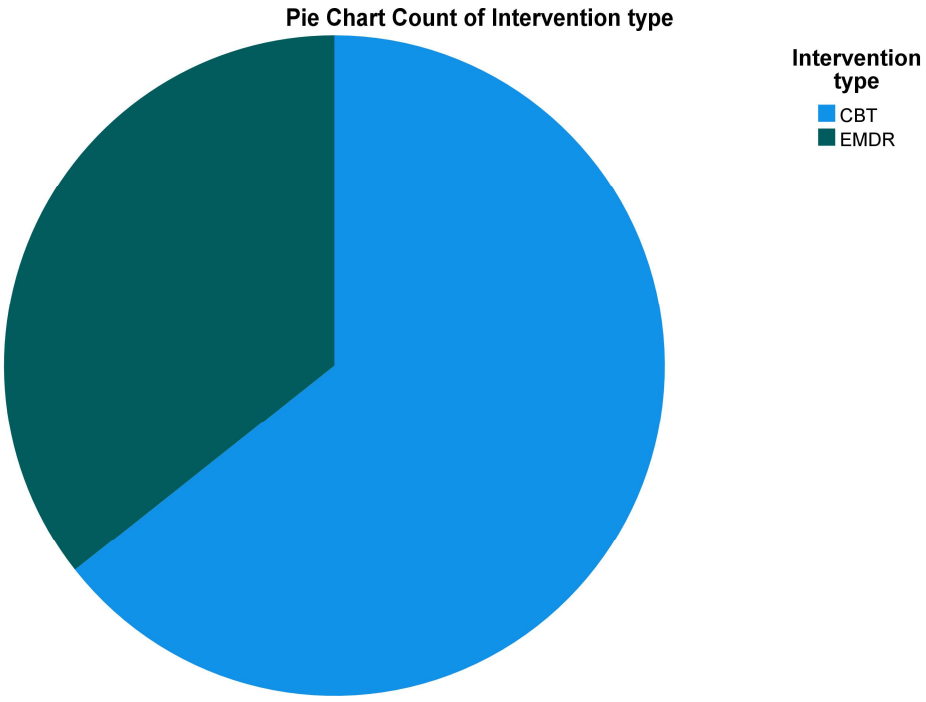

## Histogram of N of minutes



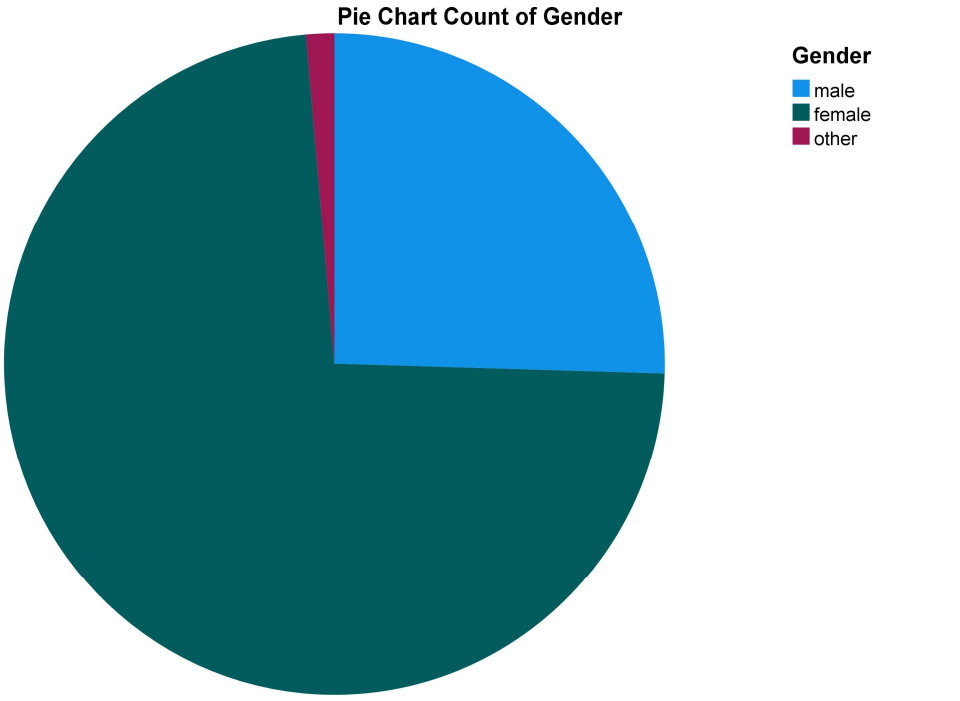

## Histogram of age



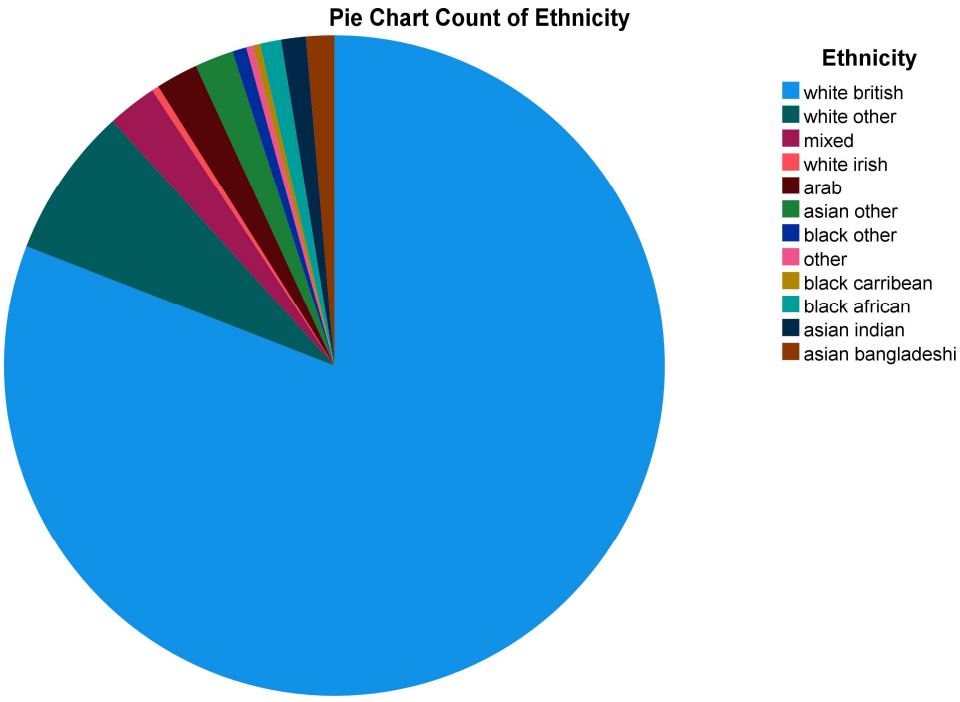

## Pie chart of intervention type




## Pie chart of gender




**Pie chart of ethnicity**




**T-Test of PHQ-9 pre - CBT vs EMDR**

## Group Statistics

| | Intervention type | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| PHQ-9 pre- | CBT | 374 | 16.69 | 5.116 | .265 |
| | EMDR | 207 | 19.12 | 4.507 | .313 |

## Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | |
|---|---|---|---|---|---|
| | | F | Sig. | t | df |
| PHQ-9 pre- | Equal variances assumed | 3.088 | .079 | -5.718 | 579 |
| | Equal variances not assumed | | | -5.929 | 472.020 |

## Independent Samples Test

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | Significance | | |
| | | One-Sided p | Two-Sided p | Mean Difference |
| PHQ-9 pre- | Equal variances assumed | <.001 | <.001 | -2.431 |
| | Equal variances not assumed | <.001 | <.001 | -2.431 |

## Independent Samples Test

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | Lower | Upper |
| PHQ-9 pre- | Equal variances assumed | .425 | -3.266 | -1.596 |
| | Equal variances not assumed | .410 | -3.237 | -1.625 |

## Independent Samples Effect Sizes

| | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | Standardizer[a] | Point Estimate | Lower | Upper |
| PHQ-9 pre- | Cohen's d | 4.908 | -.495 | -.667 | -.323 |
| | Hedges' correction | 4.914 | -.495 | -.666 | -.323 |
| | Glass's delta | 4.507 | -.539 | -.716 | -.361 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

## T-Test of PCL-5 pre - CBT vs EMDR

### Group Statistics

| | Intervention type | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| PCL-5 pre- | CBT | 373 | 51.43 | 13.916 | .721 |
| | EMDR | 207 | 52.71 | 12.225 | .850 |

### Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | |
|---|---|---|---|---|---|
| | | F | Sig. | t | df |
| PCL-5 pre- | Equal variances assumed | 5.220 | .023 | -1.111 | 578 |
| | Equal variances not assumed | | | -1.152 | 473.255 |

### Independent Samples Test

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | Significance | | |
| | | One-Sided p | Two-Sided p | Mean Difference |
| PCL-5 pre- | Equal variances assumed | .134 | .267 | -1.284 |
| | Equal variances not assumed | .125 | .250 | -1.284 |

### Independent Samples Test

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | | 95% Confidence Interval of the Difference | |
| | | Std. Error Difference | Lower | Upper |
| PCL-5 pre- | Equal variances assumed | 1.156 | -3.554 | .987 |
| | Equal variances not assumed | 1.114 | -3.473 | .905 |

### Independent Samples Effect Sizes

| | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | Standardizer[a] | Point Estimate | Lower | Upper |
| PCL-5 pre- | Cohen's d | 13.338 | -.096 | -.266 | .074 |
| | Hedges' correction | 13.355 | -.096 | -.266 | .074 |
| | Glass's delta | 12.225 | -.105 | -.275 | .065 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

## Testing the assumption of homogeneity

[DataSet1]

### Within-Subjects Factors

Measure: MEASURE_1

| depression | Dependent Variable |
|---|---|
| 1 | PHQ9pre |
| 2 | PHQ9post |

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Intervention type | 1 | CBT | 372 |
| | 2 | EMDR | 205 |

### Multivariate Tests[a]

| Effect | | Value | F | Hypothesis df | Error df |
|---|---|---|---|---|---|
| depression | Pillai's Trace | .094 | 59.713[b] | 1.000 | 573.000 |
| | Wilks' Lambda | .906 | 59.713[b] | 1.000 | 573.000 |
| | Hotelling's Trace | .104 | 59.713[b] | 1.000 | 573.000 |
| | Roy's Largest Root | .104 | 59.713[b] | 1.000 | 573.000 |
| depression * Interventiontype | Pillai's Trace | .003 | 1.504[b] | 1.000 | 573.000 |
| | Wilks' Lambda | .997 | 1.504[b] | 1.000 | 573.000 |
| | Hotelling's Trace | .003 | 1.504[b] | 1.000 | 573.000 |
| | Roy's Largest Root | .003 | 1.504[b] | 1.000 | 573.000 |
| depression * PCL5pre | Pillai's Trace | .020 | 11.457[b] | 1.000 | 573.000 |
| | Wilks' Lambda | .980 | 11.457[b] | 1.000 | 573.000 |
| | Hotelling's Trace | .020 | 11.457[b] | 1.000 | 573.000 |
| | Roy's Largest Root | .020 | 11.457[b] | 1.000 | 573.000 |
| depression * Interventiontype * PCL5pre | Pillai's Trace | .001 | .516[b] | 1.000 | 573.000 |
| | Wilks' Lambda | .999 | .516[b] | 1.000 | 573.000 |
| | Hotelling's Trace | .001 | .516[b] | 1.000 | 573.000 |
| | Roy's Largest Root | .001 | .516[b] | 1.000 | 573.000 |

## Multivariate Tests[a]

| Effect | | Sig. |
|---|---|---|
| depression | Pillai's Trace | <.001 |
| | Wilks' Lambda | <.001 |
| | Hotelling's Trace | <.001 |
| | Roy's Largest Root | <.001 |
| depression * Interventiontype | Pillai's Trace | .221 |
| | Wilks' Lambda | .221 |
| | Hotelling's Trace | .221 |
| | Roy's Largest Root | .221 |
| depression * PCL5pre | Pillai's Trace | <.001 |
| | Wilks' Lambda | <.001 |
| | Hotelling's Trace | <.001 |
| | Roy's Largest Root | <.001 |
| depression * Interventiontype * PCL5pre | Pillai's Trace | .473 |
| | Wilks' Lambda | .473 |
| | Hotelling's Trace | .473 |
| | Roy's Largest Root | .473 |

a. Design: Intercept + Interventiontype + PCL5pre + Interventiontype * PCL5pre
Within Subjects Design: depression

b. Exact statistic

## Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

| Within Subjects Effect | Mauchly's W | Approx. Chi-Square | df | Sig. | Epsilon[b] Greenhouse-Geisser |
|---|---|---|---|---|---|
| depression | 1.000 | .000 | 0 | . | 1.000 |

## Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

| | Epsilon[b] | |
|---|---|---|
| Within Subjects Effect | Huynh-Feldt | Lower-bound |
| depression | 1.000 | 1.000 |

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Interventiontype + PCL5pre + Interventiontype * PCL5pre
Within Subjects Design: depression

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

## Tests of Within-Subjects Effects

Measure: MEASURE_1

| Source | | Type III Sum of Squares | df | Mean Square |
|---|---|---|---|---|
| depression | Sphericity Assumed | 845.658 | 1 | 845.658 |
| | Greenhouse-Geisser | 845.658 | 1.000 | 845.658 |
| | Huynh-Feldt | 845.658 | 1.000 | 845.658 |
| | Lower-bound | 845.658 | 1.000 | 845.658 |
| depression * Interventiontype | Sphericity Assumed | 21.293 | 1 | 21.293 |
| | Greenhouse-Geisser | 21.293 | 1.000 | 21.293 |
| | Huynh-Feldt | 21.293 | 1.000 | 21.293 |
| | Lower-bound | 21.293 | 1.000 | 21.293 |
| depression * PCL5pre | Sphericity Assumed | 162.251 | 1 | 162.251 |
| | Greenhouse-Geisser | 162.251 | 1.000 | 162.251 |
| | Huynh-Feldt | 162.251 | 1.000 | 162.251 |
| | Lower-bound | 162.251 | 1.000 | 162.251 |
| depression * Interventiontype * PCL5pre | Sphericity Assumed | 7.308 | 1 | 7.308 |
| | Greenhouse-Geisser | 7.308 | 1.000 | 7.308 |
| | Huynh-Feldt | 7.308 | 1.000 | 7.308 |
| | Lower-bound | 7.308 | 1.000 | 7.308 |
| Error(depression) | Sphericity Assumed | 8114.828 | 573 | 14.162 |
| | Greenhouse-Geisser | 8114.828 | 573.000 | 14.162 |
| | Huynh-Feldt | 8114.828 | 573.000 | 14.162 |
| | Lower-bound | 8114.828 | 573.000 | 14.162 |

## Tests of Within-Subjects Effects

Measure: MEASURE_1

| Source | | F | Sig. |
|---|---|---|---|
| depression | Sphericity Assumed | 59.713 | <.001 |
| | Greenhouse-Geisser | 59.713 | <.001 |
| | Huynh-Feldt | 59.713 | <.001 |
| | Lower-bound | 59.713 | <.001 |
| depression * Interventiontype | Sphericity Assumed | 1.504 | .221 |
| | Greenhouse-Geisser | 1.504 | .221 |
| | Huynh-Feldt | 1.504 | .221 |
| | Lower-bound | 1.504 | .221 |
| depression * PCL5pre | Sphericity Assumed | 11.457 | <.001 |
| | Greenhouse-Geisser | 11.457 | <.001 |
| | Huynh-Feldt | 11.457 | <.001 |
| | Lower-bound | 11.457 | <.001 |
| depression * Interventiontype * PCL5pre | Sphericity Assumed | .516 | .473 |
| | Greenhouse-Geisser | .516 | .473 |
| | Huynh-Feldt | .516 | .473 |
| | Lower-bound | .516 | .473 |
| Error(depression) | Sphericity Assumed | | |
| | Greenhouse-Geisser | | |
| | Huynh-Feldt | | |
| | Lower-bound | | |

## Tests of Within-Subjects Contrasts

Measure: MEASURE_1

| Source | depression | Type III Sum of Squares | df | Mean Square | F |
|---|---|---|---|---|---|
| depression | Linear | 845.658 | 1 | 845.658 | 59.713 |
| depression * Interventiontype | Linear | 21.293 | 1 | 21.293 | 1.504 |
| depression * PCL5pre | Linear | 162.251 | 1 | 162.251 | 11.457 |
| depression * Interventiontype * PCL5pre | Linear | 7.308 | 1 | 7.308 | .516 |
| Error(depression) | Linear | 8114.828 | 573 | 14.162 | |

## Tests of Within-Subjects Contrasts

Measure: MEASURE_1

| Source | depression | Sig. |
|---|---|---|
| depression | Linear | <.001 |
| depression * Interventiontype | Linear | .221 |
| depression * PCL5pre | Linear | <.001 |
| depression * Interventiontype * PCL5pre | Linear | .473 |
| Error(depression) | Linear | |

