RUNNING HEAD: VIOLENT OFFENDER TREATMENT OUTCOMES

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The impact of an intensive inpatient violent offender treatment programme on intermediary treatment targets, violence risk and aggressive behaviour in a sample of mentally disordered offenders

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Abstract

This study examined the impact of an intensive inpatient violent offender treatment programme, Life Minus Violence - Enhanced (LMV- E, Ireland, 2008), on intermediary treatment targets, risk for violence, and aggressive behaviour during treatment in a sample of male mentally disordered offenders. Using quasi-experimental design, offenders who completed LMV-E and a comparison group showed reduced problems with impulsivity and anger regulation and improvements in social problem solving. Aggregate risk for future violence lessened in both treatment and comparison groups, although by a significantly greater degree for the comparison group. The aggressive behaviour of both groups reduced. Completion of the LMV-E conferred additional improvements in some facets of social problem solving and anger regulation. Neither group showed improvements in empathic responses, coping skills or problematic interpersonal style. Overall, these results suggest anger regulation, impulsivity and social problem solving are most amenable to change, that reductions in certain facets of these dynamic risk factors transpires with nonspecific psychiatric inpatient treatment, but that the LMV-E, a cognitive behavioural violence specific psychological treatment, confers greater change in some facets of social problem solving and anger regulation.

Key words: Violence, Offender, Treatment Evaluation, Rehabilitation; Forensic Psychiatric Inpatients

Introduction

Aggression and violence have significant adverse health, social and economic impacts (World Health Organisation, 2014). There is a small group of persistently violent offenders, some of whom experience serious mental illness (SMI), who are responsible for a significant and disproportionate number of violent incidents. These people are often incarcerated or hospitalised for the purpose of incapacitation and rehabilitation. Releasing authorities including parole boards and mental health review tribunals typically require these violent offenders complete violent offender treatment programmes prior to release. However, the effectiveness of these programmes is uncertain, particularly in offenders with SMI; there are very few studies with adequate comparison groups that evaluate the effectiveness of these programmes and the mechanism of change leading to desistence is unclear. This study examined the impact of an intensive group-based inpatient violent offender treatment programme, Life Minus Violence-Enhanced (LMV- E, Ireland, 2008), on intermediary treatment targets (i.e., dynamic risk factors), risk for future violence, and aggressive behaviour during treatment, in a sample of male mentally disordered offenders.

Violent offender treatment effectiveness

There are very few violent offender treatment effectiveness studies pertaining to offenders with SMI (Ramplin et al., 2016). However, there are some studies exploring treatment outcomes for violent offenders without SMI. These studies are relevant to the treatment of violent offenders with SMI because violent offenders with and without SMI share similar dynamic risk factors (Bonta, Law & Hanson, 1998); as such, outcomes for these programmes, are briefly reviewed here to provide insight into the potential for

treatment change in violent offenders with SMI. A review of interventions for violent offenders with SMI is also presented.

The oft cited meta-analytic review by Dowden and Andrews (2000) explored whether offender rehabilitation programmes adhering to *Risk, Need and Responsivity* (RNR) principles were effective in reducing violent recidivism in miscellaneous offender populations; results revealed a mildly positive mean effect size of +.07 with variability from -.22 - +.63. Subsequently, Polaschek and Collie (2004) explored the effectiveness of nine violent offender treatment programmes and concluded that most showed some positive impact. The only meta-analysis exploring outcomes for violent offender treatment programmes (Jolliffe & Farrington, 2007) included studies of adult male violent offenders in treatments that were compared with one or more interventions with one or more control conditions including 'no treatment', 'treatment as usual', and 'placebo treatment' conditions. Studies ranged from small-scale evaluations of an anger management programme comprising 12 weekly two-hour sessions (Hughes, 1993) to a small (n=22) but intensive (330 hours) multi-module intervention for high-risk violent offenders in a residential treatment programme (Polaschek, Wilson, Townsend & Daly, 2005). Only eight of the studies included in the Jolliffe and Farrington (2007) meta-analysis reported on violent re-offending; of these, two reported a statistically significant reduction in violent re-offending, two showed a reduction that was not statistically significant, and two showed an increase in violent offending. Combined, the results suggested a statistically significant reduction in violent reoffending of about 7-8%. Since the publication of this meta-analysis several other violent offender treatment evaluations have been conducted; some have revealed positive impacts on violence (Cortoni, Nunes,

& Latendresse, 2006; Polaschek, 2011a), whereas others have revealed no significant impact (DiPlacido, Simon, Witte, Gu & Wong, 2006; Serin, Gobeil, & Preston, 2009; Wong et al., 2007).

There are only a few well-controlled evaluations of violent offender treatments in forensic mental health settings and no evaluations of the type of multi-module intensive group based treatments that are now relatively common in correctional settings (Polaschek, 2011). Haddock, Barrowclough, Shaw, Dunn, Novaco and Tarrier (2009) conducted a Randomised Controlled Trial for patients with schizophrenia. They compared individual Cognitive Behavioural Therapy (CBT) (motivational strategies to aid engagement, CBT strategies to reduce the severity and distress of psychotic symptoms, and CBT strategies to reduce the severity of anger linked to aggression and violence), versus social activity (intervention directed at assisting participants to identify activities they enjoyed and helping them participate in these activities). Results revealed improved outcomes for patients who participated in CBT with regard to verbal and physical aggression during treatment and at follow up. However, another study of CBT in patients with personality disorder (PD) revealed no difference in subsequent aggression compared to usual treatment (Davidson et al., 2009).

Other studies in forensic mental health settings have explored Schema Focussed Therapy; these have revealed positive but non-significant impacts on risk for recidivism (Bernstein, Nijman, Karos, Keulen-de Vos, de Vogel, & Lucker, 2012), another had no impact (Doyle, Tarrier, Shaw, Dunn, & Dolan, 2016). Evaluations of Aggression Replacement Training have produced positive impacts on aggression and self-reported anger (Zwets, Hornsveld, Muris, Kanters, Langstraat, & van Marle, 2016), as have

evaluations of the cognitive skills programme Reasoning and Rehabilitation, in terms of improvement in attitudes towards violence (Young, Gudjonsson, & Chick, 2010), and reduction in violent behaviour (Cullen, Clarke, Kuipers, Hodgins, Dean & Fahy, 2012). These studies are limited because most comprise small participant populations and is unclear whether all participants have a history of violent offending, most participants in these studies were noted to be diagnosed with PD rather than SMI (e.g., Bernstein et al., 2012; Davidson et al., 2009; Doyle et al., 2016) or the participants were predominantly diagnosed with PD (Zwets et al., 2016). Finally, as noted above, none have evaluated the sort of multi-modal interventions that are now (relatively) common in criminal justice services and seen as necessary for high-risk violent offenders with multiple needs and internal responsivity issues (Polaschek, 2011).

