A Stage 1 Pilot Cohort Exploring the Use of EMDR Therapy as a Video-Conference Psychotherapy During Covid-19 – A Proof of Concept Study Utilising a Virtual Blind 2 Therapist Protocol

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Abstract

Background

The Covid-19 pandemic has had a major impact in the delivery of psychological treatment. Due to social distancing requirements provision moved to video-conferencing psychotherapy (VCP). There is a paucity of empirical data supporting the efficacy of EMDR therapy as a VCP. This stage 1 pilot study tested an EMDR therapy scripted protocol – Virtual Blind 2 Therapist (VB2T) as a VCP regarding fitness for purpose, distinctiveness, relevance, and efficiency.

Methods

Twenty-four participants were recruited to the study. The design included a one-session treatment intervention obtaining measures pre, post, one-month, and six-month follow-up. This treatment session used a 'Blind 2 Therapist' EMDR therapy scripted protocol as video-conference psychotherapy that involves non-disclosure of traumatic memory. The research explored the treatment effect on the core characteristics of the trauma memory including subjective disturbance, belief systems, memory intensity, vividness, and levels of emotionality. Additionally, the research explored participant's experiences of adverse and benevolent childhood experiences (ACEs/BCEs) during their childhood.

Results

Regarding the four tests - fitness for purpose, distinctiveness, relevance, and efficiency results are favourably suggesting potential clinical benefits of using EMDR as video-conference psychotherapy. That said this is a proof-of-concept study showing positive results, however, no clinical population or control group was used. The purpose of the study is to explore the potential for scalability towards a larger clinical trial. The treatment intervention was achieved irrespective of either adverse or benevolent childhood experiences (ACEs/BCEs) during childhood

Conclusion

The research tentatively supports the case for EMDR therapy as a credible treatment when used as a video conference psychotherapy. More research is needed to scale towards a clinical trial.

Background

In the attempt to reduce the risk of infections from Covid-19, many mental health care providers are closing their doors to patients requiring face-to-face therapy and instead of creating video-conferencing psychotherapy (VCP), remote access technology, e-health tools, and internet interventions (1, 2). Several comprehensive reviews highlight the effectiveness of video-conferencing psychotherapy (VCP) and therapist-guided interventions, with conditions such as anxiety, major depressive disorders, and trauma (1–15). VCP appear both 'feasible' and 'acceptable' as a mode of psychological treatment delivery, providing high satisfaction and effectiveness (16). Furthermore, VCP provides a viable alternative in providing continuity of care in times of social, economic, and health upheaval (17).

There are several distinct barriers towards the equitable provision of, and access to, evidence-based, face to face/in-person psychological treatments with a paucity of suitably qualified mental health workers to sufficiently address the global burden of mental illness and psychological trauma (18). With relatively few providers trained in the therapies underpinned by a solid empirical evidence base, those who live in rural or remote communities are further restricted. The barriers to care compounded further by disability, poverty, and stigma (13, 19, 20). VCP provides alternative flexibility and equity of access than in-person therapy, with potential for financial efficiencies and cost savings, enhanced reach, flexible implementation, improved cultural adaptability and sensitivity, and improved equity when compared with in-person therapy (19, 21–25).

Despite potential benefits, VCP does require critical consideration. One factor relates to the impact VCP has on the therapeutic alliance when assuming the 'In person', traditional model, the gold standard for psychotherapy. Recent studies (6, 16, 26) acknowledge that an effective therapeutic alliance is essential in underlying successful therapy. However, Simpsom (16). Table 1 outlines the advantages and disadvantages of using VCP's and how they can be adapted to promote greater effectiveness.

Table 1
Advantages, disadvantages, and adaption factors in VCP's

Advantages	Disadvantages	Adaptation Factors to promote greater effectiveness
<ul style="list-style-type: none"> o Greater flexibility o Cultural adaptability o Enhanced reach o Better use of scarce resources o Cost efficiencies o Increased accessibility o No geographical restrictions o Environmentally – reduces carbon footprint o Responds to the need for rural services for veterans o Convenience and affordability for disabled people 	<ul style="list-style-type: none"> o Technology knowledge, application, functioning, and reliability, including challenges o Poor internet connections, particularly in low socioeconomic areas o Body language restricted to head and face o Privacy into the home environment o Creating safe space, time, and relationships o Cultural considerations and norms o Risk management & triage o Geographical factors, legislation, professional indemnity, logistics o Insurance cover and liability 	<ul style="list-style-type: none"> o Adjusting for more restricted access to non-verbal communication o More regular 'checking in' with clients o Requesting more information and clarification on specific points o More focus on facial expressions and bodily gestures o More frequent emotion checking o Enhanced preparation before sessions o More control of the space o The therapists assuming a greater sense of ownership and responsibility for the therapeutic alliance within the therapy work o Client centredness – the Therapist 'tailoring' their approach more to the client individual and specific needs

The reality of the Covid-19 pandemic ostensibly has removed choice for a great many individuals, the options being VCP intervention, no intervention, or an extensive and uncertain period of waiting. The current advances in VCP technology enable it to offer an innovative solution as a viable alternative to in-person therapies.

