EIJASR
New Frontiers in Research

South American Journal of Psychology

Volume 1,
Issue 1

South American Journal of Psychology
Volume 1, Issue 1, 2016

Effectiveness of Group CBT with Memory Specificity Training In Moderately Depressed Adults in Two London Boroughs

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Abstract

Memory specificity training (MEST) alone may improve depressedmood through increased memory specificity as found in previous studies. The purpose of the research was to build and expand on the use of MEST by testing the efficacy and feasibility ofseven treatment sessions with a three month follow up of group CBT with MEST in moderately depressed adults. An initial sample of 60 adult participants had been recruited through advertisements and screening procedures within two London Boroughs. They were block randomised to ensure equal gender and allocated to a within group design with repeated measures using the Autobiographical memory Test to measure changes in memory specificity (AMS) and theBeck depression inventory II (BDI-II) to measure changes in mood. Data from 55 completers was analysed using a one way repeated ANOVA. The results showed the changes in scores from both measures where statistically significant at post treatment and three month follow up compared to the pre-treatment scores with large effect sizes. This outcome rejected thenull hypothesis and showed that MEST was an effective and feasible adjunctwith CBT in improving memory specificity and mood more than was achieved in previous studies using MEST alone. Limitations of the study included, randomisation not fully blind, no independent therapists, low frequency of supervision for checking manual adherence, no SCID, short follow up period and reduced generalisability. Future research could repeat this study use group CBT as a control, participants from out-patient departments, larger sample size, improve blinding before random allocation, using SCID, frequentsupervision and use of independent therapists.

Keywords: *Cognitive Behavioural Therapy (CBT), Memory Specificity Training (MEST)*

Introduction

There is a need to continue the development or refinement of existing evidence based psychological interventions such as CBT for depression due to the relative stagnation in effectiveness of CBT and other psychosocial interventions for depression [1-5].

MEST is a new standalone psychological intervention, developed to target OGM's for moderate depression. The few studies done on MESTreduced OGM's and increased autobiographical memory specificity (AMS) leading to improved mood [10-12]. The first MEST study consisted of four group sessionsdelivered to moderately depressed Belgium in-patients, aged 32-55 that resulted in increased AMS and depressive symptom improvements. There was no-follow up, nocontrol or comparison group, the sample size of 10 had seven dropping out and all participants where female [10]

In the second MEST study, 23 Afghan adolescents based in Iran with moderate depression, were randomly assigned, 12 to the MEST group and 11 to the control group with a two months follow up. The MEST group retrieved a higher proportion of specific memories and lower levels of depression than did the control group [11]. In this study the benefits of MEST could have been confounded by subsequentimprovement in trauma experiences and hence a commensurate reduction in OGM's. The Impacts of events scale was not re-administered at post-treatment and follow up that would have helped to dismiss or confirm trauma

improvements as a possible confounding factor [13]. Trauma factors associated with OGM's will not be a focus of the research here.

The third MEST study recruited and randomly allocated 32 depressed out-patients, aged 27-56from Amsterdam to undergo originally four sessions of group MEST. Statistical analysis was done on 26 participants, the majority were women who attendedbetween four to five sessions. The results showed a decrease in depressive symptoms corresponding with an increase in AMS [12]. This study had no control group anda relatively small sample size. All the participants whose depressive symptoms were measured at a three-month follow-up had started apsychological or pharmacological treatment at the time of the follow-up. This makes it hard todistinguish whether further improvement of symptoms measured at follow-up was caused by MEST only.

A brief outline of the literature will now be given about identifying depression, impact OGM's has on depression, defining OGM's and AMS, the theoretical framework to explain how OGM's and AMS occur, the purpose for the research, significance and hypotheses.

Depression consists of low mood, loss of interest or reduced satisfaction, enjoyment in activities for at least a two week period, along with other symptoms causing distress and diminished functioning (American Psychiatric Association, 2013). Overgeneral autobiographical memories (OGM) [6-8], is strongly associated with making depression more severe, delays recovery and is a vulnerability factor for subsequent episodes of depression [9].

Overgeneral autobiographical memories (OGM) are modifiable [36] and can span over the whole day, consisting of a summary of several similar events such as (e.g., "watching my favourite TV show on Saturday evenings"). It may also be a memory of a general time period that spans more than one day and is called an extended memory (e.g., "My holiday in France last year" [8, 18]. Autobiographical specific memories (AMS) is defined as a memory for a specific occasion, event that can be important or trivial and the event that occurred is recent of at least one week or a longer time period, months, years ago but experienced then at a particular place and time that occurred within a 24 hour period [10, 19].