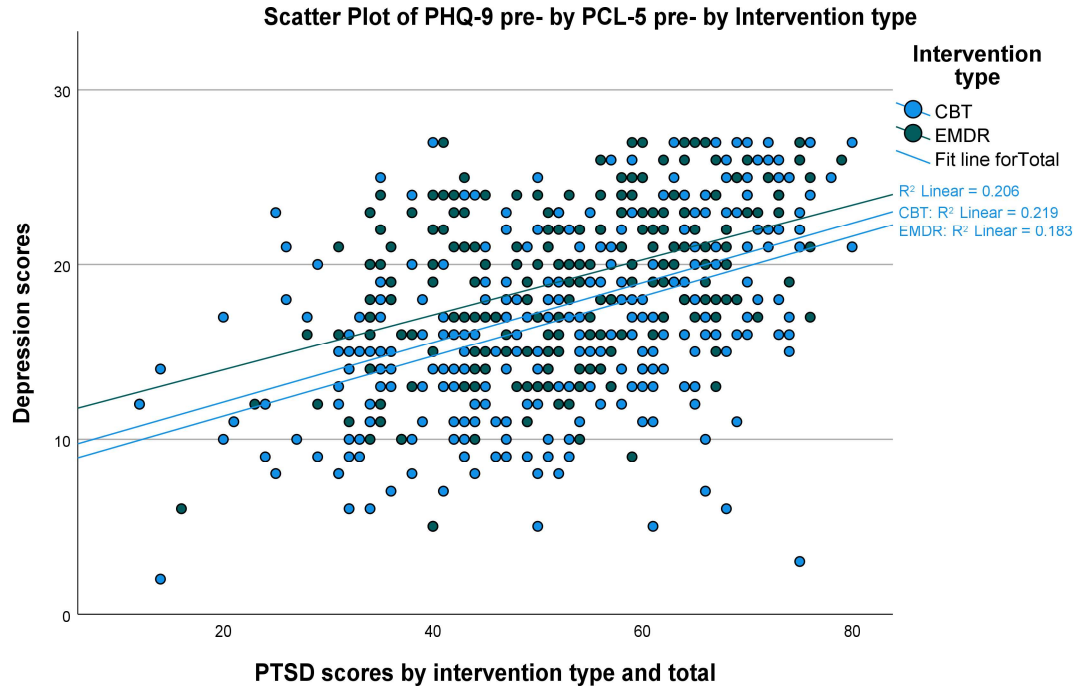
## Tests of Between-Subjects Effects

Measure: MEASURE_1

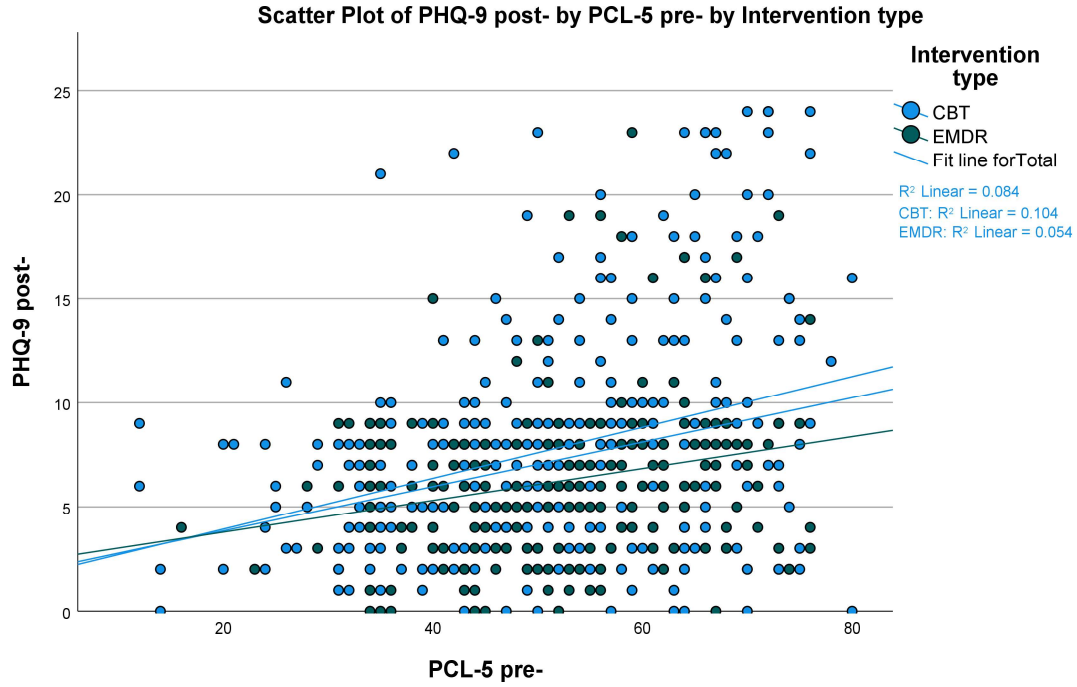
Transformed Variable: Average

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Intercept | 1876.066 | 1 | 1876.066 | 71.298 | <.001 |
| Interventiontype | 56.999 | 1 | 56.999 | 2.166 | .142 |
| PCL5pre | 2856.170 | 1 | 2856.170 | 108.546 | <.001 |
| Interventiontype * PCL5pre | 44.465 | 1 | 44.465 | 1.690 | .194 |
| Error | 15077.343 | 573 | 26.313 | | |

## Scatterplot - Testing the assumption of homogeneity



## GGraph


Scatter Plot of PHQ-9 post- by PCL-5 pre- by Intervention type
Intervention type
CBT
EMDR
Fit line forTotal
R² Linear = 0.084
CBT: R² Linear = 0.104
EMDR: R² Linear = 0.054
PHQ-9 post-
PCL-5 pre-
0
5
10
15
20
25
20
40
60
80

**MAIN 2x2 Mixed ANCOVA - General Linear Model**

### Within-Subjects Factors

Measure: MEASURE_1

| time | Dependent Variable |
|---|---|
| 1 | PHQ9pre |
| 2 | PHQ9post |

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Intervention type | 1 | CBT | 372 |
| | 2 | EMDR | 205 |

### Descriptive Statistics

| | Intervention type | Mean | Std. Deviation | N |
|---|---|---|---|---|
| PHQ-9 pre- | CBT | 16.70 | 5.099 | 372 |
| | EMDR | 19.05 | 4.469 | 205 |
| | Total | 17.53 | 5.009 | 577 |
| PHQ-9 post- | CBT | 7.77 | 5.276 | 372 |
| | EMDR | 6.26 | 3.954 | 205 |
| | Total | 7.23 | 4.897 | 577 |

**Box's Test of Equality of Covariance Matrices[a]**

| | |
|---|---|
| Box's M | 23.027 |
| F | 7.643 |
| df1 | 3 |
| df2 | 5287549.816 |
| Sig. | <.001 |

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + PCL5pre + Interventiontype
Within Subjects Design: time

**Multivariate Tests[a]**

| Effect | | Value | F | Hypothesis df | Error df |
|---|---|---|---|---|---|
| time | Pillai's Trace | .119 | 77.789[b] | 1.000 | 574.000 |
| | Wilks' Lambda | .881 | 77.789[b] | 1.000 | 574.000 |
| | Hotelling's Trace | .136 | 77.789[b] | 1.000 | 574.000 |
| | Roy's Largest Root | .136 | 77.789[b] | 1.000 | 574.000 |
| time * PCL5pre | Pillai's Trace | .020 | 11.536[b] | 1.000 | 574.000 |
| | Wilks' Lambda | .980 | 11.536[b] | 1.000 | 574.000 |
| | Hotelling's Trace | .020 | 11.536[b] | 1.000 | 574.000 |
| | Roy's Largest Root | .020 | 11.536[b] | 1.000 | 574.000 |
| time * Interventiontype | Pillai's Trace | .105 | 67.176[b] | 1.000 | 574.000 |
| | Wilks' Lambda | .895 | 67.176[b] | 1.000 | 574.000 |
| | Hotelling's Trace | .117 | 67.176[b] | 1.000 | 574.000 |
| | Roy's Largest Root | .117 | 67.176[b] | 1.000 | 574.000 |