The World Health Organisation(27) has expressed concern over the psychological impact that the pandemic and social distancing has had on the mental health of a broad sector of society. The psychosocial consequences include increases in loneliness, anxiety, depression, gender-based violence, insomnia, substance misuse, self-injurious activity, and suicidal behaviour (28–34). However, Covid-19 is not 'ground zero' when considering the mental wellbeing of a population. Those with pre-existing mental health issues before the pandemic risk minimisation, reclassification, and systemic loss within existing health care systems. It is essential to acknowledge that events that pre-date Covid-19 may still influence an individual's response. Two considerations are exposure to Adverse Childhood Experiences (ACEs) and Benevolent Childhood Experiences (BCEs). Exposure to ACEs is the single most potent global public health issue when considering social inequality, lifelong impact on health and behaviour, and social deprivation. Arguably the Covid-19 pandemic further compounds antecedent ACEs. Social inequalities such as these create significant barriers when accessing services, either in person or via VCP (35–44).

VCP interventions have primarily focussed upon Prolonged Exposure (13, 45–50), Behavioural Activation (45, 46, 51), Cognitive Processing Therapy (19, 52–54) and CBT (55, 56). Presently, limited research publications support EMDR therapy which uses VCP to treat Post-Traumatic Stress Disorder (PTSD (57–59). However, a recent study (60) used home-based psychotherapy, delivered by telehealth, as a treatment intervention for complex PTSD. The intervention was delivered in an intensive format, offering both Prolonged Exposure and EMDR therapy. Six participants took part in the study, with two-thirds losing their PTSD or complex-PTSD diagnostic status the study demonstrating that the telehealth intervention was both safe and effective (60). However, the sample size in their study was small, with just six participants, with only four of the six losing their diagnosis. Safety and effectiveness determinants of the EMDR therapy intervention indicate more extensive and more representative sample sizes.

EMDR therapy, an empirically supported intervention for PTSD and Complex PTSD (7, 61–66) was developed in the late 1980s by an American psychologist – Francine Shapiro. Its primary foci are on the treatment of pathogenic memories and their associated stress symptoms with the model of pathogenesis and change known as Adaptative Information Processing (67, 68). Shapiro (69) considered trauma memories in a range of mental health disorders and not just PTSD and Complex PTSD. Within the AIP theoretical framework, a meta-theory unique to EMDR therapy, the model assumes that the human brain can usually process memories of adverse life events to complete integration. The essence of EMDR therapy involves four distinct aspects – preparation, access, stimulation, and integration [PACI]. What gives EMDR therapy a specific distinctness relates to bi-focal physical stimulation, a working memory taxation device that

enables the client to attend internal and external stimuli (66, 70, 71). The hypothesised working mechanism of EMDR therapy is still under investigation (72). However, most evidence supports the working memory account. Working memory has a limited capacity. Therefore, dual taxation sets up a competing situation. Consequently, the emotional intensity of the pathogenic memory, with all its subjective levels of disturbance, is gradually lost and eventually reconsolidated into a less disturbing and reduced emotional form. Within the EMDR therapy literature, the dominant empirical evidence supports physical eye movements; however, other forms of bi-focal physical stimulation can include acoustic, somatic, or multiple forms such as is used within EMDR 2.0 (71).

The core characteristics of the EMDR B2T protocol access and activate a pathogenic memory. However, the primary distinction from the Standard Protocol is that the client reveals no details about the memory itself, other than its emotional and somatic content, and an indication of their subjective unit of distress (SUD). Clients are under no pressure to disclose any of the trauma content during trauma processing using B2T. Table 2 highlights the core components of the EMDR therapy B2T, its context regarding the eight phases of therapy, and the assessment phase (Phase 3 of the standard protocol of EMDR therapy).

Table 2
EMDR Blind 2 Therapist Protocol in Context - adapted from Farrell et al., (18)

EMDR therapy: 8 phases	EMDR therapy Phase 3 Standard Protocol – Assessment Structure	EMDR therapy Phase 3 Assessment Blind 2 Therapist structure and VB2T version
Phase 1: history taking	Target Memory	Target memory – cue word
Phase 2: preparation	Worst Image	Emotions
Phase 3: assessment	Negative Cognition	Subjective Unit of disturbance (SUD 0-10)
Phase 4: desensitisation	Positive Cognition	Location of body sensation
Phase 5: installation	Validity of Cognition (1-7)	
Phase 6: body scan	Emotion	
Phase 7: closure	Subjective Unit of Disturbance (0-10)	
Phase 8: re-evaluation	Location of body sensation	

Many empirically supported treatments for PTSD contain various elements and degrees of exposure. These rely upon the client's ability and willingness to disclose the memory of the adverse life event causing a stress response. When pathogenic memories involve - shame, guilt; disgust; fear of retribution; lack of language; non-disclosure self-protection/ preservation factors, then disclosure may not even be a viable option for a client. A study published from research carried out in Northern Iraq tested an adaption of EMDR therapy known as the 'Blind 2 Therapist' (B2T) protocol. This study demonstrated the safety, effectiveness, efficiency and relevance as a treatment intervention for both 'shame-based and' fear of retribution' trauma (18). However, an evaluation of EMDR B2T as a VCP method of delivery has not occurred to date. Therefore, this study aimed to test the virtual version of B2T (referred to as VB2T), delivered as a VCP, as a suitable clinical intervention in the desensitisation and reprocessing of a pathogenic memory.