The main theoretical framework to understand OGM is based on the self-memory system [20], were autobiographical knowledge is arranged hierarchically along lifetime periods, from the abstract to concrete, from themes, periods, general events to event specific knowledge, the latter containing more sensory-perceptual affective details. OGM is viewed as a failure to progress to the lower more specific levels of memory during memory retrieval and remains at the more abstract, general level [8, 20] and relates to the lack of spatial-temporal specificity not the content of memory [21]. The most recent model to explain the mechanisms that lead to OGM in depression is from the capture and rumination, functional avoidance, executive control (CARFAX) model [8, 22]. This model postulates that difficulties accessing AMS result from the capture of memory search efforts by the bringing together of OGM's that causes or keeps the depression in place. Such capture operations are made worse by an established, embedded functional avoidance of specific details of distressing autobiographical events, which in turn leads to the processing of life experiences only at the categorical level or OGM's [8].

The research studies above suggested that reducing OGM's and increasing AMS could improve mood and MEST was developed to reduce OGM's and increase AMS with promising results [10-12]. The limitations in MEST studies suggest a larger sample size is required, from a different country, with bock randomisation to better control gender allocation and group balance. In addition two relatively recent studies recommended that future studies could use MEST as an adjunct with CBT [14, p.8; 11, p.7]. Guided by these gaps in research, the purpose of the study was to build upon and expand on the previous findings of MEST research by examining the effectiveness and feasibility of group CBT with MEST with moderately depressed adults from the United Kingdom [11, p.7; 14, p.8]. This study is significant as it would be the first study in the UK to do this as far as I am aware.

Hypothesis 1: There would be a difference in effect between pre-treatment, post-treatment and at three month follow up AMS scores as a result of group CBT with MEST for moderately depressed adults. Hypothesis 2: There would be a difference in effect between

pre-treatment, post-treatment and at three month follow up BDI-II scores as a result of group CBT with MEST for moderately depressed adults.

It is important to seek to improve outcomes [1-5] for moderately depressed adults that could further help to reduce social and economic burdens [15-17]. It could reduce suffering quicker for those who are depressed but also for their families as well and personally reduce health, social and economic care costs. This may be achieved by treating more depressed clients through groups than individual one to one treatment as in group CBT with MEST with specific clinical health benefits of increasing AMS to reduce vulnerability to recurrence of depression [8-9] and improved mood [10-12].

Method

Participants

Participants were 30 male and 30 female adults, aged 21-57 (M= 37.90; SD = 8.79), recruited from two London Boroughs in the United Kingdom whofulfilled the inclusion criteria and consented to treatment. The inclusion criteria stated that participants had to be aged between 20-60, presence of moderate symptoms defined as a Beck depression inventory (BDI-II) score of 20 or more but less than 29 [24] and AMS of less than 0.70 as assessed on the AMT [29]. The exclusion criteria included high levels of suicidality or harm to others as taken from BDI-II scores; secondary diagnosis of another affective disorder or a psychotic disorder; current drug/ alcohol abuse or dependence, personality disorder (assessed via participant report); presence of head trauma or organic brain damage (assessed via participant report); history of childhood abuse; PTSD symptoms, chronic pain, adjustment problem, primary problem is anxiety, poor grasp of the English language, reading and writing.

All were experiencing moderate depression as confirmed by the researcher and other experienced clinician using the DSM-5 major depression criteria [23] and scores based on the BDI-II [24]. The mean score on the BDI-II (M=25.92; SD = 1.07) suggested the group had moderate depression. Data from Raes et al [10] suggested a sample size of 22 (11 per group) would provide 80% power, with a directional alpha of .05, to detect a similar improvement in AMS.

Procedures

A treatment manual was developed for this research that contained the main CBT components, behavioural activation and cognitive reframing adhere to the Beckian cognitive model and Lewholm behavioural model [25-27]. These components have high validity and reliability as shown in numerous studies over the decades in being used to treat depression [5]. The MEST training protocols also has some degree of validity, reliability as demonstrated in theMEST studies that followed them [10-12]. The manual was also check by several highly experienced clinical psychologists who confirmed the manual developed contained the core components of CBT and broadly the MEST protocol.

Ethical approval was obtained then the research was advertised in two London boroughs. Prospective participants responded by e-mail to leaflets posted through the letterbox of people's homes, flyers posted on the advertisement boards in supermarkets, health clubs, local libraries, community centres, religious places of worship, several newsagents and charity shops. For each cohort there was a screening process, participants who scored 070 or less on the Autobiographical Memory Test and 20-28 on the BDI-II got interviewed to ensure they fulfilled the DSM 5 criteria for depression [23], met the inclusion and exclusion criteria, understood the contents of the participants information sheet and freely gave written consent and understood they could withdraw at any time without prejudice. They were then cluster randomised using a stratified randomisation procedure [28].

Sixty participants for each group were initially recruited, 55 for each group started and completed the treatment. The randomised controlled trial (RCT) was a 2 x 3 pre, post and three month-test follow-upwithin-subject design to compare the effectiveness of CBT with MEST. The group was balanced with equalnumbers of male and female participants for each of the six cohorts.