## Multivariate Tests[a]

| Effect | | Sig. | Partial Eta Squared |
|---|---|---|---|
| time | Pillai's Trace | <.001 | .119 |
| | Wilks' Lambda | <.001 | .119 |
| | Hotelling's Trace | <.001 | .119 |
| | Roy's Largest Root | <.001 | .119 |
| time * PCL5pre | Pillai's Trace | <.001 | .020 |
| | Wilks' Lambda | <.001 | .020 |
| | Hotelling's Trace | <.001 | .020 |
| | Roy's Largest Root | <.001 | .020 |
| time * Interventiontype | Pillai's Trace | <.001 | .105 |
| | Wilks' Lambda | <.001 | .105 |
| | Hotelling's Trace | <.001 | .105 |
| | Roy's Largest Root | <.001 | .105 |

a. Design: Intercept + PCL5pre + Interventiontype
Within Subjects Design: time

b. Exact statistic

## Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

| Within Subjects Effect | Mauchly's W | Approx. Chi-Square | df | Sig. | Epsilon[b] Greenhouse-Geisser |
|---|---|---|---|---|---|
| time | 1.000 | .000 | 0 | . | 1.000 |

## Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

| | Epsilon[b] | |
|---|---|---|
| Within Subjects Effect | Huynh-Feldt | Lower-bound |
| time | 1.000 | 1.000 |

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + PCL5pre + Interventiontype
Within Subjects Design: time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

## Tests of Within-Subjects Effects

Measure: MEASURE_1

| Source | | Type III Sum of Squares | df | Mean Square | F |
|---|---|---|---|---|---|
| time | Sphericity Assumed | 1100.721 | 1 | 1100.721 | 77.789 |
| | Greenhouse-Geisser | 1100.721 | 1.000 | 1100.721 | 77.789 |
| | Huynh-Feldt | 1100.721 | 1.000 | 1100.721 | 77.789 |
| | Lower-bound | 1100.721 | 1.000 | 1100.721 | 77.789 |
| time * PCL5pre | Sphericity Assumed | 163.234 | 1 | 163.234 | 11.536 |
| | Greenhouse-Geisser | 163.234 | 1.000 | 163.234 | 11.536 |
| | Huynh-Feldt | 163.234 | 1.000 | 163.234 | 11.536 |
| | Lower-bound | 163.234 | 1.000 | 163.234 | 11.536 |
| time * Interventiontype | Sphericity Assumed | 950.539 | 1 | 950.539 | 67.176 |
| | Greenhouse-Geisser | 950.539 | 1.000 | 950.539 | 67.176 |
| | Huynh-Feldt | 950.539 | 1.000 | 950.539 | 67.176 |
| | Lower-bound | 950.539 | 1.000 | 950.539 | 67.176 |
| Error(time) | Sphericity Assumed | 8122.135 | 574 | 14.150 | |
| | Greenhouse-Geisser | 8122.135 | 574.000 | 14.150 | |
| | Huynh-Feldt | 8122.135 | 574.000 | 14.150 | |
| | Lower-bound | 8122.135 | 574.000 | 14.150 | |

## Tests of Within-Subjects Effects

Measure: MEASURE_1

| Source | | Sig. | Partial Eta Squared |
|---|---|---|---|
| time | Sphericity Assumed | <.001 | .119 |
| | Greenhouse-Geisser | <.001 | .119 |
| | Huynh-Feldt | <.001 | .119 |
| | Lower-bound | <.001 | .119 |
| time * PCL5pre | Sphericity Assumed | <.001 | .020 |
| | Greenhouse-Geisser | <.001 | .020 |
| | Huynh-Feldt | <.001 | .020 |
| | Lower-bound | <.001 | .020 |
| time * Interventiontype | Sphericity Assumed | <.001 | .105 |
| | Greenhouse-Geisser | <.001 | .105 |
| | Huynh-Feldt | <.001 | .105 |
| | Lower-bound | <.001 | .105 |
| Error(time) | Sphericity Assumed | | |
| | Greenhouse-Geisser | | |
| | Huynh-Feldt | | |
| | Lower-bound | | |

### Tests of Within-Subjects Contrasts

Measure: MEASURE_1

| Source | time | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| time | Linear | 1100.721 | 1 | 1100.721 | 77.789 | <.001 |
| time * PCL5pre | Linear | 163.234 | 1 | 163.234 | 11.536 | <.001 |
| time * Interventiontype | Linear | 950.539 | 1 | 950.539 | 67.176 | <.001 |
| Error(time) | Linear | 8122.135 | 574 | 14.150 | | |

### Tests of Within-Subjects Contrasts

Measure: MEASURE_1

| Source | time | Partial Eta Squared |
|---|---|---|
| time | Linear | .119 |
| time * PCL5pre | Linear | .020 |
| time * Interventiontype | Linear | .105 |
| Error(time) | Linear | |

### Levene's Test of Equality of Error Variances[a]

| | F | df1 | df2 | Sig. |
|---|---|---|---|---|
| PHQ-9 pre- | 1.442 | 1 | 575 | .230 |
| PHQ-9 post- | 11.251 | 1 | 575 | <.001 |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + PCL5pre + Interventiontype
Within Subjects Design: time

### Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Intercept | 1984.788 | 1 | 1984.788 | 75.339 | <.001 | .116 |
| PCL5pre | 3829.438 | 1 | 3829.438 | 145.359 | <.001 | .202 |
| Interventiontype | 20.677 | 1 | 20.677 | .785 | .376 | .001 |
| Error | 15121.808 | 574 | 26.345 | | | |

## Estimated Marginal Means

### 1. Intervention type

### Estimates

Measure: MEASURE_1

| Intervention type | Mean | Std. Error | 95% Confidence Interval | |
|---|---|---|---|---|
| | | | Lower Bound | Upper Bound |
| CBT | 12.283[a] | .188 | 11.913 | 12.652 |
| EMDR | 12.563[a] | .254 | 12.064 | 13.061 |

a. Covariates appearing in the model are evaluated at the following values: PCL-5 pre- = 51.79.

### Pairwise Comparisons

Measure: MEASURE_1

| (I) Intervention type | (J) Intervention type | Mean Difference (I-J) | Std. Error | Sig.[a] | 95% Confidence Interval for [a]... |
|---|---|---|---|---|---|
| | | | | | Lower Bound |
| CBT | EMDR | -.280 | .316 | .376 | -.900 |
| EMDR | CBT | .280 | .316 | .376 | -.341 |

### Pairwise Comparisons

Measure: MEASURE_1

| (I) Intervention type | (J) Intervention type | 95% Confidence Interval for [a]... |
|---|---|---|
| | | Upper Bound |
| CBT | EMDR | .341 |
| EMDR | CBT | .900 |

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests

Measure: MEASURE_1

| | Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Contrast | 10.339 | 1 | 10.339 | .785 | .376 | .001 |
| Error | 7560.904 | 574 | 13.172 | | | |

The F tests the effect of Intervention type. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

**2. time**

### Estimates

Measure: MEASURE_1

| time | Mean | Std. Error | 95% Confidence Interval Lower Bound | 95% Confidence Interval Upper Bound |
|---|---|---|---|---|
| 1 | 17.847[a] | .190 | 17.474 | 18.220 |
| 2 | 6.998[a] | .201 | 6.602 | 7.394 |

a. Covariates appearing in the model are evaluated at the following values: PCL-5 pre- = 51.79.

### Pairwise Comparisons

Measure: MEASURE_1

| (I) time | (J) time | Mean Difference (I-J) | Std. Error | Sig.[b] | 95% Confidence Interval for Difference[b] Lower Bound | 95% Confidence Interval for Difference[b] Upper Bound |
|---|---|---|---|---|---|---|
| 1 | 2 | 10.849* | .231 | <.001 | 10.395 | 11.304 |
| 2 | 1 | -10.849* | .231 | <.001 | -11.304 | -10.395 |

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

### Multivariate Tests

| | Value | F | Hypothesis df | Error df | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Pillai's trace | .793 | 2198.492[a] | 1.000 | 574.000 | <.001 | .793 |
| Wilks' lambda | .207 | 2198.492[a] | 1.000 | 574.000 | <.001 | .793 |
| Hotelling's trace | 3.830 | 2198.492[a] | 1.000 | 574.000 | <.001 | .793 |
| Roy's largest root | 3.830 | 2198.492[a] | 1.000 | 574.000 | <.001 | .793 |

Each F tests the multivariate effect of time. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

## 3. Intervention type * time

### Estimates

Measure: MEASURE_1

| Intervention type | time | Mean | Std. Error | 95% Confidence Interval Lower Bound | 95% Confidence Interval Upper Bound |
|---|---|---|---|---|---|
| CBT | 1 | 16.758[a] | .226 | 16.314 | 17.203 |
| | 2 | 7.807[a] | .240 | 7.335 | 8.279 |
| EMDR | 1 | 18.936[a] | .305 | 18.337 | 19.535 |
| | 2 | 6.189[a] | .324 | 5.554 | 6.825 |

a. Covariates appearing in the model are evaluated at the following values: PCL-5 pre- = 51.79.