As indicated earlier, within the existing EMDR therapy literature, there is a paucity of research into the use of VCP EMDR (60). In addressing this aspect any potential study would have to address two significant aims:

1. What adaptations, if any, would be required to use EMDR therapy as a VCP?
2. Critically consider potential advantages/ disadvantages of EMDR therapy as a VCP?

Therefore, the purpose of this study was to determine whether the application of VCP EMDR therapy would be associated with (1) Fitness for purpose – safe and effective, (2) Distinctiveness – alterations of the core components of a pathogenic memory regarding intensity, vividness, and emotionality, (3) Relevance, and (4) Efficiency.

A directional hypothesis is a prediction of positive or negative change between two variables in a specific population. These changes were measured by pre, post, 1-month, and 6-month follow-up. The research study hypotheses were as follows:

Hypothesis 1 Fitness for Purpose – Virtual Blind 2 Therapist EMDR (VB2T), when delivered as a video-conference psychotherapy, will have no impact on the Subjective Unit of Disturbance (SUD) and the Validity of Cognition (VOC) in regard to a pathogenic memory when measured at post-treatment, 1-mth and 6-mth in comparison with a pre-measure.

Hypothesis 2 Distinctiveness – VB2T, as a VCP, will have no impact in reducing Memory Intensity (MI), Memory Emotionality (ME), and Memory Vividness (MV) of a pathogenic memory following intervention when measured at post-treatment, 1-mth and 6-mth in comparison with a pre-measure.

Hypothesis 3 Relevance – When using VB2T, Adverse Childhood Experiences (ACEs) or Benevolent Childhood Experiences (BCEs) will influence the processing of a pathogenic memory.

Hypothesis 4 Efficiency – VB2T will take longer in time than the 60-90 minutes recommended by www.emdria.org, and therefore would be more expensive as a clinical intervention.

Methodology - Research Design

Ethical approval

for the study was granted through University of Worcester (UK) [CBPS1920031-R2]. Consequently, all the methods used for the study were carried out in strict adherence to the ethical approval granted and in accordance with relevant guidelines and regulations. Informed consent was obtained from all subjects. Additionally, the study was registered as a clinical trial ID ICSRCTN12099530 [30/06/2021]. This stage 1 pilot study used a pre-test/post-test design taking measures before and after a one-session treatment using the EMDR VB2T protocol, including 1-month and 6-month follow-up to determine the impact of the treatment intervention on the pilot cohort. The rationale for an experimental design as a stage 1 research project was to determine proof of concept before proceeding to stage 2 involving a quasi-experimental design utilising a distinct control group. The longer-term strategy is for phases 1 and 2 to support a more significant funding application utilising a randomised control design incorporating a delayed treatment paradigm.

Participants

Using EMDR therapy and the VB2T protocol as a VCP is a contemporaneous research idea in relation to the software package needed to deliver it. Mindful of this the VCP software developers wanted to test their product to be safe as an application for clinical practice, more particularly with EMDR therapy. Consequently, the study used a within-community population group consisting of highly experienced, UK based, EMDR therapists. The design of the study incorporated a self-selecting (volunteer) sampling. The inclusion criteria were: –

- EMDR Europe Accredited Consultant,
- Encountered an adverse life event that generated a presently held, subjective level of disturbance (SUD)
- Willingness to be a client for a one-session intervention using the EMDR therapy Blind 2 Therapists protocol (VB2T) as a VCP, using the remotEMDR platform.

This sampling method was selected as it is highly consistent with what occurs during accredited EMDR therapy and CBT teaching and learning programmes (18, 73–76). A sample size of 17 was deemed sufficient to compare findings from the original study, which used the EMDR Blind 2 therapist protocol with participants from Northern Iraq (18). However, as N=24 met the required inclusion criteria, all were recruited into the study.

Measures Used For The Study

The pre-test/post-test design utilised the following measures:

Subjective Unit of Disturbance (SUD) is a scale of 0-10 for measuring subjective levels of distress or disturbance currently experienced by an individual (77).

Validity of Cognition Scale (VOC) provides a rapid assessment of cognitive structure on an emotional/ somatic level rather than intellectual (69, 78, 79). Both the SUD and VOC have documented validity, reliability, and correlations with several physiological indices of distress.

Memory Vividness (MV) and Emotionality (ME) – Subjective unit of measurement (0 – 10) of the vividness of the target memory, either positive or negative (80–87).

Memory Intensity (MI) - Subjective unit of measurement (0 – 10) of the intensity of the target memory, either positive or negative (88–90).

Adverse Childhood Experiences Scale (ACE) collect crucial information based upon the prevalence of adversity during childhood in ten categories before the age of eighteen: emotional abuse (recurrent), physical abuse (recurrent), sexual abuse (contact), physical neglect, emotional neglect, substance misuse in the household, mental illness in the household, mother treated violently, divorce or parental separation, and criminal behaviour in the household (41). With each category counting as one point, with ten categories, the highest possible ACE score is 10 (40, 42, 91–96). An additional component of the ACEs was to test the study participants group for comparability with the original CDC Kaiser Permanente Study (42). Because it is a UK study, the ACEs replication studied carried out Bellis et al., 2015).