Mechanisms of change - dynamic risk factors

A key issue in violent offender treatment is illumination of the mechanisms of change in violence propensity. Understanding the mechanism of change is critical to determining the appropriate focus and the necessary features of treatment. Although criticised (Ward & Beech, 2014), the dominant model of offender rehabilitation, the Psychology of Criminal Conduct (Andrews & Bonta, 2010), which emphasises RNR principles, suggests that reduction in the propensity for violent behaviour occurs through a lessening in the strength of dynamic risk factors (Serin & Lloyd, 2009). This is consistent with findings that cognitive-behavioural programs conforming to RNR principles typically achieve higher-than-average effects in violent offender treatment outcome studies (Polaschek, 2011b). Targeting dynamic risk factors in treatment is therefore the critical strategy in contemporary violence treatment programmes. Although

violent offenders with SMI may have additional treatment needs and some unique risk factors (e.g., symptoms of major mental illness) that also impact treatment responsivity, dynamic risk factors are a critical focus of assessment and treatment for violent offenders.

Douglas and Skeem (2005) suggest that dynamic risk factors are: (1) antecedent to, and increase the propensity for, violence, (2) changeable, and, (3) predict changes in violent re-offending as a result of treatment. Many widely used structured violence risk assessment instruments comprise well-known dynamic risk factors (e.g., Historical-Clinical-Risk Management-20 version 3, HCR-20^{v3}, Douglas, Hart, Webster & Belfrage, 2013; Violence Risk Scale, VRS , Wong & Gordon, 2003) and many of these dynamic risk factors are associated with violent recidivism, thereby satisfying Douglas and Skeem's (2005) first criteria; however, there is (1) little evidence that many of these dynamic risk factors can change in violent offenders (either over time or as a consequence of treatment), and (2) little research that has examined whether changes in dynamic risk factors are associated with reductions in violent re-offending following release from custody (Klepfisz, Daffern & Day, 2015). There is some support for the proposition that intra-individual change in dynamic risk factors is associated with reduced reoffending in prisoners (Serin, Lloyd, Helmus, Derkzen & Luong, 2013), and there is also evidence that reduction in aggregate dynamic risk factors measured using multi-item structured violence risk assessment instruments is associated with reduced violent recidivism in populations with SMI (De Vries Robbé, de Vogel, Douglas & Nijman, 2015; Lewis, Olver & Wong, 2012).

Study aim

Overall, the absence of definitive high quality studies exploring violent offender treatment effectiveness prohibits confident assertions concerning treatment programme effectiveness for violent offenders with mental disorders and SMI. Furthermore, there is no evaluation of intensive group based multi-module violence offender treatment in a forensic mental health setting. Against this background, this study compared the effectiveness, through quasi-experimental methodological design, of an intensive inpatient violent offender treatment programme, Life Minus Violence - Enhanced (LMV-E, Ireland, 2008). Change in intermediary outcomes (i.e., purported dynamic risk factors including impulsivity, coping, cognitive and emotional empathy, anger expression and control, readiness to change, beliefs about aggression, social problem solving, and hostile and dominant interpersonal styles), aggregate risk (as measured by a multi-item structured professional judgement risk assessment instrument, the Historical Clinical Risk – 20^{v2}, Webster, Douglas, Eaves, Hart, 1997) and aggressive behaviour during treatment, were examined in a group of violent offenders with mental disorder (most with SMI) who completed treatment and compared with a sample of violent offenders with mental disorder (most with SMI) who did not receive psychological treatment addressing their violent behaviour.

Method

Setting

The study took place in a mental health hospital in England that provides treatment under conditions of high security for mentally disordered male patients who pose a grave danger to the public. All patients are detained under the Mental Health Act

(2007). The inpatient population numbers approximately 200 and the mean length of inpatient stay is approximately six years.

Participants

All study participants were male inpatients with a history of interpersonal violence as identified by their Responsible Clinician (RC) through review of official criminal records, file information and patient interview. RCs referred patients to the LMV-E programme (inclusion criteria were: a history of interpersonal violence and not actively psychotic, not cognitively impaired as determined by the RC, or not in complete denial of their aggressive behaviour) and identified comparison participants (patients who met the inclusion criteria for LMV-E but were unable to participate due to limited availability of treatment places - these patients may have been referred for future LMV-E treatment when available). Treatment participants were invited to participate in the research on entry to the LMV-E programme. Following their referral by the RC, the comparison participants were recruited to the study by research assistants (RAs). While comparison participants did not receive specific treatment for violence and aggression during the period of study, they were resident in a mental health hospital throughout that period and are likely to have received psychological and psychiatric treatment for mental health and/or personality problems. The specifics of the treatment that the comparison group received were not recorded. Inpatients requiring high levels of support (i.e. residents on high dependency wards or neuro-rehabilitation wards) were excluded, and patients with a history that included untreated sexual offences were required to undergo an alternate sex offender treatment programme.

The LMV-E treatment group comprised 33 patients with a mean age of 36.3 years

(range: 22 – 56 years). Of the 33 participants in the LMV group, 28 were white, two described themselves as mixed white and black African, one was mixed white and Asian, one was black Caribbean, and one was Asian. Nineteen patients had a primary diagnosis of Paranoid Schizophrenia and 14 patients had a dual diagnosis of Paranoid Schizophrenia and Personality Disorder (PD) (six with Antisocial PD, three with Antisocial and Emotionally Unstable PD, four with unspecified PD, and one with Emotionally Unstable PD). The comparison group comprised 42 patients with a mean age of 37.8 years (range: 23 – 66 years); 38 were white, one was mixed white and black African, two were black African and one was black Caribbean. Twenty-three of the comparison group patients had a primary diagnosis of Paranoid Schizophrenia, three with Schizoaffective Disorder, four with PD (two with Antisocial PD, one with Emotionally Unstable PD and one with unspecified PD), and one with Unspecified Nonorganic Psychosis. Ten patients had a dual diagnosis of Paranoid Schizophrenia and PD (three with Antisocial PD, three with Antisocial and Emotionally Unstable PD, one with Antisocial and Paranoid PD, one with Antisocial PD and two with unspecified PD. One patient had a dual diagnosis of Schizoaffective Disorder and Emotionally Unstable PD.

Measures

Assessment measures included clinician rated and self-report instruments.

Clinician rated measures

HCR-20 – Historical, Clinical and Risk Management Guide (Webster et al, 1997).