Measures

The Autobiographical Memory Test measures both OGM and AMS [29]. For example, ten cue-words (five positive and five negative), are provided in turn and participants then write down one AMS that the cue-word reminds them of within 30 or 60seconds. Instructions make it clear AMS refers to one particular occasion or event that happened on a particular day, within 24 hour period and at least one week before the test. Each response is coded as an AMS, a memory for an event, occasion that happened within a 24 hour period on a particular day, more than one week ago. OGM includes extended and categoric memory, were a repeated event or occasion is recalled without specifying any particular time or lasted longer than a 24 hour period or more than one day. The other is considered a verbal association to the cue rather than a memory and coded semantic and lastly no memory or response is given and coded an omission.

In this research, two parallel sets of 18 cue-words, nine positive and nine negative, similar to a previous MEST study [11] were matched for familiarity and emotionality using three independent raters [30] for pre-test, post and follow up.

The BDI-II is a 21-item self-report questionnaire used for measuring the severity of depression in adolescents and adults aged 13 and older. Each response relates to the recent two week period and for each question a score of 3, 2, 1, or 0 may be selected with total scores ranging from 0 to 63. The questions had been revised to correspond more with the DSM-IV criteria for depression. Total scores ranging from 0 to 13 represent normal to minimal depression; 14 to 19 is considered mild depression; 20 to 28 is seen as moderate and between 29 to 63 as severe or major. It has high reliability and capacity to discriminate between depressed and non-depressed subjects, concurrent, content, and structural validity and internal consistency gave a cronbach's alpha of 0.92 for outpatients and 0.93 for students [24, 31].

To help guarantee the integrity of each treatment, that the group manual was adhered to, two random audio recordings and two random in observations were made between session two to seven by an independent clinical psychologist. This was to check for manual adherence and bias in non-verbal presentation, none was found.

Statistical Analysis

In order to determine changes in memory specificity and low mood from pre-treatment to post-treatment and three month follow up, a one way repeated ANOVA with a pairwise comparison was run using SPSS 22 software, with the significance level was set at $p < .01$ with a confidence interval of 99%.

Results

Sample

Sixty participants were included in the group CBT with MEST intervention that received pre-treatment measures. Five of the participants did not start the intervention due to work commitment, starting treatment elsewhere, illness and carers responsibilities. Data on the 55 completers were used for data analysis, this equates to 8.3% of missing data in subsequent measures at post-treatment and three month follow up. Missing data was dealt with using the list wise default from the SPSS 22 [32] as the percentage of 8.3% of missing data does not compromise statistical analysis [33-34].

For group CBT with MEST the skewness and kurtosis scores were within plus or minus 2.58 at pre-treatment, post-treatment and three month follow up.; there was no outliers as no residuals $\geq \pm 3$ were obtained at pre-treatment and normal Q-Q plot of residuals, showed they are not too distorted from the diagonal line to suggest that the data did not violate the assumption of normality at pre-treatment.

The mauchley's test of sphericity indicated that the assumption of sphericity had been violated for AMS, (2) = 33.924, p = .001; and BDI-II, (2) = 8.745, p = .013. Epsilon ( ) was 0.679 as calculated according to Greenhouse and Geisser [35], and was used to correct the

one-way repeated measures ANOVA. The group intervention elicited statistically significant changes in AMS scores over time, $F(1.358, 78.332) = 3046.881$, $p < .001$, partial = .983.

Data are mean ± standard deviation, unless otherwise stated. There was an increase in AMS from 56.0 ± 2.6 at pre-intervention to 88 ± 3.3 at post-intervention, a statistically significant increase of 31.3 (99% CL, 29.4 to 33.2), $p < .001$. Data are mean ± standard deviation, unless otherwise stated. There was an increase in AMS from 56.0 ± 2.6 at pre-intervention to and 92 ± 2.6 at three month follow up, a statistically significant increase of 35.4 (99% CL, 33.8 to 36.7), $p < .001$.

Epsilon was 0.868, as calculated according to Greenhouse & Geisser [35] and was used to correct the one-way repeated measures ANOVA. The group intervention elicited statistically significant changes in BDI-II scores over time, $F(1.736, 93.741) = 3407.314$, $p < .001$, partial = .984.

Table 1. Baseline characteristics of group sample (n=60) at pre-treatment

Demographic Variables		Group N = %	Mean and SD
Gender	Male	30 = 50%	
	Female	30 = 50%	
Marital Status	Married	22 = 36.6%	
	Single	19 = 31.7%	
	Separated	13 = 21.7%	
	Divorced	6 = 10%	
Ethnicity	White	28 = 46.7%	
	Asian	13 = 21.7%	
	Caribbean	10 = 16.7%	
	African	7 = 11.7%	
	Other	2 = 3.3%	
Religion	C of E	22 = 36.7%	
	Catholic	21 = 35%	
	Muslim	8 = 13.3%	
	Hindu	5 = 8.3%	
	Other	4 = 6.7%	
Qualification	One or more	51 = 85%	
	None	9 = 15%	
Occupation	Employed	28 = 46.7%	
	Unemployed	32 = 53.3%	
Age		21-57 (M = 37.90, SD 8.79)	
AMS			(M=56.86, SD=2.64)
BDI-II			(M=25.92, SD=1.07)

Data are mean ± standard deviation, unless otherwise stated. There was a decrease in BDI-II scores from 26 ± 1.0 at pre-intervention to 13.3 ± 3.3 at post-intervention, a statistically significant decrease of 11.6(99% CL, 29.4 to 33.2), p <.001. Data are mean ± standard deviation, unless otherwise stated.