### Pairwise Comparisons

Measure: MEASURE_1

| time | (I) Intervention type | (J) Intervention type | Mean Difference (I-J) | Std. Error | Sig.[b] |
|---|---|---|---|---|---|
| 1 | CBT | EMDR | -2.178* | .380 | <.001 |
| | EMDR | CBT | 2.178* | .380 | <.001 |
| 2 | CBT | EMDR | 1.618* | .403 | <.001 |
| | EMDR | CBT | -1.618* | .403 | <.001 |

### Pairwise Comparisons

Measure: MEASURE_1

| | | | 95% Confidence Interval for Difference[b] | |
|---|---|---|---|---|
| time | (I) Intervention type | (J) Intervention type | Lower Bound | Upper Bound |
| 1 | CBT | EMDR | -2.924 | -1.431 |
| | EMDR | CBT | 1.431 | 2.924 |
| 2 | CBT | EMDR | .826 | 2.410 |
| | EMDR | CBT | -2.410 | -.826 |

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests

Measure: MEASURE_1

| time | | Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|---|
| 1 | Contrast | 625.802 | 1 | 625.802 | 32.855 | <.001 | .054 |
| | Error | 10933.221 | 574 | 19.047 | | | |
| 2 | Contrast | 345.414 | 1 | 345.414 | 16.105 | <.001 | .027 |
| | Error | 12310.722 | 574 | 21.447 | | | |

Each F tests the simple effects of Intervention type within each level combination of the other effects shown. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

## 4. Intervention type * time

## Estimates

Measure: MEASURE_1

| Intervention type | time | Mean | Std. Error | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower Bound | Upper Bound |
| CBT | 1 | 16.758[a] | .226 | 16.314 | 17.203 |
| | 2 | 7.807[a] | .240 | 7.335 | 8.279 |
| EMDR | 1 | 18.936[a] | .305 | 18.337 | 19.535 |
| | 2 | 6.189[a] | .324 | 5.554 | 6.825 |

a. Covariates appearing in the model are evaluated at the following values: PCL-5 pre- = 51.79.

## Pairwise Comparisons

Measure: MEASURE_1

| Intervention type | (I) time | (J) time | Mean Difference (I-J) | Std. Error | Sig.[b] | 95% Confidence Interval for [b]... |
|---|---|---|---|---|---|---|
| | | | | | | Lower Bound |
| CBT | 1 | 2 | 8.951* | .276 | <.001 | 8.410 |
| | 2 | 1 | -8.951* | .276 | <.001 | -9.493 |
| EMDR | 1 | 2 | 12.747* | .372 | <.001 | 12.017 |
| | 2 | 1 | -12.747* | .372 | <.001 | -13.477 |

## Pairwise Comparisons

Measure: MEASURE_1

| Intervention type | (I) time | (J) time | 95% Confidence Interval for [b]... |
|---|---|---|---|
| | | | Upper Bound |
| CBT | 1 | 2 | 9.493 |
| | 2 | 1 | -8.410 |
| EMDR | 1 | 2 | 13.477 |
| | 2 | 1 | -12.017 |

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

**Multivariate Tests**

| Intervention type | | Value | F | Hypothesis df | Error df | Sig. |
|---|---|---|---|---|---|---|
| CBT | Pillai's trace | .647 | 1052.715[a] | 1.000 | 574.000 | <.001 |
| | Wilks' lambda | .353 | 1052.715[a] | 1.000 | 574.000 | <.001 |
| | Hotelling's trace | 1.834 | 1052.715[a] | 1.000 | 574.000 | <.001 |
| | Roy's largest root | 1.834 | 1052.715[a] | 1.000 | 574.000 | <.001 |
| EMDR | Pillai's trace | .672 | 1175.868[a] | 1.000 | 574.000 | <.001 |
| | Wilks' lambda | .328 | 1175.868[a] | 1.000 | 574.000 | <.001 |
| | Hotelling's trace | 2.049 | 1175.868[a] | 1.000 | 574.000 | <.001 |
| | Roy's largest root | 2.049 | 1175.868[a] | 1.000 | 574.000 | <.001 |

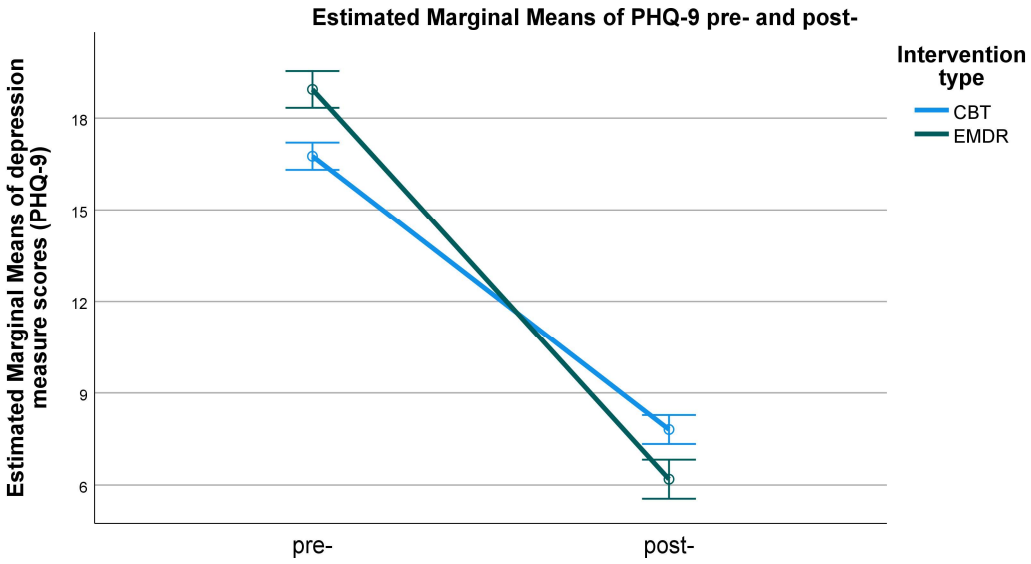
**Multivariate Tests**

| Intervention type | | Partial Eta Squared |
|---|---|---|
| CBT | Pillai's trace | .647 |
| | Wilks' lambda | .647 |
| | Hotelling's trace | .647 |
| | Roy's largest root | .647 |
| EMDR | Pillai's trace | .672 |
| | Wilks' lambda | .672 |
| | Hotelling's trace | .672 |
| | Roy's largest root | .672 |

Each F tests the multivariate simple effects of time within each level combination of the other effects shown. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

**Profile Plots**




Covariates appearing in the model are evaluated at the following values: PCL-5 pre- = 51.79

Error bars: 95% CI

## Correlations

**Correlations**

| | | PHQ-9 pre- | PHQ-9 post- |
|---|---|---|---|
| PHQ-9 pre- | Pearson Correlation | 1 | .347** |
| | Sig. (1-tailed) | | <.001 |
| | N | 581 | 578 |
| PHQ-9 post- | Pearson Correlation | .347** | 1 |
| | Sig. (1-tailed) | <.001 | |
| | N | 578 | 578 |