The HCR-20 is a widely used structured clinical rating guide comprising static and dynamic risk factors designed to assess risk of future violence. These 20 factors include

the individual's past History (H), which includes static risk factors, and dynamic risk factors reflecting current Clinical presentation (C) and future Risk (R). Each item is rated for its presence on a three-point scale, 0 (not present), 1 (possibly present), or 2 (definitely present). Although it is a structured professional judgement risk assessment instrument and clinicians are discouraged from summing individual item scores to produce a total score, for research purposes a total sore may be calculated. The predictive validity of the HCR-20 has been demonstrated in numerous studies (Douglas, Ogloff, Nicholls, & Grant, 1999; Gray, Fitzgerald, Taylor, MacCulloch, & Snowden, 2007; for review see Douglas, Shaffer, Blanchard, Guy, Reeves, & Weir, 2002-2016).

Psychopathy Checklist-Screening Version (PCL-SV: Hart, Cox & Hare, 1995).

The PCL-SV is a 12-item rating scale based on, and highly correlated with, the Psychopathy Checklist-Revised (PCL-R; Hare, 1991). It measures the extent to which an individual has characteristics of the psychopathic personality with each item rated on a 3-point scale according to the lifetime presence and severity of the symptom it is intended to assess 0 (absent), 1 (possibly or partially present), and 2 (present). It is a reliable measure (Guy & Douglas, 2006) with adequate internal consistency (Hart, Hare & Forth, 1994), and scores has been shown to be positively associated with aggression towards others (e.g., Douglas, Strand, Belfrage, Fransson, & Levander, 2005).

Chart of Interpersonal Reactions in Closed Living Environments (CIRCLE, Blackburn & Glasgow, 2006).

CIRCLE is a 51-item observational scale that assesses an individual's interpersonal style as it is exhibited within an institutional context across eight domains (Dominant, Coercive, Hostile, Withdrawn, Submissive, Compliant, Nurturant and Gregarious). Each

item is rated on a four-point Likert scale and scored 0 (not at all), 1 (occasionally), 2 (fairly often), or 3 (usually or frequently) by two staff who know the person well, their scores are combined to form the overall score. CIRCLE has satisfactory psychometric properties (Blackburn, 1998) with good inter-rater reliability (range 0.55–0.68) and test retest reliability (0.83–0.92) (Blackburn & Renwick, 1996). In this study comparisons over time were only made on the Coercion, Hostility and Dominance subscales because prior research has consistently revealed positive associations between these scales and aggressive behaviour in mentally disordered offenders (Daffern, Duggan, Huband & Thomas, 2008).

Self report questionnaires.

The Barratt Impulsiveness Scale – version 2 (BIS-II, Barratt, 1994).

BIS-II assesses impulsiveness. It is composed of 30 items describing common impulsive or non-impulsive (for reverse scored items) behaviors and preferences. Items are scored on a 4-point scale: 1 (Rarely/Never), 2 (Occasionally), 3 (Often), and 4 (Almost Always/Always). Internal consistency (0.83) is good (Stanford, Mathias, Dougherty, Lake, Anderson & Patton, 2009). For this study two items were removed because they were deemed unsuitable for a detained sample (i.e. 'I change where I live' and 'I plan for job insecurity').

Interpersonal Reactivity Index (IRI, Davis, 1983).

The IRI is a 28-item measure of cognitive and emotional empathy comprising four subscales with seven questions: Perspective Taking (the tendency to spontaneously adopt the psychological point of view of others), Fantasy (the tendency to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and

plays), Empathic Concern (assesses "other-oriented" feelings of sympathy and concern for unfortunate others), and Personal Distress (which measures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings). Each item is answered on a 5-point Likert scale ranging from 1 (Does not describe me well") to 5(Describes me very well). Internal consistency is reported as acceptable, ranging from .70 to .78 (Davis, 1994).

Novaco Anger Scale and Provocation Inventory (NAS-PI, Novaco, 2003).

NAS comprises two parts: Part A, which contains 60 items measuring the Cognitive, Arousal, and Behavioural domains of anger, and Part B, which provides an index of anger intensity and generality across five provocation categories: Disrespectful Treatment, Unfairness/Injustice, Frustration/Interruption, Annoying Traits and Irritations. The NAS-PI produces the following scores: Total (a general inclination toward anger reactions, based on Cognitive, Arousal and Behaviour subscales), Cognitive (anger justification, rumination, hostile attitude and suspicion), Arousal (anger intensity, duration, somatic tension and irritability), Behaviour (impulsive reaction, verbal aggression, physical confrontation and indirect expression), and Anger Regulation (the ability to regulate anger-engendering thoughts, effect self-calming, and engage in constructive behaviour when provoked). The Provocation Inventory comprises a Total score (PI Total), which reflects the five aforementioned five content areas. Novaco and Taylor (2004) reported excellent internal consistency coefficients for the NAS Total and PI Total, .92, and .92 respectively.

Social Problem-Solving Inventory-Revised (SPSI-R, D'Zurilla, Nezu,. & Maydeu-Olivares, 2002).

SPSI-R is a 52 item measure assessing an individual's problem-solving style and ability to generate solutions; it comprises the following component scales and subscales: Positive Problem Orientation (PPO), Negative Problem Orientation (NPO), Impulsivity-Carelessness Style (ICS), Avoidance Style (AS) and Rational Problem Solving (RPS), which includes the following subscales: Generation Of Alternative Solutions (GAS) Total, Decision Making (DM) Total, and the Solution Implementation and Verification Total (SI). Respondents rate each item on a 5-point Likert scale, ranging from 0 (Not at all true of me), 1 (Slightly true of me), 2 (Moderately true of me), 3 (Very true of me), 4 (Extremely true of me). Internal consistency is adequate to excellent for the subscales, ranging from .73 -.95 (Wakeling, 2007).

State Trait Anger Expression Inventory II (STAXI-2, Spielberger, 1999).

STAXI-2 comprises six scales measuring the intensity of anger and the disposition to experience angry feelings: State-Anger, Trait Anger, and Anger Expression and Anger Control, which assess four relatively independent anger-related traits: Anger Expression/Out, Anger Expression/In, Anger Control/In and Anger Control/Out. Each scale consists of items that are scored on four-point scales. STAXI-2 differentiates people with anger-related problems as compared with those without anger problems (Spielberger, 1999). Internal consistencies of the subscales are adequate and range from .69 to .86 (Eckhardt, Samper, & Murphy, 2008).

URICA (DiClemente & Hughes, 1990).