There was a decrease in BDI-II scores from 26 ± 1.0 at pre-intervention to 11.0 ± 1.3 at three month follow up a statistically significant decrease of 15.0 (99% CL, 12.2 to 15.7), p <.001.

Discussion

The statistical results support the effectiveness and feasibility of CBT with MEST in treating moderately depressed adults. It also further confirms that OGMs are modifiable [36] and has built on and expanded the research on MEST [10-12, 11, p.7; 14, p.8]. It is also clinically significant as the scores on the BDI-II indicated the participants were in remission at post-treatment and in recovery at three month follow up [24].

Hypothesis one predicted that there would be a difference in effect between pre-treatment, post-treatment and at three month follow up in AMS scores as a result of group CBT with MEST for moderately depressed adults. The results showed there was statistically significant difference at post-treatment and three month follow up. This result rejected the null hypothesis and supported thealternative hypothesis.

The addition of MEST to CBT appeared to enhance AMS as the scores in this study showed higher rates of improvement compared to previous studies using MEST alone [10-12]. AMS improvement in the first MEST study by Reas et al [10] increased by 0.28 by the end of treatment. In the second MEST study by Neshat et al it was by 0.32 at two months follow up [11] and in the third MEST study there was an improvement in AMS of0.18 in Eigenhuis et al study[12]. The CBT with MEST had by post-treatment showed that AMS had improved by 31.2 and at three month follow by 35.6 compared to pre-treatment.

Hypothesis two predicted that there would be a difference in effect between pre-treatment, post-treatment and at three month follow up BDI-II scores as a result of group CBT with MEST for moderately depressed adults. The results showed there was statistically significant difference at post-treatment and three month follow up. This result rejected the null hypothesis and supported the alternative hypothesis. It also supports previous studies that suggested that reducing OGM's and increasing AMS could improve moodand supports previous research that used MEST alone that improved mood [10-12].

Limitations include the way of presenting cues and/or available amount of time to respond to the AMT cue words are moderators of AMT performance [37]. Study was not fully blind; no independent therapists used to run the group, no SCID used; participants were highly motivated as evidenced by voluntary participation, high attendance rate, high homework compliance between both groups, factors not typical ofclinically depressed adults that attend out-patient clinics for CBT [38]. There is limited generalisability due to participants being solely depressed, not on anti-depressant medication and no co-morbidity. The researcher running the group interventions did not receive training to use the treatment manual for MEST with CBT although it was compiled by the researcher. This researcher also did not receive weekly supervision to check manual adherence [39] when running the groups. This was limited to a few random audio recordings and direct observations by an independent experienced clinician.

Conclusion

The findings of this study expanded the work of previous researchers in the area of MEST for depression [10-12]. These results go some way towards showing that CBT with MEST is not only feasible but is effective, cost effective due to being a group treatment, potentially may reduce one risk factor OGM's that is associated depression relapse and potentially allows others to get back to work quicker, lowering personal and government health costs. Future research could repeat this study by having a larger sample size; blind, using SCID, regular independent supervision for each deliverer of group intervention; using independent and different therapists to run the group intervention. Samples of participants recruited into a

randomised controlled trial that is seen at a typical out-patient clinic in comparing five sessions of MEST with five sessions of MEST with CBT and five sessions of standard group CBT as a control group to see any enhancing effect on the rate and amount of AMS improvement and BDI-II scores in moderately clinical depressed adult participant.

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Funding

This study was self-funded by the author.

Conflicts of Interests

There are no conflicts of interests for the author.

South American Journal of Psychology
Volume 1, Issue 1, 2016

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Abstract

Memory specificity training (MEST) alone can improve mood associated with depression as found in previous studies. The aim was to build upon and expand on previous MEST and self-distancing (SD) studies by testing the effectiveness and feasibility of seven treatment sessions with a three month follow up of group CBT with MEST and SD in moderately depressed adults in two London Boroughs. Method was to recruit 60 participants from advertisements and a screening process that included administration of questionnaires, the autobiographical memory test (AMT) and Beck depression inventory (BDI-II) and interviewed to confirm they met the inclusion and exclusion criteria, and met symptoms for depression as listed in the DSM-5. Consent was obtained and then block randomising done to ensure a balanced group. There were 55 participants who completed the treatment at all time points and their data and scores on the AMT and BDI-II was used when running a one way repeated ANOVA as this was a within group design with repeated measures, using SPSS 22. The results showed improvements occurred at post-treatment and three month follow up for AMS and BDI-II scores that was statistically significant with large effect sizes at post-treatment and three month follow up. Discussion, the null hypothesis was rejected and the alternative hypothesis was accepted. MEST with self-distancing is an effective and feasible adjunct with CBT in improving memory specificity and mood. Limitations included; the study was not fully blind, no independent therapist, low frequency of supervision for checking manual adherence, no SCID, short follow up period and reduced generalisability. Future research could repeat this study using group CBT as a control, participants recruited from out-patient departments, larger sample size, improve blinding before random allocation, using SCID, frequent supervision and use of an independent therapist.