Benevolent Childhood Experiences (BCEs) scale is a new instrument designed to assess positive early life experiences in adults with a history of childhood adverse experiences. Ostensibly, BCEs, are a counterpart to the Adverse Childhood Experiences (ACEs) questionnaire. The BCEs (95) are multiculturally sensitive and applicable regardless of socioeconomic position, urban-rural background, or immigration status. The BCEs items utilise developmental psychology framework, integrated with ecological systems theory (64, 95, 97–103).

Time (minutes) using the metric period recommended by EMDRIA sessions; 60 – 90 minutes, measuring from commencement of Phase 3 – Assessment, to completion of Phase 7 – Closure (including debrief).

Cost per session (£'s/€'s) using economic modelling from the University of Worcester calculated at £56.49 (€66.36).

One month after each VB2T session, another research team member carried out Phase 8 Re-evaluation, conducted a qualitative interview, and obtained 1-month follow-up data—additional psychometric data collected at 6-months also.

Treatment

The research utilised a 1-treatment session intervention (EMDR VB2T as a VCP), a partial replication from a previous study (18). This study used a beta-tested software programme called remotEMDR (<https://www.remotEMDR.com>), a technology that enabled the delivery of EMDR as a VCP. The remotEMDR is a synchronous programme that offers various visual and acoustic forms of bi-focal physical stimulation and includes an integrative video platform, giving EMDR therapists complete control within the session.

The EMDR therapy VB2T protocol, adapted for VCP usage, originated from the original B2T (104), including pathogenic memory vividness, intensity, and emotionality metrics.

An EMDR Europe Accredited Senior Trainer and Consultant carried out each of the VB2T treatment sessions, each digitally recorded and made available for treatment fidelity checking. EMDR Europe Consultants and Co-researchers carried out these fidelity checks to the project. The EMDR Foundation Fidelity Rating Scale (EFRS) – version 2 developed initially by der Kolk et al. (90), subsequently revised and updated by Maxfield et al (105).

VB2P sessions incorporated multiple consent points, including initial recruitment, the commencement of the VB2T session, permission to record digitally, and permission to utilise the research participants data at the end of the VB2T session.

Statistical analysis

Statistical analysis utilised the Statistical Package for Social Sciences (SPSS version 26.0; Chicago, IL, USA) to include means and standard deviations calculated for SUD, VOC, MV, ME, and MI before treatment, post-treatment, and at 1- and 6-months follow-up (Table 3). Data sets included skewness and kurtosis, calculated to estimate the normality of the outcome measures, frequencies of total and individual scores for ACEs and BCEs. This detailed examination and alpha testing, which included generalised estimating equations (GEE) to compare before/after the intervention, and follow-up changes in SUD, VOC, MV, ME, and MI. Added were ACEs and BCEs as the covariates in the modelling exercise. The GEE model accounts for time variations and correlations among repeated measurements and does not require the dependent variable to be normally distributed (106, 107). Gamma with log link was selected as the outcome

variables were skewed. The presence of negative values for SUD, MV, ME, and MI measures was handled by adding a constant value to the data before the analysis. As for descriptive statistics, we used mean $\pm$ standard deviation ($\pm$ SD) for numerical variables and percentage (%) for categoric variables. *p*-Values of $<.05$ were considered significant. An overall effect size using Hedges *g* was calculated.

Table 3
Descriptives – Subjective Unit of Disturbance (SUD) & Validity of Cognition (VOC): pre, post, 1-mth, & 6-mth follow-up

Intervention		Pre SUD	Post SUD	SUD 1-mth FU	SUD 6-mth FU	Retro VOC Pre	VOC Post	VOC 1-mth FU	VOC 6-mth FU
N	EMDR therapy VB2T as a VCP	24	24	22	20	24	24	22	19
Mean		7.75	0.167	0.545	0.350	2.00	6.96	6.86	6.89
Median		8.00	0.00	0.00	0.00	2.00	7.00	7.00	7
Standard deviation		1.39	0.482	0.739	0.587	0.780	0.204	0.351	0.315
Minimum		5	0	0	0	1	6	6	6
Maximum		10	2	2	2	3	7	7	7

Table 4
Descriptives – Memory Vividness (MV), Memory Emotionality (ME), Memory Intensity (MI): pre, post, 1-mth, & 6-mth follow-up

Intervention		MV Pre	MV Post	MV 1-mth FU	MV 6-mth FU	ME Pre	ME Post	ME 1-mth FU	ME 6-mth FU	MI Pre	MI Post	MI 1-mth FU	MI 6-mth FU
N	VB2T	24	24	22	19	24	24	22	19	24	24	22	19
Mean		8.04	1.42	0.227	0.579	8.33	0.417	0.0909	0.211	8.46	0.0417	0.409	0.474
Median		8.00	0.00	0.00	0	8.00	0.00	0.00	0	8.00	0.00	0.00	0
Standard deviation		1.78	2.41	1.82	1.46	1.43	0.717	2.20	1.23	1.41	0.999	1.99	1.68
Minimum		5	0	-7	-3	6	0	-8	-4	6	-4	-6	-6
Maximum		10	8	2	2	10	2	3	1	10	2	1	1

Results

Of the N=24 EMDR Europe Consultants who took part in the study, all completed the VB2T treatment session and post-treatment, 1-mth, and 6-mth follow-up measures. There were no dropouts from the study. Tables 3 and 4 highlight the descriptive data regarding various measures – SUD, VOC, MV, ME, and MI, and pre, post, 1-mth, and 6-mth follow-up.