URICA is a 32-item self-report measure comprising four subscales measuring the

stages of change: Precontemplation (PC), Contemplation (C), Action (A), and Maintenance (M). The subscales can be summed (C + A + M – PC) to yield a second-order continuous Readiness to Change score. In this study the URICA Readiness to Change score was calculated pre- and post-treatment to explore whether changes in readiness occurred over the duration of treatment. Each item is scored on a five point Likert scale ranging from 1 (strong disagreement) to 5 (strong agreement). Internal reliability of the URICA Total score is acceptable (.79), Cronbach's alphas for the subscales range from adequate to good (0.77, 0.80, 0.84, and 0.82), for the Precontemplation, Contemplation, Action and Maintenance subscales, respectively (Dozois, Westra, Collins, Fung, & Garry, 2004).

Summary and scale/subscale selection.

Although there was a large number of scales and subscales administered to participants the decision was made to rationalise the list for ease of interpretation. The final measures used included: the HCR-20 Total Score (as a measure of aggregate risk); BSI-11 Total, IRI Total and all subscales - IRI Fantasy, IRI Empathy, IRI Personal Distress, IRI Emotional Empathy, IRI Perspective Taking; NAS Total, NAS Cognitive, NAS Arousal, NAS Behavioural, NAS Regulation score, NAS Provocation Inventory Total, SPSI-R Generation Of Alternative Solutions Total, SPSI-R Decision Making Total, SPSI-R Solution implementation Total, SPSI-R Rational Problem Solving Total, SPSI-R Impulsivity-Carelessness, SPSI-R Avoidance Scale, SPSI Index Score; STAXI-2 Anger Expression Total, and STAXI-2 Anger Control Total scale scores, URICA Readiness to Change, and CIRCLE Coercion, Dominance and Hostility scale scores.

Given its impact on treatment responsivity, the mean PCL-SV Total score was compared between groups to determine whether psychopathy might explain observed differences. There was no significant difference on PCL-SV scores $t(59)= .81$, $p=.42$ between the comparison group, mean=12.41(4.43), and treatment group, mean=13.26(3.53). A single participant in the comparison group had an unusually high number of aggressive incidents pre-treatment, constituting a univariate outlier for that group; this person was not included in further analyses.

Aggressive Incidents

The number of acts of aggression (including verbal and physical aggression as well as deliberate property damage) that were recorded in clinical notes were collated through file review after treatment and summed to provide a score reflecting the total number of aggressive behaviours pre-treatment (in the three years prior to treatment) and during the course of treatment (and an equivalent average time-frame for the comparison group participants).

Procedure.

Treatment: Life Minus Violence - Enhanced (LMV-E).

Life Minus Violence - Enhanced (LMV- E, Ireland, 2008) is a cognitive-behavioural treatment programme comprising a minimum of 125 treatment sessions (approximately 300 hours of therapy) of group work as well as individual cognitive rehearsal sessions (between Modules 2 to 6 there are two individual sessions which are designed to enhance understanding of programme content). Homework tasks are also assigned to encourage reflection and skill development. LMV-E was designed to take advantage of more recent academic and theoretical developments in aggression research,

focusing on developments in the field of social cognition, implicit processing, empathy, learning theory and on developmental trajectories of aggression across the lifespan. The programme employs multiple therapeutic methodologies (e.g. group discussion, skills role-play, cognitive rehearsal, creativity techniques) that are tailored to meet the needs of the group and group selection decisions are driven partly by consideration of group cohesion and learning needs.

LMV-E comprises seven treatment modules that together extend over a 10 – 12 month period. Module 1. *Barriers to change, optimism and resilience* encourages participants to address their readiness and motivation for change, reflecting on their personal strengths and also skills that may require attention (approx. 6 sessions). Module 2. *Emotional acceptance, reactivity and regulation* focuses on an awareness of emotions and emotion management, how cognition affects emotions and the development of coping strategies (approx. 26 sessions). Module 3. *How I got here* encourages participants to understand the individual background factors (motivations, thoughts, emotional challenges, environmental and social factors) that may have contributed to the development of their aggression, identifying problematic behavioural patterns that encourage aggression and areas of need for better management of aggression in the future (approx. 14 sessions). Module 4. *Information processing and aggression* helps participants identify patterns in cognition, beliefs, choices and behaviours that may motivate aggression, challenging the justifications for past aggression and difficulties in taking responsibility while identifying alternative thought patterns and non-aggressive responses for the future (approx.. 43 sessions). Module 5. *Consequences for self and others* promotes reflection on the impact that aggression has for the individual,

recognising the impact for others including victims, and developing positive consequences ripples through alterations in behaviour (approx. 27 sessions). Module 6. *Interpersonal skills* focuses on an awareness of how interpersonal skills may foster positive relationships, and learning assertive communication during appropriate situations, with a focus on applying interpersonal skills in practice sessions and outside of sessions (approx. 13 sessions). Module 7. *Working towards the future: Relapse prevention and the 'Good Life Wheel'* helps participants to identify risks for relapse, allows relapse-prevention skills practise and identifies the areas that still need improvement as well as how to achieve the desired 'future me' (approx. 24 sessions). Contact the LMV – E programme developer for further information.

During the period of study, the LMV-E programme was delivered by two qualified Forensic Psychologists, two trainee Forensic Psychologists and three qualified Mental Health Nurses who were trained in delivering the LMV-E programme, and supervised by the treatment manager. The seven therapists delivered all of the therapeutic sessions for the entire programme. Treatment attendance was high. In terms of the proportion of completed sessions, the mean across all participants in the LMV-E group was 93% of available sessions.

Evaluation procedure

The study compared outcomes for a clinical [LMV-E treatment] and comparison group, assessed over three phases, pre- and post-treatment and follow-up. Comparison group participants were asked to complete the post-treatment measures between nine and 12 months after first completion, which is equivalent to the length of LMV-E treatment.

All participants were invited to complete the measures again at follow-up, 12 months after the post-assessment phase.

A quasi-experimental design was adopted since randomization to a clinical or comparison group is ethically contentious. Many releasing authorities demand treatment completion prior to release so randomly allocating a patient to a non-treatment condition may result in prolonged hospitalisation; this is despite uncertainty existing regarding the actual impact of treatment.

The participant's clinical team completed the pre-treatment HCR-20 assessment. A trained RA, who was independent of the project team, re-scored the dynamic items (C and R) post-treatment and at follow-up using information derived from participant's files. These assessments were audited and confirmed independently by clinical staff in the hospital. The PCL-SV was scored pre-treatment by trained research RAs. Unit nursing staff completed the CIRCLE at pre-treatment, post-treatment and follow-up. Participants (treatment and comparison) completed self-report psychological tests pre-treatment, post-treatment and at follow-up.

Approach to analysis.