Key words: Cognitive Behavioural Therapy, Memory Specificity Training, Self-Distancing.

Introduction

There is a need to continue the development or refinement of existing evidence based psychological interventions such as CBT for depression due to the relative stagnation in effectiveness of CBT and other psychosocial interventions for depression [1-5]. A promising treatment is memory specificity training (MEST) that was used alone for moderate depression that worked by reducing overgeneral memories (OGM's) and increasing specific memories (AMS), leading to improved mood [9-11]. Also interesting is a potential treatment technique called self- distancing (SD), were induction studies found participants experienced less distress and improved mood.

The first MEST study consisted of four group sessions delivered to moderately depressed Belgium in-patients, aged 32-55 that resulted in increased AMS and depressive symptom improvements. There was no-follow up, no control or comparison group, the sample size of 10 had seven dropping out and all participants where female [9].

In the second MEST study, 23 Afghan adolescents based in Iran with moderate depression, were randomly assigned, 12 to the MEST group and 11 to the control group with a two months follow up. The MEST group retrieved a higher proportion of specific memories and lower levels of depression than did the control group [10]. In this study the benefits of MEST could have been confounded by subsequent improvement in trauma experiences and hence a commensurate reduction in OGM's. The Impacts of events scale was not re-administered at

post-treatment and follow up that would have helped to dismiss or confirm trauma improvements as a possible confounding factor [18]. Trauma factors associated with OGM's will not be a focus of the research here.

The third MEST study recruited and randomly allocated 32 depressed out-patients, aged 27-56 from Amsterdam to undergo originally four sessions of group MEST. Statistical analysis was done on 26 participants, the majority were women who attended between four to five sessions. The results showed a decrease in depressive symptoms corresponding with an increase in AMS [11]. This study had no control group and a relatively small sample size. All the participants whose depressive symptoms were measured at a three-month follow-up had started a psychological or pharmacological treatment at the time of the follow-up. This makes it hard to distinguish whether further improvement of symptoms measured at follow-up was caused by MEST only.

The SD induction studies was utilised primarily in young non-clinically depressed participants [12-17]. Only one study induced SD on a depressed group with no extended follow up period nor used with any other psychological treatment [12]. In the latter study, they recruited 51 moderately depressed adults and 45 healthy adults without any history of depression in America. They then used cues to recall a past experience in which they felt overwhelming sadness and were randomly assigned to either adopt a self-immersed or a self-distanced perspective to neutral or depressotypic words and recorded the speed of responses. The depressed group that analysed their feelings from a self-distanced perspective showed lower levels of depressive thinking and reduced low mood than the self-immersed group. They suggested that future research on SD should examine whether these findings generalize to adults with depression under other conditions, which could be taken to also apply to treatment conditions[16].

A brief outline of the literature will now be given about identifying depression, impact OGM's has on depression, defining OGM's and AMS, the theoretical framework to explain how OGM's and AMS occur, distancing connection to reframing and AMS, the purpose for the research, significance and hypotheses.

Depression consists of low mood, loss of interest or reduced satisfaction, enjoyment in activities for at least a two week period, along with other symptoms causing distress and diminished functioning [31]. Overgeneral autobiographical memories (OGM) which is considered an avoidance strategy [6-7] are strongly associated with making depression more severe, delays recovery and is a vulnerability factor for subsequent episodes of depression [8].

Overgeneral autobiographical memories (OGM) are modifiable [8] and defined as including a summary of several similar events (e.g., "watching my favourite TV show on Saturday evenings") or a memory of a general time period that spans more than one day (e.g., "My holiday in France last year" [32, 7]. Autobiographical memory specificity (AMS) is defined as a memory for a specific occasion, event that occurred at least one week or longer at a particular place and time within a 24 hour period [9-10] thus relates to spatial-temporal specificity not the content of memory [33].

The main theoretical framework to understand OGM is based on the self-memory system model [20]. It suggests that knowledge is arranged hierarchically along lifetime stages that can be accessed through memories that range from the abstract to the concrete or general events to specific events [8, 20]. It is not the content of thought of the memory that matters but the degree of spatial-temporal specificity and arousing details that is recalled [21]. OGM's lacks spatial-temporal specificity and emotional arousal and AMS has more sensory-perceptual arousing details.

Another more recent model to explain the mechanisms that lead to OGM in depression is from the capture and rumination, functional avoidance, executive control (CaRFAX) model [8, 22]. This model hypothesize that difficulties accessing AMS result from the capture of memory search efforts by the bringing together of OGM's that causes or keeps the depression in place. This is made worse by avoidance of specific aspects of distressing autobiographical events that can become habitual, leading to processing of broader life experiences only at the level of OGM's [8] that can cause of keep the depression in place.