Hypothesis 1

Figure 1 shows the decrease in SUD and the increase in the Validity of Cognition (VOC) at the post, 1- and 6-month follow-up.

Additionally, in more detail, Table 5 highlights the mean, standard deviation, skewness, kurtosis, baseline, and *p* values for the SUD and VOC at pre, post, 1-mth and 6-mth follow-up and the maintenance of the VB2T treatment effect.

Table 5
Means, SD, skewness, and kurtosis for SUD and VOC at pre, post, 1-mth & 6-mth FU

	Mean (SD)	Skewness (SE)	Kurtosis (SE)	B (SE)	p value
Pre-SUD	7.75 (1.39)	-.15 (.47)	-.95 (.92)	0	
Post-SUD	.21 (.49)	2.72 (.47)	7.73 (.92)	-1.02 (.03)	<.001*
1 m FU SUD	.64 (.79)	.78 (.49)	-.89 (.95)	-.94 (.05)	<.001*
6m FU SUD	.23 (.95)	-1.74 (.51)	6.99 (.99)	-.99 (.01)	<.001*
Pre-VOC	2.02 (.79)	-.08 (.47)	-1.36 (.92)	0	
Post-VOC	6.96 (.20)	-4.90 (.47)	24.00 (.92)	1.22 (.07)	<.001*
1 m FU VOC	6.87 (.31)	-2.60 (.49)	5.63 (.95)	1.21 (.08)	<.001*
6 m FU VOC	6.92 (.25)	-3.34 (.52)	11.19 (1.01)	1.22 (.08)	<.001*

There was a substantial reduction in SUD after receiving EMDR in comparison with the baseline assessment ($B=-1.02$, $SE=.03$, $p<0.001$). The decrease in SUD maintained in the follow up assessments – 1 month ($B=-.94$, $SE=.05$, $p<0.001$) and 6 months ($B=-.99$, $SE=.04$, $p<0.001$) in comparison with the baseline. Simultaneously, there was an increase in VOC after receiving EMDR in comparison with the baseline assessment ($B=1.22$, $SE=.07$, $p<0.001$). The increase maintained after 1-month ($B=1.21$, $SE=.08$, $p<0.001$) and 6 months ($B=1.22$, $SE=.08$, $p<0.001$) post intervention.

The results of this study indicate that VB2T decreased the SUD and increase the VOC in the treatment of a pathogenic memory tested at pre, post, 1-mth and 6-mth follow-up, suggesting that using VB2T as a video conferencing psychotherapy demonstrated a treatment effect on the pathogenic memory when measured by the SUD and VOC. Furthermore, there was a statistically significant difference between pre-treatment ($M=7.75$, $SD=1.39$) and 6-month follow-up ($M=0.35$, $SD=0.59$), with a Hedges' g effect size value ($g=6.71$) suggesting high practical significance. Therefore, we reject the null hypothesis that there is no difference on the Subjective Unit of Disturbance (SUD) or Validity of Cognition (VOC) when using the VB2T EMDR intervention as a video-conference psychotherapy.

Hypothesis 2

Figure 2 shows the reduction in the nature and characteristics of the pathogenic memory, including memory vividness, emotionality, and intensity. For some research participants, alterations in memory characteristics indicated positive change rather than disturbance (negative), and therefore positive change is presented as a minus score.

As figure 2 demonstrates the VB2T intervention clearly impacted on three areas of distinctiveness of the pathogenic – memory vividness, emotionality, and intensity, with results maintained at both 1-mth and 6-mth FU. There were significant decreases in MV ($B=-.42$, $SE=.05$, $p<0.001$), ME ($B=-.61$, $SE=.03$, $p<0.001$), and MI ($B=-.77$, $SE=.04$, $p<0.001$) following the intervention. These effects maintained in the first month follow-up for ME ($B=-.65$, $SE=.06$, $p<0.001$), MI ($B=-.79$, $SE=.03$, $p<0.001$), MV ($B=-.60$, $SE=.07$, $p<0.001$), and sustained after six months for MV ($B=-.58$, $SE=.03$, $p<0.001$), ME ($B=-.62$, $SE=.03$, $p<0.001$), MI ($B=-.79$, $SE=.04$, $p<0.001$). Overall, these results indicate changes that were consistently, statistically significant at $p<0.001$. Additionally, results demonstrate a favourable dose effect, with potential evidence in support of resilience and post-traumatic growth, as indicated the treatment effect emphasises between pre and 6-mth FU. This represents a significant finding from this study.

Therefore, it would be reasonable to assume that when VB2T delivered as a VCP, it has the potential to instigate distinct changes to core components of the pathogenic memory, suggesting evidence of memory reconsolidation. Regarding hypothesis 2: Distinctiveness – VB2T, as a VCP, will have no impact in reducing Memory Intensity (MI), Memory Emotionality (ME), and Memory Vividness (MV) of a pathogenic memory following intervention when measured at post-treatment, 1-mth and 6-mth in comparison with a pre-measure, results do not support this, therefore we reject the null hypothesis

Hypothesis 3

Figures 3 & 4 demonstrate exposure to Adverse Childhood Experiences (ACEs) or Benevolent Childhood Experiences (BCEs) did not influence the processing of the pathogenic memory or the intervention outcome following the utilisation of VB2T.