The original plan was to analyse pre, post to follow-up data. However, given the nature of access to the sample only a single comparison group member participated in follow up assessment. Many comparison group members were uninterested in participating in further psychological testing at follow-up when they had not been involved in the treatment programme. Further, some of the treatment and comparison group participants had been discharged from care and were unable to be followed up. This limited comparisons of outcomes between the treatment and comparison group at

follow-up so the focus of evaluation is comparison of outcomes between pre- and post treatment. A series of 2X(2) mixed model repeated measure ANOVAs evaluated differences between pre and post-test treatment test results for groups (treatment versus comparison) on time (pre- and post- treatment). ANOVA test assumptions were satisfactory for all models for the measures outlined above. With only a single comparison group member remaining at follow-up the post and follow-up comparisons focussed on exploring change in the remaining participants in the treatment group (n = 11), who were assessed across measures, to evaluate whether significant changes in outcomes at post-treatment were maintained. Contrast analyses were undertaken on the treatment group alone evaluating changes in values from pre-treatment to post-treatment through to follow-up.

Results

Change in measures from pre-treatment to post-treatment

Means and standard deviations for each group for pre and post treatment assessments are shown in Table 1. Table 2 shows the ANOVA results for main effects between groups (LMV - E treatment versus comparison) and interaction of group by time (pre-treatment versus post-treatment). Given the large number of comparisons when using independent t-tests, familywise error correction was undertaken using adaptive control of the false discovery rate (FDR) with alpha set at .05, using Benjamini and Hochberg's (2000) graphically sharpened method. The graphically sharpened method false discovery rate (FDR) used by Benjami and Hochberg (2000) evaluated whether multiple significance testing (when a large number of independent tests are undertaken) requires the conservative approach of division through a familywise error adjustment.

They argued that using the classical method of dividing the alpha level by the number of tests undertaken increases the risks in committing a Type II error. Therefore, Benjami and Hochberg (2000) evaluated their approach to testing "32 hypotheses, none of which are true" (p.23) as a power of the use of a typical Bonferroni adjustment of .5 compared to FDR's power of .82 in their adaptive procedure; they noted FDR was more powerful. Therefore, when weighing up the notion of whether to avoid a Type 1 error, they argued this should not be at a cost of committing a Type II error. As such, for this study we used Benjami and Hochberg's (2000) graphically sharpened methods FDR.

Following Benjami and Hochberg (2000), after adjustment due on comparisons, 17 significant effects were identified. Neither significant main effects nor interactions existed for the following measures: BSI-II, IRI Total, IRI Fantasy, IRI Empathy Concern, IRI Personal Distress Scale, IRI Emotional Empathy, IRI Perspective Taking, NAS Cognitive, SPSI-R Impulsivity Carelessness, SPSI-R Avoidance Scale, URICA Readiness to Change scores and CIRCLE's Dominance, Coercion and Hostility. By contrast, there were significant declines across time (pre- to post-treatment) occurring for both groups for the following measures: NAS Anger Regulation, SPSI-R Dominance, SPSI-R Solution Implementation, SPSI-R Rational Problem Solving, the STAXI-2 Anger Expression Score, and Aggression Total (i.e., number of aggressive incidents) from pre- to post-treatment but no significant interactions (see Table 2 for ANOVA results).

There were three measures that reported significant main effects and interactions between groups and pre- to post-test scores with significant declines for the Treatment group. They were the NAS Total, NAS Behavioural and NAS Arousal. Table 2 represents (2x2) mixed model ANOVA output, *F* values, degrees of freedom, significance level, η_p^2,

and identification of both group and direction of the interactions. In addition, a significant main effect on HCR-20 Total Score as well as a significant interaction was found. While there was a significant decline occurring for both groups there was a steeper decline across time for the comparison group compared to the treatment group. A significantly higher value was found for the treatment group compared to the comparison group, $F(1,71) = 10.44$, $p = .003$, $\eta_p^{2} = .13$ representing a large effect, 95% CI for Comparison T1= 23.44-27.11 to T2= 15.81-18.50 and Treatment T1=25.04-29.08 to T2=21.85-24.81.

The significant main effect across time (pre to post) on NAS Total, $F(1,46) = 9.66$, $p = .014$, as well as a significant interaction effect between groups across time (pre and post-treatment) $F(1,46) = 9.17$, $p = .016$, $\eta_p^{2} = .17$ represented a large effect, 95% CI for Comparison T1= 73.85-88.55 to T2= 73.84-88.26 and Treatment T1=73.32-85.75 to T2=62.05-74.23. While this represented a significant decline occurring for both groups, the decline was significantly steeper across time for the Treatment group. Similarly, for NAS Behaviour scale a significant main effect and interaction occurred as well as the NAS Arousal Inventory (see Table 2 for output).

There was a significant main effect across time (pre to post treatment) on SPSI-R Rational Problem Solving, $F(1,46) = 7.76$, $p = .023$, representing a medium effect, 95% CI for Comparison T1= 48.79-62.21 to T2= 49.80-63.70 and Treatment T1=51.08-62.63 to T2=43.39-55.35 with a trend for the treatment group for decline although with adjustment due to multiple comparisons the significance was lost. There was also a significant main effect for the Aggression Total, SPSI-R Dominance, NAS Anger Regulation, SPSI-R Solution Implementation, and STAXI-2 Anger Expression Score (see Table 2 for results).

Generation of Alternative Solutions had a significant interaction $F(1,46) = 6.57$, $p = .03$, $\eta_p^2 = .13$ representing a large effect, 95% CI for Comparison T1= 8.17-12.83 to T2= 8.35-12.15 and Treatment T1=7.67-11.61 to T2=11.43-14.64. This represented a significant increase occurring for the treatment group across time with little change in the comparison group. While there was no significant main effect for group on the NAS Provocation Inventory Total Score, $F(1,45) = 3.58$, $p = .10$, however, there was a significant interaction $F(1,45) = 7.03$, $p = .028$, $\eta_p^2 = .14$ representing a large effect, 95% CI for Comparison T1= 48.79-62.21 to T2= 49.80-63.70 and Treatment T1=51.08-62.63 to T2=43.39-55.35. This represented a significant decline identified only for the treatment group across time. There was also a significant interaction on STAXI-2 Anger Control Total Score $F(1,43) = 10.04$, $p = .003$, $\eta_p^2 = .18$, representing a large effect, 95% CI for Comparison T1= 20.11-25.00 to T2= 19.44-24.16 and Treatment T1=20.00-23.53 to T2=23.93-27.92. This represented a significant steeper increase across time for the treatment group compared to the comparison group.

Repeated Measures ANOVA: Stability of change from pre-treatment to post-treatment to follow-up.