A distancing stance is required to enable reframing in CBT [20, 25] and distancing is an important component in mindfulness for depression [21], both CBT and mindfulness are linked to increasing AMS [22-24]. It is reasonable to assume the distancing element in SD may also help to enhance AMS and may help with facilitating specific re-appraisal as is necessary in CBT [25].

The distancing component of SD, means taking a mental step back. This stance permits a broader context to be observed at a distance when recalling or retrieving past experiences which facilitates the second component of SD, reconstruing. The distancing component may permit flexibility and modification to occur to allow new explanation, understanding, meaning, insights that could reduce current and future distress [13-16].

The research studies above suggested that reducing OGM's and increasing AMS could improve mood and MEST was developed to reduce OGM's and increase AMS with promising results [10-12]. The limitations in MEST studies suggest a larger sample size is required, from a different country, with bock randomisation to better control gender allocation and group balance. In addition two relatively recent studies recommended that future studies could use MEST as an adjunct with CBT [14, p.8; 11, p.7]. Another gap in research is that SD could be used with depressed adults under others conditions. Here it could be under treatment conditions such as with CBT with MEST [16].

The purpose of the study was to build and expand on the previous research on MEST and SD. This was done by examining the effectiveness and feasibility of group CBT with MEST and SD using AMS and low mood measures in moderately depressed adults from London, UK, under pre-treatment, post-treatment and three month follow up conditions.

Hypothesis 1: There would be a difference in the total score for AMS by moderately depressed adults by post- treatment and three month follow up conditions as a result of group CBT with MEST and SD. Hypothesis 2: There would be a difference in the total score on the BDI-II by moderately depressed adults by post- treatment and three month follow up conditions as a result of group CBT with MEST and SD.

It is important to seek to improve outcomes [1-5] for moderately depressed adults that could further help to reduce social and economic burdens [28-30]. It could reduce suffering quicker for those who are depressed but also for their families as well and personally reduce health, social and economic care costs. This may be achieved by treating more depressed clients through groups than individual one to one treatment as in group CBT with MEST and SD with specific clinical health benefits of increasing AMS to reduce vulnerability to recurrence of depression [7-8] and improved mood [9-11].

Method

Participants

Participants were 30 male and 30 female adults, aged 24-56 (M= 36.92; SD = 9.28), recruited from two London Boroughs fulfilled the inclusion and exclusion criteria and consented to treatment. The inclusion criteria stated that participants had to be aged between 20-60, presence of moderate symptoms defined as a Beck depression inventory (BDI-II) score of 20 or more but less than 29 [38] and AMS of less than 0.70 as assessed on the AMT [42]. The exclusion criteria included high levels of suicidality or harm to others as taken from BDI-II scores; secondary diagnosis of another affective disorder or a psychotic disorder; current drug/ alcohol abuse or dependence, personality disorder (assessed via participant report); presence of head trauma or organic brain damage (assessed via participant report); history of childhood abuse; PTSD symptoms, chronic pain, adjustment problem, primary problem is anxiety, poor grasp of the English language, reading and writing.

All were experiencing moderate depression as confirmed by the researcher and other experienced clinician using the DSM-5 major depression criteria [31] and scores based on the BDI-II [38]. The mean score on the BDI-II (M=26.23; SD = 1.15) suggested the group had moderate depression.

Data from Raes et al [9] suggested a sample size of 22 (11 per group) would provide 80% power, with a directional alpha of .05, to detect a similar improvement in AMS. The sample

size had to be larger than 11 per group as a requirement of 36 or more for each treatment group was needed to achieve medium effect sizes averaging d= 0.51 in previous research on self-distancing [12-13].

Procedure

A manual was compiled for the study, the CBT components consisted of behavioural activation and cognitive reframing that adhered to the Beckian cognitive model and Lewholm behavioural model [25, 39-40]. Both have validity and reliability when used to treat depression [5]. MEST training has some degree of validity, reliability [9-11]. A similar format was used but spread over seven sessions instead of five due to having to accommodate the CBT components and the self-distancing technique. The self-distancing technique that was used has some degree of validity [12-17]. The manual was also checked by several highly experienced clinical psychologists who confirmed the manual developed contained the core components of CBT and broadly the MEST protocol whereas a SD protocol they could only confer face validity.

Ethical approval was obtained then the research was advertised in two London boroughs. Prospective participants responded by e-mail to leaflets posted through the letterbox of people's homes, flyers posted on the advertisement boards in supermarkets, health clubs, local libraries, community centres, religious places of worship, several newsagents and charity shops. Those who responded to the advert where invited to a screening session to assess for treatment suitability.