**. Correlation is significant at the 0.01 level (1-tailed).

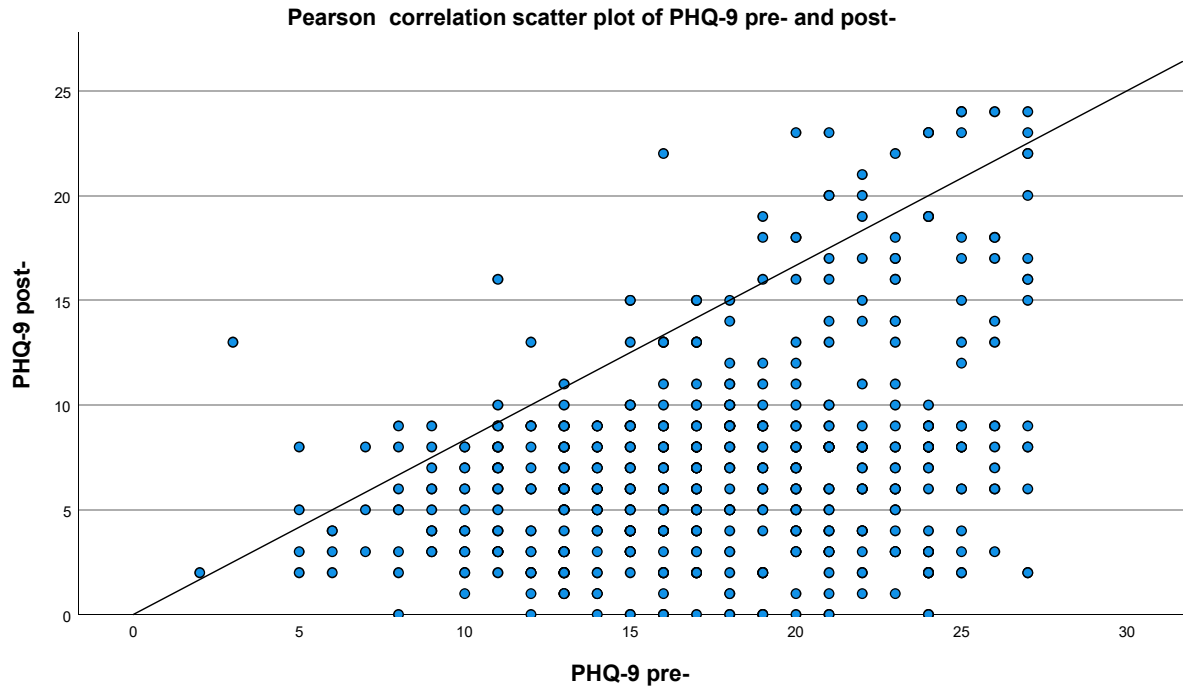
## Correlations

**Correlations**

| | | PHQ-9 pre- | PHQ-9 post- |
|---|---|---|---|
| PHQ-9 pre- | Pearson Correlation | 1 | .347** |
| | Sig. (2-tailed) | | <.001 |
| | N | 581 | 578 |
| PHQ-9 post- | Pearson Correlation | .347** | 1 |
| | Sig. (2-tailed) | <.001 | |
| | N | 578 | 578 |

**. Correlation is significant at the 0.01 level (2-tailed).

## Pearson's correlation scatterplot



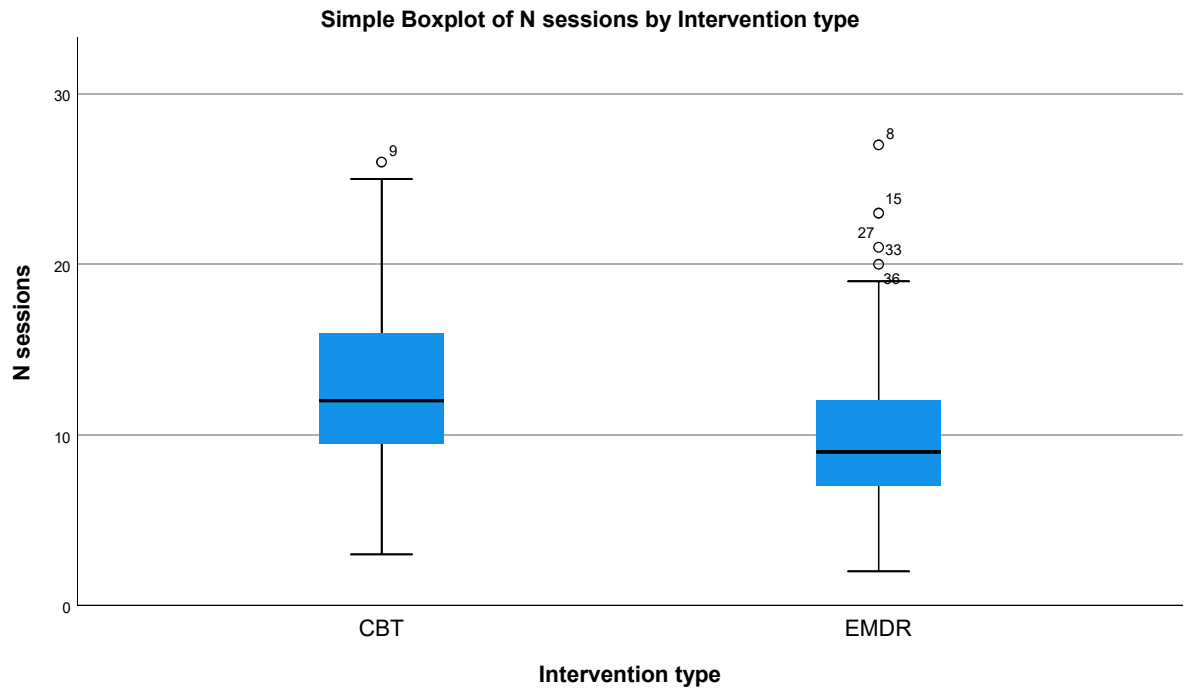

## Bootstrap

[DataSet1] C:\Users\Marina.Ulanova\OneDrive - Solent NHS Trust\Desktop\RESEARCH DATA\spss data w Z scores 9.6.2024.sav

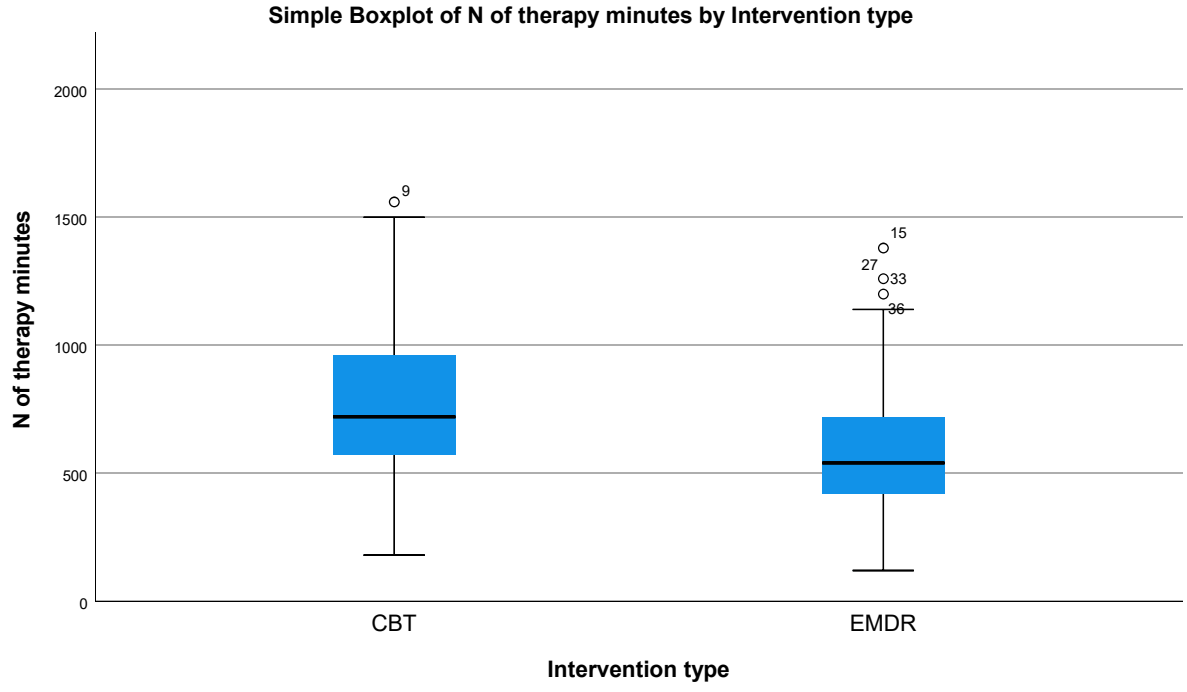
### Bootstrap Specifications

| | |
|---|---|
| Sampling Method | Simple |
| Number of Samples | 1000 |
| Confidence Interval Level | 95.0% |
| Confidence Interval Type | Percentile |

## Boxplot of N of sessions




## Boxplot of N of mins




## T-Test for N of sessins and mins

**Group Statistics**

| | Intervention type | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| N sessions | CBT | 367 | 12.64 | 4.470 | .233 |
| | EMDR | 207 | 9.91 | 4.129 | .287 |
| N of therapy minutes | CBT | 367 | 758.44 | 269.018 | 14.043 |
| | EMDR | 206 | 590.53 | 237.097 | 16.519 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of . |
|---|---|---|---|---|
| | | F | Sig. | t |
| N sessions | Equal variances assumed | 1.807 | .179 | 7.212 |
| | Equal variances not assumed | | | 7.373 |
| N of therapy minutes | Equal variances assumed | 3.114 | .078 | 7.475 |
| | Equal variances not assumed | | | 7.744 |