The numbers at follow up for the Comparison group had reduced to a single participant. Therefore, post-hoc analyses were only undertaken on the Treatment group. See Table 3 for means, standard deviations and number of participants for each test on pre-treatment, post-treatment, and follow-up analysis. Five repeated measures ANOVAs identified significant differences emerging across the pre-treatment, post-treatment, to follow-up data. Undertaking one-way repeated measures ANOVA identified a significant effect for the treatment group on HCR-20 Total Scores, $F(2,31)=32.38$, $p < .001$, $\eta_p^2 = .68$

representing a large effect. Sidak post hoc analyses adjusted for familywise error revealed that at follow-up there was a significant decline compared to pre-treatment, (M_{diff} = -3.73, Sidak 95% CI [-6.41 to -1.05] as well as a continued significant decline follow-up compared to post-treatment, (M_{diff} = -5.31, Sidak 95% CI [-7.83 to-2.78]. See Table 3 for means, standard deviations and number per analysis.

A significant decline also occurred in Total NAS for the treatment group, $F(2,9)=8.76$, $p=.008$, $\eta_p^2 = .66$ representing a large effect. Sidak post hoc analyses adjusted for familywise error revealed that at follow-up there was a significant decline compared to pre-treatment, (M_{diff} = -10.09, Sidak 95% CI [-16.68 to -3.51]. A significant decline also occurred on NAS Cognitive Total for the treatment group, $F(2,9)=7.94$, $p=.010$, $\eta_p^2 = .64$, representing a large effect. Sidak post hoc analyses revealed that at follow-up there was a significant decline compared to pre-treatment, (M_{diff} = -3.18, Sidak 95% CI [-5.43 to -.94]. A significant decline also occurred on NAS Behavioural for the treatment group, $F(2,9)=6.32$, $p=.019$, $\eta_p^2 = .58$, representing a large effect. Sidak post hoc analyses revealed that at follow up there was a significant decline compared to pre-treatment, (M_{diff} = -4.00, Sidak 95% CI [-7.23 to -.77]. There was also a significant increase in Decision Making across time, $F(2,9)=5.12$, $p=.033$, $\eta_p^2 = .53$ representing a large effect. Sidak post hoc analyses revealed that at follow up there was a significant increase from pre-treatment to post-treatment, (M_{diff} = -3.64, Sidak 95% CI [-6.73 to -.54].

Given the low power, with only eleven in the sample, the non-significant results on the one-way repeated measures ANOVA is not surprising for the following analyses IRI Fantasy, $F(2,9)=1.24$, p =.34; IRI Empathic Concern $F(2,9)=1.08$, p=.38; IRI

Personal Distress $F(2,9)=1.18$, $p=.35$; IRI Emotional Empathy $F(2,9)=.31$, $p=.74$; IRI Perspective Taking $F(2,9)=1.34$, $p=.31$; NAS Anger Regulation, $F(2,9)=2.59$, $p=.13$; GAS, $F(2,9)=2.54$, $p=.13$; Impulsivity Carelessness, $F(2,9)=1.28$, $p=.33$; Avoidance Scale, $F(2,9)=.52$, $p=.61$; SPSI Index, $F(2,9)=1.21$, $p=.34$; STAXI-2 Anger Express, $F(2,9)=1.39$, $p=.30$; STAXI-2 Anger Control, $F(2,9)=.78$, $p=.49$; URICA Readiness to Change, $F(2,9)=2.08$, $p=.18$; CIRCLE Coercion, $F(2,9)=.21$, $p=.82$; Dominance, $F(2,9)=1.89$, $p=.39$; Hostility, $F(2,9)=.85$, $p=.47$ (Table 3 provides the descriptives for each of the abovementioned analyses). Non significant trends were identified with small effects for NAS Arousal, $F(2,9)=4.00$, $p=.057$, $\eta_p^2 = .16$; SPSI Solution Implementation, $F(2,9)=3.34$, $p=.08$, $\eta_p^2 = .43$; and Rational Problem Solving, $F(2,9)=3.45$, $p=.08$, $\eta_p^2 = .43$.

Discussion

This study assessed whether completion of the LMV-E treatment programme produced change in intermediary treatment targets (dynamic risk factors), violence risk (as measured by aggregated risk scores on the HCR-20), and aggressive behaviour during treatment, and whether these changes were greater than those observed in a comparison group. We also examined whether changes made in LMV-E treatment were maintained one year following treatment completion. Results showed that both LMV-E and non-specific inpatient psychiatric treatment had a positive impact, with reductions in aggressive behaviour, social problem solving (SPSI-R Generation of Alternative Solutions, SPSI-R Solution Implementation and Verification, SPSI-R Decision Making and SPSI-R Rational Problem Solving Total), and anger regulation observed during treatment. Regarding anger, both groups improved in their ability to regulate anger-

engendering thoughts, calm themselves to limit verbal and physical aggression, and to engage in constructive behaviour when provoked (NAS Regulation, NAS Behaviour and STAXI Anger Control Total); and the frequency with which anger manifested and was expressed (STAXI-2 Anger Expression Total and NAS Total). They also showed reductions in the intensity, duration, and degree of somatic tension and irritability (NAS Arousal). LMV-E treatment conferred additional advantage for several elements of anger regulation (NAS Total, NAS Arousal and NAS Behaviour, and STAXI Anger Control Total) and social problem solving (SPSI-R Generation of Alternative Solutions). Only the LMV-E treatment group showed improvement (a reduction) in sensitivity to provocation (NAS Provocation Inventory Total Score). None of these improvements was extended between the post-treatment ratings and the follow-up.

Finally, both LMV-E treatment and comparison participants showed reductions in aggregate violence risk, as measured by HCR-20^{v2} Total Scores and the LMV-E treatment group showed further reductions between he end of treatment and follow-up. Somewhat surprisingly, the comparison group made greater change in HCR-20^{v2} Total Scores (given the small sample of patients in the comparison group it was not possible to determine whether these changes for the comparison group were maintained or extended). Improvements in HCR-20^{v2} Total Scores are important since change in aggregate ratings using structured risk assessment instruments comprising various dynamic risk factors is associated with reduced violent offending (De Vries Robbé, de Vogel, Douglas & Nijman, 2014).

Overall, these results are similar to those studies that have shown treatment positively impacts anger regulation and social problem solving (e.g., Guerra & Slaby,

1990). The similarity in outcomes for treatment and comparison participants, with the exception that LMV-E treatment participants had greater gains on some measures and were the only group to show improvement on sensitivity to provocation, is similar to other studies reporting no changes post-intervention, or equal reductions in violence post-intervention for offenders with SMI allocated to experimental or control groups (Rampling et al., 2016). Rampling et al. (2016) suggest these findings could be due to the positive therapeutic environment in which studies are conducted and the overall high quality of contemporary inpatient care provided to psychiatric patients with histories of violence. However, the treatment group was exposed to the same therapeutic regime and milieu so should therefore have achieved comparable benefits as well as those derived from their participation in the LMV-E violence specific treatment. It seems unreasonable to suggest that participation in violence specific programming detracted from the improvements that might be attributable to the general treatment regime when we consider that the experimental group achieved similar, and on some measures they derived greater, benefit in relation to anger control and social problem solving. Furthermore, somewhat counter intuitively, yet broadly consistent with changes observer in the comparison group from pre-treatment to post-treatment, the LMV-E treatment group continued to improve in HCR-20^{v2} Total Scores from post-treatment to follow-up when they returned to treatment as usual, but they did not show continued improvement in anger control and social problem solving between post-treatment and follow-up.