Participants were then screened using the autobiographical memory test (AMT) and Beck depression Inventory (BDI-II). They were then interviewed to ensure they met the inclusion criteria and had symptoms of depression as listed in the DSM-5 [31]. Consent was obtained when it was satisfied they fully understood the contents of the participants information sheet and understood they could withdraw at any time without prejudice. They were then cluster randomised using a stratified randomisation procedure [41] to ensure a balanced gender group. Those not selected where sent a letter thanking them for attending and wishing them well. A total of 60 participants were recruited this way, five did not start treatment, with 55 completers.

A within subject design was selected. The within group factors, included pre-treatment, post-treatment and three month follow up to examine the effectiveness of group CBT with MEST and SD.

To help guarantee the integrity of each treatment, that the group manual was adhered to, a two random audio recordings and two random in observations were made between session two to seven by an independent clinical psychologist. This was to check for manual adherence and bias in non-verbal presentation, none was found.

Measures

The Autobiographical Memory Test measures both OGM and AMS [42] with a reliability estimate of 0.72 [53]. For example, ten cue-words (five positive and five negative), are provided in turn and participants then write down one AMS that the cue-word reminds them of within 30 or 60seconds. Instructions make it clear AMS refers to one particular occasion or event that happened on a particular day, within 24 hour period and at least one week before the test. Each response is coded as an AMS, a memory for an event, occasion that happened within a 24 hour period on a particular day, more than one week ago. OGM includes extended and categoric memory, were a repeated event or occasion is recalled without specifying any particular time or lasted longer than a 24 hour period or more than one day. The other is considered a verbal association to the cue rather than a memory and coded semantic and lastly no memory or response is given and coded an omission.

In this research, two parallel sets of 18 cue-words, nine positive and nine negative, similar to a previous MEST study [10] were matched for familiarity and emotionality using three independent raters [43] for pre-test, post and follow up.

The BDI-II is a 21-item self-report questionnaire used for measuring the severity of depression in adolescents and adults aged 13 and older. Each response relates to the recent

two week period and for each question a score of 3, 2, 1, or 0 may be selected with total scores ranging from 0 to 63. The questions had been revised to correspond more with the DSM-IV criteria for depression. Total scores ranging from 0 to 13 represent normal to minimal depression; 14 to 19 is considered mild depression; 20 to 28 is seen as moderate and between 29 to 63 as severe or major. It has high reliability and capacity to discriminate between depressed and non-depressed subjects, concurrent, content, and structural validity and internal consistency gave a cronbach's alpha of 0.92 for outpatients and 0.93 for students [39, 44].

Statistical Analysis

In order to determine changes in memory specificity and low mood from pre-treatment to post-treatment and three month follow up, using SPSS 22, a one way repeated ANOVA with a pairwise comparison was run. The statistical significance level for the two hypotheses was set at .01 with a confidence level of 99% for all statistical tests. Effect sizes are indicated in terms of both partial η^2 and reported as significant at $p<.001$.

Results

Sample

Sixty participants were included in the group CBT with MEST intervention that received pre-treatment measures. Five of the participants did not start the intervention due to work commitment, starting treatment elsewhere, illness and carers responsibilities.

Data on the 55 completers were used for data analysis, this equates to 8.3% of missing data in subsequent measures at post-treatment and three month follow up. Missing data was dealt with using the listwise default from the SPSS 22 [45] as the percentage of 8.3% of missing data does not compromise statistical analysis [46-47].

The skewness and kurtosis scores were within plus or minus2.58 at pre-treatment, post-treatment and three month follow up.; there was no outliers as no residuals $\geq \pm 3$ were obtained at pre-treatment and normal Q-Q plot of residuals, showed they are not too distorted from the diagonal line to suggest that the data did not violate the assumption of normality.

The mauchly's test of sphericity indicated that the assumption of sphericity had been violated for AMS, (2) = 39.102, p = .001; and BDI-II, (2) = 17.360, p = .001. Epsilon was 0.667 as calculated according to Greenhouse & Geisser [48], and was used to correct the one-way repeated measures ANOVA. The group intervention elicited statistically significant changes in AMS scores over time, F(1.314, 70.968) = 480.490, p < .001, partial = .989.

Table 1. Baseline characteristics of group sample (n=60) at pre-treatment

Demographic Variables	Category	Group N = %	Mean and SD
Gender	Male	30 = 50%	
	Female	30 = 50%	
Marital Status	Married	23 = 38.3%	
	Single	15 = 25%	
	Separated	12 = 20%	
	Divorced	10 = 16.7%	
6 Ethnicity	White	30 = 50%	
	Asian	14 = 23.3%	
	Caribbean	9 = 15%	
	African	4 = 6.7%	
	Other	3 = 5%	

Religion	C of E	22 = 36.7%	
	Catholic	19 = 31.37%	
	Muslim	11 = 18.3%	
	Hindu	4 = 6.7%	
	Other	4 = 6.7%	
Qualification	One or more	55 = 91.7%	
	None	5 = 8.3%	
Occupation	Employed	31 = 51.7%	
	Unemployed	29 = 48.3%	
Age		24-56 (M = 36.92, SD=9.28)	
AMS			(M=56.65, SD=3.03)
BDI-II			(M=26.23, SD=1.15)

Data are mean ± standard deviation, unless otherwise stated. There was an increase in AMS from 56.6 ± 3.0 at pre-intervention to 91.3 ± 2.3 at post-intervention, a statistically significant increase of 34.6 (99% CL, 33.0 to 36.2), p <.001. Data are mean ± standard deviation, unless otherwise stated.