**Independent Samples Test**

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | | Significance | |
| | | df | One-Sided p | Two-Sided p |
| N sessions | Equal variances assumed | 572 | <.001 | <.001 |
| | Equal variances not assumed | 456.138 | <.001 | <.001 |
| N of therapy minutes | Equal variances assumed | 571 | <.001 | <.001 |
| | Equal variances not assumed | 470.664 | <.001 | <.001 |

**Independent Samples Test**

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | | | 95% Confidence Interval of the ... |
| | | Mean Difference | Std. Error Difference | Lower |
| N sessions | Equal variances assumed | 2.727 | .378 | 1.985 |
| | Equal variances not assumed | 2.727 | .370 | 2.000 |
| N of therapy minutes | Equal variances assumed | 167.910 | 22.462 | 123.792 |
| | Equal variances not assumed | 167.910 | 21.681 | 125.306 |

## Independent Samples Test

| | | t-test for Equality of Means: 95% Confidence Interval of the ... Upper |
|---|---|---|
| N sessions | Equal variances assumed | 3.470 |
| | Equal variances not assumed | 3.454 |
| N of therapy minutes | Equal variances assumed | 212.029 |
| | Equal variances not assumed | 210.514 |

## Independent Samples Effect Sizes

| | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | Standardizer[a] | Point Estimate | Lower | Upper |
| N sessions | Cohen's d | 4.350 | .627 | .452 | .801 |
| | Hedges' correction | 4.356 | .626 | .452 | .800 |
| | Glass's delta | 4.129 | .660 | .478 | .842 |
| N of therapy minutes | Cohen's d | 258.013 | .651 | .476 | .825 |
| | Hedges' correction | 258.352 | .650 | .475 | .824 |
| | Glass's delta | 237.097 | .708 | .524 | .891 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

## Homogeneity of pre-PTSD between groups assumption test

[DataSet1] C:\Users\Marina.Ulanova\OneDrive - Solent NHS Trust\Desktop\RESEARCH DATA\spss data w Z scores 9.6.2024.sav

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Intervention type | 1 | CBT | 373 |
| | 2 | EMDR | 207 |

### Tests of Between-Subjects Effects

Dependent Variable: PCL-5 pre-

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 219.429[a] | 1 | 219.429 | 1.233 | .267 |
| Intercept | 1443631.857 | 1 | 1443631.857 | 8114.879 | .000 |
| Interventiontype | 219.429 | 1 | 219.429 | 1.233 | .267 |
| Error | 102825.831 | 578 | 177.899 | | |
| Total | 1664405.000 | 580 | | | |
| Corrected Total | 103045.260 | 579 | | | |

a. R Squared = .002 (Adjusted R Squared = .000)

## Homogeneity of regression assumption test

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Intervention type | 1 | CBT | 368 |
| | 2 | EMDR | 207 |

### Tests of Between-Subjects Effects

Dependent Variable: PCL-5 post-

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 16537.048[a] | 3 | 5512.349 | 29.208 | <.001 |
| Intercept | 621.137 | 1 | 621.137 | 3.291 | .070 |
| Interventiontype | 27.008 | 1 | 27.008 | .143 | .705 |
| PCL5pre | 10667.296 | 1 | 10667.296 | 56.521 | <.001 |
| Interventiontype * PCL5pre | 89.476 | 1 | 89.476 | .474 | .491 |
| Error | 107764.976 | 571 | 188.730 | | |
| Total | 443328.000 | 575 | | | |
| Corrected Total | 124302.024 | 574 | | | |

a. R Squared = .133 (Adjusted R Squared = .128)

## ANCOVAPTSD

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Intervention type | 1 | CBT | 368 |
| | 2 | EMDR | 207 |

### Descriptive Statistics

Dependent Variable: PCL-5 post-

| Intervention type | Mean | Std. Deviation | N |
|---|---|---|---|
| CBT | 25.26 | 15.292 | 368 |
| EMDR | 20.53 | 13.131 | 207 |
| Total | 23.55 | 14.716 | 575 |

### Levene's Test of Equality of Error Variances[a]

Dependent Variable: PCL-5 post-

| F | df1 | df2 | Sig. |
|---|---|---|---|
| 3.237 | 1 | 573 | .073 |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + PCL5pre + Interventiontype

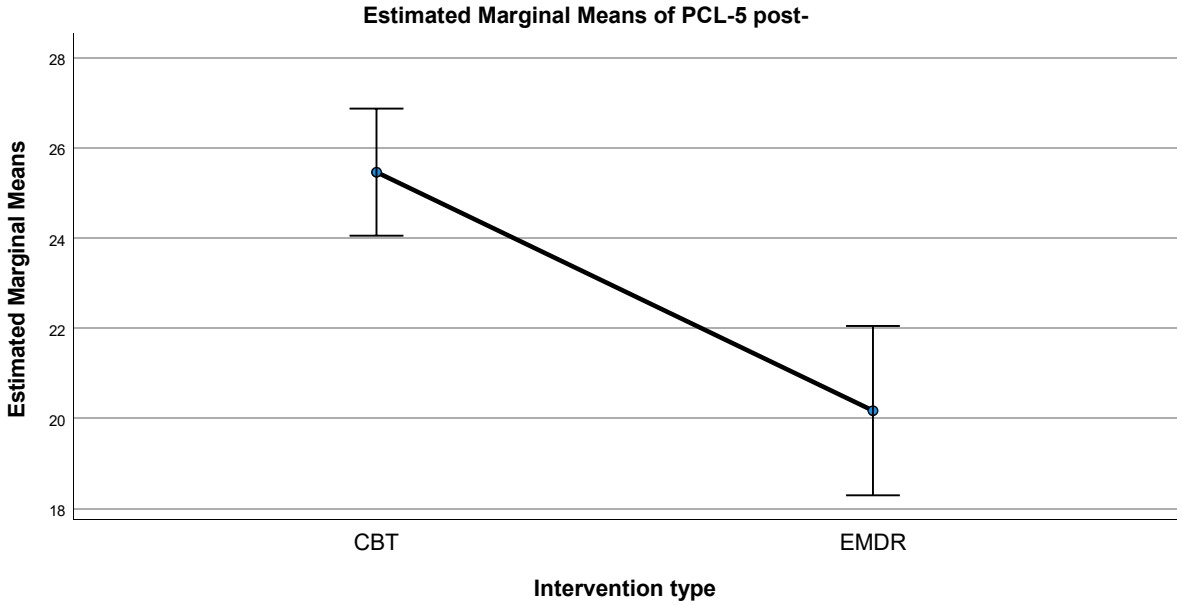
## Tests of Between-Subjects Effects

Dependent Variable: PCL-5 post-

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Corrected Model | 16447.573[a] | 2 | 8223.786 | 43.614 | <.001 | .132 |
| Intercept | 531.755 | 1 | 531.755 | 2.820 | .094 | .005 |
| PCL5pre | 13491.083 | 1 | 13491.083 | 71.549 | <.001 | .111 |
| Interventiontype | 3694.036 | 1 | 3694.036 | 19.591 | <.001 | .033 |
| Error | 107854.452 | 572 | 188.557 | | | |
| Total | 443328.000 | 575 | | | | |
| Corrected Total | 124302.024 | 574 | | | | |

a. R Squared = .132 (Adjusted R Squared = .129)

## Profile Plots




Covariates appearing in the model are evaluated at the following values: PCL-5 pre- = 51.72

Error bars: 95% CI

## T-Test pre-PHQ9 CBT vs EMDR

[DataSet2] C:\Users\Marina.Ulanova\OneDrive - Solent NHS Trust\Desktop\RESEARCH DATA\spss data w Z scores 9.6.2024.sav

### Group Statistics

| | Intervention type | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| PHQ-9 pre- | CBT | 374 | 16.69 | 5.116 | .265 |
| | EMDR | 207 | 19.12 | 4.507 | .313 |

### Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | |
|---|---|---|---|---|---|
| | | F | Sig. | t | df |
| PHQ-9 pre- | Equal variances assumed | 3.088 | .079 | -5.718 | 579 |
| | Equal variances not assumed | | | -5.929 | 472.020 |

### Independent Samples Test

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | Significance | | |
| | | One-Sided p | Two-Sided p | Mean Difference |
| PHQ-9 pre- | Equal variances assumed | <.001 | <.001 | -2.431 |
| | Equal variances not assumed | <.001 | <.001 | -2.431 |