As explained previously, testing the relevance hypothesis compared the study participant group with the original primary studies (35–39, 42). A single factor ANOVA explored the between-group variances. This one-way analysis of variance is a technique used to compare two or more samples when utilising numerical or categorical data.

Figure 4 highlights the prevalence of ACEs between studies (35, 42). A descriptive review of the results suggests higher exposure to 4+ ACEs within the VB2T participant group; however, results yielded a $F(3, 4) = 8.45$, $p\text{-value} < .03^*$ suggesting that there were indeed differences between the three groups in terms of the prevalence of ACEs, therefore rejecting the null hypothesis.

Table 6
*Types of Adverse Childhood Experiences (ACE) * $P < .001$*

ACEs	Incidence	Sig. (2-test)
Psychological abuse	7 (33%)	.189
Physical abuse	2 (10%)	<.001*
Sexual abuse	4 (19%)	.007
Emotional neglect	9 (43%)	.664
Physical neglect	2 (9%)	<.001*
Parental divorce	6 (26%)	.035
Mother physical abuse	0 (0%)	<.001*
Household substance abuse	4 (17%)	.003
Household mental illness	8 (35%)	.210
Criminal behaviour in household	0 (0%)	<.001*

Table 6 provides more descriptive data of the VB2T participant group relating to specific exposure to adverse childhood experiences (ACEs). Results focussed on exposure to physical abuse, physical neglect, mother physical abuse, and criminal behaviour in the household.

Although an ANOVA revealed a distinction between the three groups, it is essential to highlight the elevated incidence of exposure to psychological abuse, emotional neglect, household mental illness, absence of exposure to mother physical abuse, and criminal behaviour in the household VB2T research participant group. Figure 5 rank scores the ten questions of the original ACEs questionnaire from most prevalent (1) to least (10).

Figure 6 compares the frequency of both ACEs and BCEs from the VB2T research population. The mean ACE of 1.8 (SD 1.68) and BCE of 7.6 (SD 2.06). The correlation between ACEs & BCEs is $r(22) = -.48$.

For the benevolent childhood experiences (BCEs), the mean for the sample was 7.6 ($SD = 2.06$), and the median was 8. As can be seen from Table 7, most participants reported having eight (17.4%), nine (21.7%), and ten (21.7%) benevolent experiences in their childhood. All participants reported at least four BCEs. Table 5 displays the frequency of each type of BCEs in the current sample. Results suggest that having "At least one good friend" (96%) and "Opportunities to have a good time" (91%) were the most frequent benevolent experiences.

Table 7
Types of Benevolent Childhood Experiences (BCEs)

BCEs	Incidence	Sig. (2-test)
At least one caregiver with whom you felt safe	18 (78%)	.011
At least one good friend	22 (96%)	<.001*
Beliefs that gave you comfort	16 (70%)	.093
Enjoyment at school	18 (78%)	.011
At least one teacher that cared	20 (87%)	<.001*
Good neighbours	17 (74%)	.035
An adult (not a parent/ caregiver or the person from *11) who could provide you with support or advice	12 (52%)	1.000
Opportunities to have a good time	21 (91%)	<.001*
Like yourself or feel comfortable with yourself	12 (52%)	1.000
Predictable home routine, like regular meals and a regular bedtime	20 (87%)	<.001*

In exploring further hypothesis 3: Relevance – firstly, results seem to indicate that neither ACEs nor BCEs score bore no influence on the outcome. did not influence the outcome of the intervention. Secondly, although 75% of the research participants admitted their motivation for participation being based firmly on 'non-disclosure', however, results indicated 87.5% did disclose their target memory to the treating clinician. Of these 87.5%, Table 8 highlights the categories of target memories disclosed.

Table 8
Disclosed target memory themes and frequencies
chosen by research participants for VB2T as a VCP

o sexual assault (3)
o child abuse (4)
o parental neglect (1)
o fatal road traffic collision (1)
o occupational bullying (4)
o complicated grief (2)
o episodes involving shame and humiliation (6)

As indicated earlier, using VB2T demonstrates a distinct treatment effect with Table 8 highlighting clinical applicability. In addition, the desensitisation and reprocessing of these trauma memories occurred irrespective of either ACEs or BCEs. These results were consistent at 1 and 6-month FU. Consequently, this data set supports the assertion of hypothesis 3.

Regarding hypothesis 3 results suggest rejection of the null in relation to ACEs and BCEs.

In testing hypothesis 4: Efficiency – the administration of VB2T was tested against the period recommended by EMDRIA sessions; 60 – 90 minutes. Results for this study used a time metric (minutes) from commencement of Phase 3 – Assessment, to completion of Phase 7 – Closure (including debrief). Of the N=24 research participants, the average VB2T session was 57 minutes and 27 seconds, with an SD of 17 minutes 27 seconds. Results highlight that the treatment sessions were below the 60 Minutes threshold.