There was an increase in AMS from 56.0 ± 2.6 at pre-intervention to 96.3 ± 2.3 at three month follow up, a statistically significant increase of 39.7 (99% CL, 38.1 to 41.3), p <.001. Epsilon (ε) was 0.782, as calculated according to Greenhouse & Geisser [48], and was used to correct the one-way repeated measures ANOVA. The group intervention elicited statistically significant changes in BDI-II scores over time, F(1.563, 84.420) = 4536.820, p <.001, partial eta squared = .988.

Data are mean ± standard deviation, unless otherwise stated. There was a decrease in BDI-II scores from 26.3 ± 1.2 at pre-intervention to 7.9 ± 1.3 at post-intervention, a statistically significant decrease of 18.3 (99% CL, 17.5 to 19.1), p <.001. Data are mean ± standard deviation, unless otherwise stated. There was a decrease in BDI-II scores from 26.3 ± 1.2 at pre-intervention to 3.8 ± 1.7 at three month follow up a statistically significant decrease of 22.5 (99% CL, 21.6 to 23.5), p <.001.

Discussion

The statistical results support the effectiveness and feasibility of CBT with MEST and SD in treating moderately depressed adults. It also further confirms that OGMs are modifiable [8] and has built on and expanded the research on MEST [10-12, 11, p.7; 14, p.8] and SD [12]. It is also clinically significant as the scores on the BDI-II indicated the participants were in remission at post-treatment and in recovery at three month follow up [39].

Hypothesis one predicted that there would be a difference in effect between pre-treatment, post-treatment and at three month follow up in AMS scores as a result of group CBT with MEST and SD for moderately depressed adults. The results showed there was statistically significant difference at post-treatment and three month follow up. This result rejected the null hypothesis and supported the alternative hypothesis.

The addition of MEST and SD to CBT appeared to enhance AMS as the scores in this study showed higher rates of improvement compared to previous studies using MEST alone [10-12]. AMS improvement in the first MEST study by Raes et al [9] increased by 0.28 by the end of treatment. In the second MEST study by Neshat et al it was by 0.32 at two months follow up [10] and in the third MEST study there was an improvement in AMS of 0.18 in Eigenhuis et al study[11]. The CBT with MEST and SD had by post-treatment showed that

AMS had improved by 34.5 and at three month follow by 39.9 compared to pre-treatment. The result also challenges the research that asserted that taking an analytical focus as found in SD may not reduce OGM [49] found in depression.

Hypothesis two predicted that there would be a difference in effect between pre-treatment, post-treatment and at three month follow up in BDI-II scores as a result of group CBT with MEST and SD for moderately depressed adults. The results showed there was statistically significant difference at post-treatment and three month follow up. This result rejected the null hypothesis and supported the alternative hypothesis.

There is support that the MEST element did contribute to improved mood through increasing AMS, supporting previous research that used MEST alone for adult moderate depression that it can improve mood [9-11]. This may also be due to SD helping to make it easier to re-appraisal and interpret one's experience or 'reconstrue' [13, 26] helping to increase AMS scores.

Limitations include the way of presenting cues and/or available amount of time to respond to the AMT cue words are moderators of AMT performance [50]. Study was not fully blind; no independent therapists used to run groups, no SCID used; participants were highly motivated as evidenced by voluntary participation, high attendance rate and high homework compliance factors not typical of clinically depressed adults that attend out-patient clinics for CBT [51]. There is reduced generalisability due to participants being solely depressed, not on anti-depressant medication and no co-morbidity. The researcher running the group intervention did not receive training to use the treatment manual, did not receive weekly supervision to check manual adherence [52] when running the groups. This was limited to a few random audio recordings and direct observations by an independent experienced clinician.

Conclusion

The findings of this study expanded the work of previous researchers in the area of MEST for depression [9-11] and SD [12-17, 19]. These results go some way towards showing that CBT with MEST and SD is not only feasible but is effective, ''scalable'', cost effective due to being a group treatment, potentially may reduce one risk factor OGM's that is associated depression relapse and potentially allows others to get back to work quicker, lowering personal and government health costs.

Future research can repeat this study by having a larger sample size; blind, using SCID, regular independent supervision for the deliverer of group intervention; using independent therapist to run the group intervention. Samples of participants recruited into a randomised controlled trial that is seen at a typical out-patient clinic in comparing five sessions of MEST with five sessions of group CBT with MEST and SD and five sessions of standard group CBT as a control group to see any enhancing effect on the rate and amount of AMS and mood changes in moderately clinical depressed adult participants.

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Funding

This study was self-funded by the author.

Conflict of Interest

There are no conflicts of interest for the author.

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