### Independent Samples Test

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | | 95% Confidence Interval of the Difference | |
| | | Std. Error Difference | Lower | Upper |
| PHQ-9 pre- | Equal variances assumed | .425 | -3.266 | -1.596 |
| | Equal variances not assumed | .410 | -3.237 | -1.625 |

### Independent Samples Effect Sizes

| | | Standardizer[a] | Point Estimate | 95% Confidence Interval Lower | 95% Confidence Interval Upper |
|---|---|---|---|---|---|
| PHQ-9 pre- | Cohen's d | 4.908 | -.495 | -.667 | -.323 |
| | Hedges' correction | 4.914 | -.495 | -.666 | -.323 |
| | Glass's delta | 4.507 | -.539 | -.716 | -.361 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

## T-Test pre-PCL-5 CBT vs EMDR

### Group Statistics

| | Intervention type | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| PCL-5 pre- | CBT | 373 | 51.43 | 13.916 | .721 |
| | EMDR | 207 | 52.71 | 12.225 | .850 |

### Independent Samples Test

| | | Levene's Test for Equality of Variances: F | Levene's Test for Equality of Variances: Sig. | t-test for Equality of Means: t | t-test for Equality of Means: df |
|---|---|---|---|---|---|
| PCL-5 pre- | Equal variances assumed | 5.220 | .023 | -1.111 | 578 |
| | Equal variances not assumed | | | -1.152 | 473.255 |

### Independent Samples Test

| | | t-test for Equality of Means: Significance One-Sided p | t-test for Equality of Means: Significance Two-Sided p | t-test for Equality of Means: Mean Difference |
|---|---|---|---|---|
| PCL-5 pre- | Equal variances assumed | .134 | .267 | -1.284 |
| | Equal variances not assumed | .125 | .250 | -1.284 |

## Independent Samples Test

| | | t-test for Equality of Means | | |
|---|---|---|---|---|
| | | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | Lower | Upper |
| PCL-5 pre- | Equal variances assumed | 1.156 | -3.554 | .987 |
| | Equal variances not assumed | 1.114 | -3.473 | .905 |

## Independent Samples Effect Sizes

| | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | Standardizer[a] | Point Estimate | Lower | Upper |
| PCL-5 pre- | Cohen's d | 13.338 | -.096 | -.266 | .074 |
| | Hedges' correction | 13.355 | -.096 | -.266 | .074 |
| | Glass's delta | 12.225 | -.105 | -.275 | .065 |

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

## Univariate Analysis of Variance

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Intervention type | 1 | CBT | 373 |
| | 2 | EMDR | 205 |

### Descriptive Statistics

Dependent Variable: PHQ-9 post-

| Intervention type | Mean | Std. Deviation | N |
|---|---|---|---|
| CBT | 7.75 | 5.284 | 373 |
| EMDR | 6.26 | 3.954 | 205 |
| Total | 7.22 | 4.902 | 578 |

### Levene's Test of Equality of Error Variances[a]

Dependent Variable: PHQ-9 post-

| F | df1 | df2 | Sig. |
|---|---|---|---|
| 11.077 | 1 | 576 | <.001 |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + PHQ9pre + Interventiontype

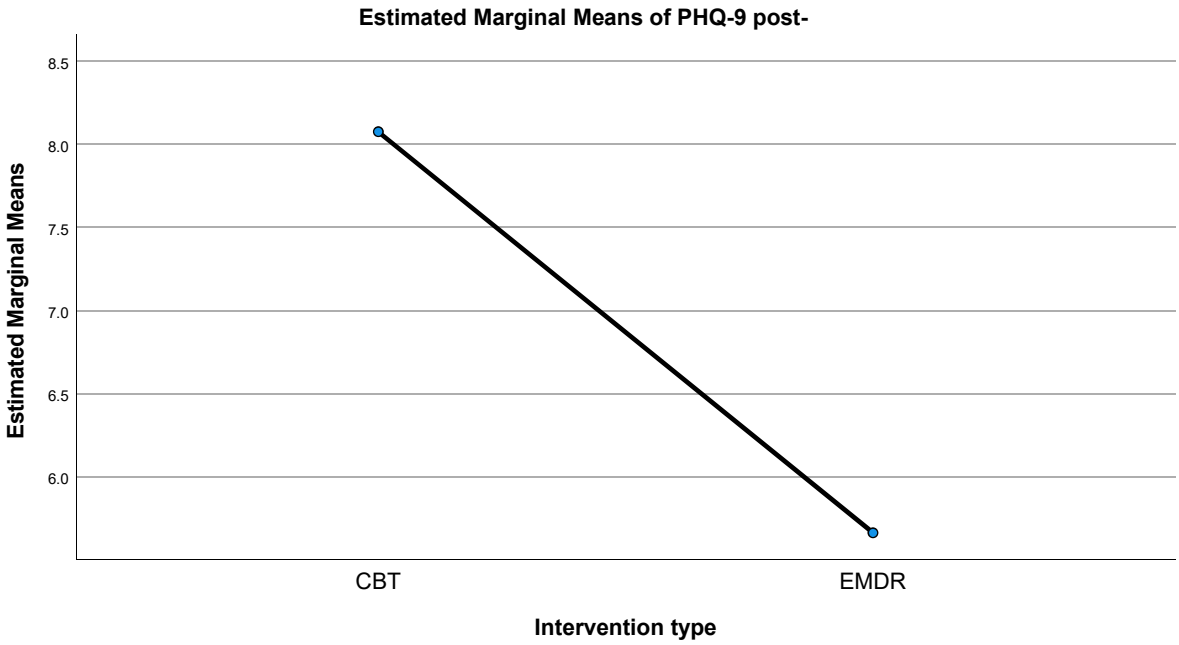
### Tests of Between-Subjects Effects

Dependent Variable: PHQ-9 post-

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Corrected Model | 2404.461[a] | 2 | 1202.231 | 60.307 | <.001 | .173 |
| Intercept | .006 | 1 | .006 | .000 | .986 | .000 |
| PHQ9pre | 2113.946 | 1 | 2113.946 | 106.042 | <.001 | .156 |
| Interventiontype | 730.076 | 1 | 730.076 | 36.623 | <.001 | .060 |
| Error | 11462.634 | 575 | 19.935 | | | |
| Total | 43995.000 | 578 | | | | |
| Corrected Total | 13867.095 | 577 | | | | |

a. R Squared = .173 (Adjusted R Squared = .171)

## Profile Plots




Covariates appearing in the model are evaluated at the following values: PHQ-9 pre- = 17.52

## Univariate Analysis of Variance

[DataSet2] C:\Users\Marina.Ulanova\OneDrive - Solent NHS Trust\Desktop\RESEARCH DATA\spss data w Z scores 9.6.2024.sav

### Between-Subjects Factors

| | | Value Label | N |
|---|---|---|---|
| Intervention type | 1 | CBT | 373 |
| | 2 | EMDR | 205 |

### Descriptive Statistics

Dependent Variable: PHQ-9 post-

| Intervention type | Mean | Std. Deviation | N |
|---|---|---|---|
| CBT | 7.75 | 5.284 | 373 |
| EMDR | 6.26 | 3.954 | 205 |
| Total | 7.22 | 4.902 | 578 |

### Levene's Test of Equality of Error Variances[a]

Dependent Variable: PHQ-9 post-

| F | df1 | df2 | Sig. |
|---|---|---|---|
| 12.890 | 1 | 576 | <.001 |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Interventiontype * PHQ9pre + Interventiontype + PHQ9pre

### Tests of Between-Subjects Effects

Dependent Variable: PHQ-9 post-

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 2455.349[a] | 3 | 818.450 | 41.167 | <.001 |
| Intercept | 10.695 | 1 | 10.695 | .538 | .464 |
| Interventiontype * PHQ9pre | 50.888 | 1 | 50.888 | 2.560 | .110 |
| Interventiontype | .008 | 1 | .008 | .000 | .984 |
| PHQ9pre | 1523.038 | 1 | 1523.038 | 76.607 | <.001 |
| Error | 11411.746 | 574 | 19.881 | | |
| Total | 43995.000 | 578 | | | |
| Corrected Total | 13867.095 | 577 | | | |

## Tests of Between-Subjects Effects

Dependent Variable: PHQ-9 post-

| Source | Partial Eta Squared |
|---|---|
| Corrected Model | .177 |
| Intercept | .001 |
| Interventiontype * PHQ9pre | .004 |
| Interventiontype | .000 |
| PHQ9pre | .118 |
| Error | |
| Total | |
| Corrected Total | |

a. R Squared = .177 (Adjusted R Squared = .173)