An important outstanding question is whether the risk factors that did not change are impervious to treatment, or whether the treatment did not effectively address these risk factors, or whether the measures selected for use in this study are insensitive to

change for these constructs. In this study there was no evidence of change in perspective taking or affective empathy, or in interpersonal hostility, dominance and coerciveness or impulsivity. Previous research (Daffern, McCarthy, Huband, Lee, Thomas & Duggan, 2013) has shown that interpersonal hostile-dominance is amenable to change and that these changes are associated with reduced offending following release from custody. However, that study used an alternate measure of interpersonal style, the Impact Message Inventory (IMI); this may indicate the IMI is a more suitable change assessment instrument, although further research, particularly since the CIRCLE has strong predictive validity for violence, is required. There is little evidence that empathy (cognitive or affective) is changeable in violent offenders; Serin et al. (2009) failed to find differences in empathy, as measured by the IRI and another empathy skills measure. Previous research in offender populations also suggests the reliability of IRI subscales is unacceptable, particularly for the Personal Distress subscale, which measures the extent to which an individual feels distress as a result of witnessing another's emotional distress (Beven, O'Brien-Malone, & Hall, 2004; see also Ireland, 1999). According to Bevan et al. (2004) the unacceptable reliability may be due to deficits in verbal intelligence, literacy, and insight, which are necessary for self-report measurements of empathy. The extent to which empathy as measured by the IRI is sensitive to change with treatment is uncertain and requires further attention. Finally, Serin et al. (2009) also failed to find changes in impulsivity in their violent offender treatment outcome study.

Limitations and future directions

The results of this study should be considered in light of several limitations. They limitations are elaborated here to assist future research design more robust studies.

1. The dynamic risk factors included in this study were not exhaustive; there are limits to the number of tests that can be imposed upon patients with SMI participating in a clinical treatment programme. Polaschek (2006) identifies four risk factor domains commonly targeted in violent offender rehabilitation: (i) Attitudinal factors (e.g., procriminal attitudes and cognitive or information-processing biases); (ii) Impulsivity and self-regulation deficits; (iii) Affective dyscontrol (e.g., anger, hostility, and poor coping skills); and (iv) Lifestyle related needs that also predict general criminality (e.g., substance abuse, criminal peers, poor interpersonal skills, family relationships (see also Klepfisz, et al., 2016). This study did not thoroughly assess all relevant attitudinal factors, (e.g., change in early maladaptive schema, the tendency towards rehearsal of aggressive scripts, or general antisocial attitudes). Lifestyle needs were only assessed through several items on the HCR-20^{v2}. Future research should consider inclusion of a range of measures capable of assessing the broad array of dynamic risk factors relevant to violent offending. To determine whether dynamic risk factors are amendable to change it will be important that various psychological tests (structured observer-rated and self-report) are administered. However, given their breadth of coverage, aggregate structured risk assessment measures, perhaps utilising structured observer and self-report assessments of relevant constructs to assist scoring (e.g., the Barrat Impulsivity Scale to assist assessment of HCR20^{V2} C4 Instability), may facilitate broad coverage of relevant risk factors to assess change for individuals with SMI; this method is efficient and is also a valid means of assessing change in relation to

future violence risk (DeVries Robbe, de Vogel, Douglas & Nijman, 2014). Furthermore, measures should be considered that not only assess knowledge but also skills. Skills may be best assessed by performance-based measures (Serin, 1991). Observer rated skills assessment measures or attention to relevant offence paralleling behaviour (Daffern, Jones, Howells, Shine, Mikton & Tunbridge, 2007) will be important for the assessment of each dynamic risk factor within the aggregate risk assessment instruments.

2. Future research should explore change following treatment and link these changes with recidivism data. Although improvements in anger, impulsivity and social problem solving corresponded with reduced aggressive behaviour during treatment, these gains may be insufficient to effect reductions in violent recidivism once released to the community.

3. An important barrier to the interpretation and generalizability of these findings is the small sample studied here. The small sample size likely impacted the power to detect differences between groups. However, it needs to be borne in mind that there are however very few treatment effectiveness studies for violent offenders with mental disorder and more specifically SMI. The sample size in this study is comparable to these other intensive violent offender treatment effectiveness studies (e.g., Bush, 1995 included 11 treated violent offenders; Polaschek et al., 2004, included 22 treated offenders).

4. In this sample of violent offenders with SMI there was no measure of psychiatric symptoms. Many symptoms relate to social perception, anger and hostility (e.g., paranoia will increase hostile attributions) (Podubinski, Lee,

Hollander & Daffern, 2014) and aggression and violence more directly (Douglas, Guy, & Hart, 2009). Future research should ensure assessment of psychiatric symptoms alongside assessment of other risk factors so that change in the dynamic risks can be interpreted in line with change in psychiatric symptoms.

5. Finally, change was primarily assessed by way of pre-post self-report psychological testing, although observer rated risk assessment and evaluation of interpersonal style was also conducted. Notably, raw pre-post differences make no adjustments for measurement error. Some self-report questionnaires may not be valid when used to predict offender recidivism or they have inferior validity as compared to clinician-rated measures (Mills, Loza, & Kroner, 2003). Specific concerns regarding self-report psychological tests are their vulnerability to lying, manipulation, and self-presentation biases. Furthermore, although evaluating group-level changes is useful in determining the efficacy of treatment as a whole, evaluating treatment completers as a single cohort may attenuate or mask significant effects among those who do, or do not, receive benefit from treatment. To determine whether treatment is statistically significant for any particular treatment completer, clinicians must adopt an individual-centric methodology such as the reliable change index (RCI) (Barnett, Wakeling, Mandeville-Norden, & Rakestrow, 2013; Christensen & Mendoza, 1986) or measures of Clinically Significant Change (CSC) (Jacobson, Follette, & Revenstorf, 1986). Few violent offender treatment effectiveness studies have investigated this area and as yet (1) there is a lack of

reliable and consistent findings linking within-treatment change with decreased recidivism and (2) no methodology has been proposed for integrating the results (as they pertain to clinically significant and reliable change) when multiple psychological tests like the battery used here, which produced divergent results, are used. When various psychological tests are used to determine change in different psychologically relevant domains it will be critical to determine how to aggregate individual level change. Since post treatment aggression data is presently unavailable and since there is no methodology for aggregating RCI and CSC findings from various tests we have not conducted these analyses.