Testing the costing element within hypothesis 4 required economic modelling using University of Worcester financial algorithms. The UW costing model used for each VB2T treatment session was calculated at £56.49 (€66.36). Of the 24 clinical sessions of VB2T carried out the mean cost per session was £54.02 (€63.45). This represented potential modest savings of £2.47 (€2.91) per session. However, Figure 7 indicates the variance in treatment costs of each individual session. An additional consideration one of the distinct advantages of remote intervention is the reduction in client related costs, such as travel time, transportation, parking, etc.

Results indicate savings in terms of time and efficiency, with additional health economic benefits. Regarding hypothesis 4 results suggest rejection of the null.

Discussion

The rationale for this study was to ascertain how EMDR therapy could be used as a video conferencing psychotherapy considering the current Covid-19 pandemic where social distancing is a vital strategy in reducing infection rates. However, more specifically, this research wanted to explore the potential use of the EMDR therapy Blind 2 Therapist Protocol (VB2T) virtual version – as a VCP-to determine its fitness for purpose, distinctiveness, and relevance and efficiency.

The research participants for this study represented highly experienced EMDR therapy clinicians, all of whom were actively engaged in current clinical practice during the Covid-19 pandemic. Despite being experienced clinicians, many of the research participants had not previously encountered VCP EMDR therapy in the role of 'client'. One participant disclosed that they had not received EMDR therapy since their initial training – which was 20 years previously. The fact that the average SUD score for the N-24 research participants was 7.75 (SD 1.39) is worthy of note. The memory targets identified in Table 6 suggest that the research participants worked on pathogenic memories of major adverse life events; the mean SUD score, nonetheless, is intriguing. An expectation would suggest a higher mean SUD considering the trauma themes involved. This would certainly account for such an extremely large effect size (*hedges' g* = 6.71). This issue is worthy of further investigation and consideration.

Caution does need to be exercised with regards to hypothesis 1. Results indicate an extremely large effect size, although alterations in SUD and VOC are highly consistent in EMDR therapy clinical practice, the studies research population are experienced EMDR therapists – highly conversant with EMDR therapy practice, and therefore already extremely positive towards EMDR therapy. For this reason, future research needs to utilise both an experimental design and a clinical population, both of which would potentially deliver a more realistic treatment effect size.

To the best of our knowledge, this is the first EMDR therapy study that has examined both Adverse (ACEs) and Benevolent (BCEs) childhood experiences. The most significant ACEs was emotional neglect, exposure to household mental illness, and psychological abuse up to 18 years of age. However, exposure to mother physical abuse, and criminal behaviour in the household, with exposure to physical abuse and physical neglect, presented as the more prevalent ACEs in this research population.

The BCEs highlighted positive early life experiences in adults that built resilience and provided a counterbalance to ACEs. These positive childhood experiences include effective caregiving, quality in parenting, close relationships with other significant adults, effective schooling, and community. Higher BCEs is associated with more favourable long-term development (108). Within the participant group, the most decisive factors included having at least one good friend, at least one teacher that cared, opportunities to have a good time, and a predictable home routine. Although the data set indicates high levels of BCEs, caution is required as the study participants were highly trained mental health professionals and are not a clinical population. That considered, other interesting observable aspects from the dataset highlight a dichotomy between having an adult (other than a caregiver) who could provide support and advice and liking or feeling comfortable with oneself. More research is needed to understand further the impact that ACEs & BCEs have on and explore further if and how BCEs act as a potential resilience to counteract the impact of ACEs. However, the results of this study highlight that trauma processing occurred using VB2T irrespective of the research participants ACE or BCE scores.

Regarding testing hypotheses 1 through 4, the results from the study indicate a treatment effect from using the remotEMDR software to carry out VB2T as a Video-conferencing Psychotherapy (VCP). Although the alterations in SUD and VOC are highly consistent with the more comprehensive empirical support for EMDR therapy, the data highlighting personal changes to the characteristics of the pathogenic memory targeted from processing is undoubtedly intriguing. Again, caution is necessary as the sample size is relatively small and would need further testing with a clear clinical population with a more formal medico-legal diagnosis. Nonetheless, results are auspicious.

In testing hypothesis 3 – relevance, results for disclosure (90%) appear consistent with the previous B2T study in Northern Iraq (18) highlighting a clear clinical benefit in using both B2T & VB2T EMDR therapy protocols. This VB2T study adds to the literature demonstrating equal effectiveness and suggests a potential correlation between non-disclosure and level of SUD. The desensitisation and reprocessing of the pathogenic memory increase the probability of disclosure with results of 87.5% for this VB2T study. The clinical advantages of this make this an effective tool to use as a trauma treatment intervention, highlighting a distinct benefit of using EMDR

therapy for undisclosed trauma memories compared to other trauma-focussed interventions. Again, caution is required as further research is needed to investigate this aspect.

The use of three additional subjective measure – memory intensity, memory vividness, and memory emotionality, within this study suggests an argument for including these within the EMDR therapy B2T and the VB2T protocol, but also within the standard protocol. These measures appear particularly useful in understanding the subjective experience of the trauma memory targeted for processing. Further research and investigation are needed to pursue this argument further.

Although this was only a 1-treatment session study, the data set reveals an interesting health economic argument with an average session cost of £56.49 (€66.36). Although the study yielded modest economic savings of £2.47 (€2.91) per session the cumulative implications of this, in addition with the clinical benefits, suggest a particularly compelling argument.

There are two major flaws within this study. Firstly, the research participant group – they are not on a non-clinical population, they are also highly positive in disposition towards EMDR therapy. Moving towards a study with a distinct clinical population is essential for further research. Secondly, this was a straightforward pre-test – post-test research design, a future study would need to utilise a more experimental framework. As the study involves non-disclosure of a trauma memory, randomisation would not be possible, for ethical reasons, and therefore a quasi-experimental design could be a viable alternative.

To summarise, the research results suggest VB2T EMDR therapy to be an effective, fit for purpose, safe to use trauma treatment intervention. Additionally, results highlight its clinical relevance and applicability as a trauma intervention. Furthermore, the remotEMDR software provided a highly effective platform offering in delivering EMDR therapy as a VCP. Although the researchers acknowledge that other platforms exist, results from this study are based entirely on remotEMDR.

Conclusion

This research study demonstrated encouraging evidence in support of EMDR therapy as video-conferencing psychotherapy in treating a pathogenic (trauma) memory. In addition, the study explored specific factors influenced by the treatment intervention. What this study's results highlight is the potential in using EMDR therapy, in this case using the B2T protocol as a VCP. Furthermore, results suggest the intervention to have clinical applicability. Caution does need to be exercised regard both the lack of a clinical population, and the need for a more experimental design.

However, to have an intervention that appears effective with either shame, or fear-based trauma memories suggests great potential regarding clinical applicability. To have such an intervention that works on trauma memories clients are unwilling to disclose, for fear, blame or prejudice, suggests distinct advantages for EMDR therapy in the repertoire of empirically supported trauma treatment interventions. Furthermore, to have such an intervention that appears safe and effective adds more temerity to this assertion. This study highlights how the VB2T EMDR therapy scripted protocol alters core characteristics of the pathogenic memory itself, including memory disturbance, emotionality, intensity, and vividness. Results also demonstrate that these changes occur irrespective of either ACEs or BCEs. Another critical finding relates to resilience and post-traumatic growth factors more powerful when considering a stark choice for clients – disclosure of the memory or no treatment, they choose no treatment. To provide a credible alternative in this critical decision-making juncture suggests distinct clinical benefits and applicability. Potential health efficiency arguments highlighted by this research are tentative yet worthy of further investigation and critical consideration.

In summary, these results demonstrate proof of concept, and puts forward the case for further research and investigation. The stage 2 aspect of the study will further test the EMDR intervention as a VCP with a defined control group. The research supports the case for EMDR therapy as a credible treatment when used as a video conference psychotherapy. Although a compelling argument this is still a pilot study and not a clinical one, therefore, scalability would require further investigation with a distinct clinical population. At this stage, results from this pilot study need to be viewed with some degree of caution as this stage 1 research incorporated a self-selecting participant group, with an existing, and strong, disposition towards EMDR therapy. This bias needs to be both open and transparent. That said, the Covid-19 pandemic has challenged existing mental health and psychology services enormously. As the global burden of psychological trauma continues unabated, and we remain in an environment of scarcity in resources, any intervention that provides distinct choice and effectiveness in treating shame or feared based memories is a compelling argument, and much needed treatment approach. That such an intervention has potential health efficiency benefits strengthens this argument further. Any intervention, virtual or not, which improves accessibility and reach must be welcomed.

Declarations

Ethics approval: Ethical approval for the study was granted through University of Worcester (UK) [CBPS1920031-R2]. Consequently, all the methods used for the study were carried out in strict adherence to the ethical approval granted and in accordance with relevant guidelines and regulations.

Ethics Statement: This study involved human participants, and therefore ethical approval for the study was granted by University of Worcester (UK), College of Health, Life, & Environmental Sciences [CBPS1920031-R2]. The research participants provided their written consent to participate in the study.

Consent: Informed consent was obtained from all subjects

Consent for publication: as the Principal Investigator of the research team, on behalf of the team, we give consent for publication

Data Availability Statement: The raw data supporting this research, and subsequent article, is available from the Open-Source Repository <https://osf.io/dashboard>

Competing interests: we declare that there are no competing interests with regards to this research project or subsequent publication.

Funding: We declare that this was an unfunded study

Author Contributions: DF conceived the study, carried out the VB2T treatment sessions, and was the Chief Investigator for the project. LK, PM, and ZZ were part of the research team and acquired the follow-up data and conducted the qualitative interviews. AF, DF & MK carried out the data analysis. The primary author was the principal investigator; however, all authors contributed to the overall article and approved the submitted version for publication.

Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest. No incentives, financial or otherwise were offered to research participants.

Although remotEMDR is a commercial product no financial inducements were offered to conduct the research.

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Figures

Figure 1

Alterations in SUD & VOC scores at pre, post, 1-mth & 6-mth FU

Figure 2
Changes in Pathogenic Memory Subjective Characteristics

Figure 3

Figure 4

Prevalence of ACE scores between the three groups: VB

Figure 5

Figure 6
Frequency of Adverse (ACE's) & Benevolent (BCE's) scores of the research participants

Figure 7
Variance in cost of VB2T treatment sessions carried out as a VCP

Supplementary Files

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- [EMDRasVCPResearchProtocolDF18102021.docx](#)
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