Conclusion

Results of this study provide preliminary support for the effectiveness of LMV-E, with evidence of reductions in aggressive behaviour during treatment, violence risk, and anger regulation, and improvement in social problem solving. Importantly, these changes did not differ significantly to comparison participants, except that LMV-E treatment completion conferred additional benefits with regard to anger regulation, sensitivity to provocation and social problem solving. These results are important since they contribute to a small but important body of literature exploring the possibility of violent offender treatment effectiveness in patients with SMI.

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Table 1.
Means and SD scores for Treatment versus Comparison for Pre and Post treatment

	Treatment				Comparison			
	Pre	n	Post	n	Pre	n	Post	n
Measures								
Aggression	8.73(11.47)	22	1.77(3.13)	22	2.84(4.80)	19	.89(2.11)	19
BSI-2 Total	63.41(7.78)	27	58.11(9.83)	27	64.55(10.31)	20	61.25(10.80)	20
HCR-20 Total	27.06(5.85)	33	25.28(5.80)	33	25.28(4.71)	40	17.15(3.86)	40
IRI Total	85.57(12.04)	28	84.61(15.97)	28	85.80(13.23)	20	86.09(13.35)	20
IRI Fantasy Total	19.04(4.73)	28	17.82(6.46)	28	18.45(4.74)	20	18.75(6.32)	20
IRI Empathy Concern	24.57(4.99)	28	23.46(5.04)	28	24.08(5.22)	20	25.00(4.59)	20
IRI Personal Distress	18.89(4.35)	28	19.14(5.37)	28	18.55(4.17)	20	17.70(3.88)	20
IRI Emotional Empathy	43.46(6.67)	28	42.61(7.85)	28	43.35(6.39)	20	42.70(6.61)	20
IRI Perspective Taking	23.07(4.66)	28	24.18(5.76)	28	24.00(5.51)	20	24.55(4.37)	20
Total NAS	79.54(13.57)	28	68.14(12.95)	28	81.20(19.59)	20	81.05(19.55)	20
NAS Total Cognitive	27.54(4.73)	28	24.50(5.17)	28	29.15(7.25)	20	28.95(5.53)	20
NAS Arousal Total	25.61(4.56)	28	22.07(4.29)	28	26.00(6.24)	20	26.25(7.14)	20
NAS Behavioral Total	26.39(5.78)	28	21.57(4.39)	28	26.05(7.21)	20	25.85(7.71)	20
NAS Regulation Total	25.36(3.82)	28	28.00(3.50)	28	24.70(3.88)	20	26.65(3.79)	20
NAS Provocation Inventory	56.85(14.33)	27	49.37(15.02)	27	56.50(15.64)	20	56.75(15.96)	20
SPSI-R GAS	9.64(5.57)	28	13.04(4.21)	28	10.50(4.57)	20	10.25(4.23)	20
SPSI-R Decision Making	7.89(5.54)	28	10.43(4.30)	28	8.65(4.34)	20	9.25(4.51)	20
SPSI-R SI	8.25(5.75)	28	11.11(4.29)	28	8.65(4.16)	20	9.35(3.95)	20
SPSI-R RPS	39.29(24.87)	28	52.64(18.19)	28	43.50(17.78)	20	45.45(17.85)	20
SPSI-R IC-S	11.43(8.02)	28	8.93(5.15)	28	12.30(8.02)	20	11.60(7.07)	20
SPSI-R Avoidance Scale	9.07(6.59)	28	7.14(3.79)	28	8.30(6.20)	20	9.05(5.61)	20
SPSI-R Total Score	76.57(32.80)	28	83.54(19.54)	28	82.55(34.59)	20	84.15(30.42)	20
STAXI Anger Exp Tot	28.00(6.79)	28	24.39(6.50)	28	31.05(6.56)	20	27.50(5.50)	20
STAXI Anger Cont In Tot	21.46(5.67)	28	25.93(5.73)	28	22.55(5.07)	20	21.80(4.47)	20
URICA Readiness to Change	102.21(13.27)	28	99.14(13.98)	28	106.50(10.84)	20	105.25(11.27)	20
CIRCLE Coercion Total	9.38(7.86)	26	8.31(6.60)	26	10.33(9.57)	15	8.53(8.11)	15
CIRCLE Dominance Total	8.46(4.87)	26	8.73(4.82)	26	9.67(7.44)	15	7.73(5.40)	15
CIRCLE Hostility Total	16.12(6.81)	26	16.96(5.20)	26	17.80(8.86)	15	15.53(5.69)	15

Table 2.
2X(2) *ANOVA results for main effects between groups and interaction of group X time (pre-post)*

	F value	(df)	*p* value	η_p^2	Gp Change
Measures					
Aggression Total m/e	6.09	(1, 42)	.038*	.13	
Interaction	.16	(1, 42)	.49	.00	
BSI-11 m/e	5.11	(1, 45)	.055	.10	
Interaction	.28	(1, 45)	.45	.01	
HCR-20 Total m/e	75.74	(1, 71)	<.001 ***	.52	
Interaction	13.95	(1, 71)	.003 **	.16	Comparison
IRI Total m/e	.04	(1, 46)	.54 NS	<.01	
Interaction	.10	(1, 46)	.50 NS	<.01	
IRI Fantasy Total m/e	.32	(1, 46)	.43 NS	<.01	
Interaction	.89	(1, 46)	.33 NS	.02	
IRI Empathy Concern m/e	.37	(1, 46)	.43 NS	<.01	
Interaction	.77	(1, 46)	.35 NS	.02	
IRI Personal Distress m/e	.13	(1, 46)	.50 NS	<.01	
Interaction	.43	(1, 46)	.43 NS	.01	
IRI Emotional Empathy m/e	.68	(1, 46)	.37 NS	.02	
Interaction	.02	(1, 46)	.56 NS	<.01	
IRI Perspective Taking m/e	.97	(1, 46)	.32 NS	.02	
Interaction	.11	(1, 46)	.50 NS	<.01	
NAS Total m/e	9.66	(1, 46)	.014*	.17	
Interaction	9.17	(1, 46)	.016*	.17	Treatment
NAS Cognitive m/e	4.93	(1, 46)	.055	.10	
Interaction	3.79	(1, 46)	.09	.08	
NAS Arousal m/e	7.91	(1, 46)	.023*	.15	
Interaction	10.5	(1, 46)	.012*	.19	Treatment
NAS Behavior m/e	10.5	(1, 46)	.012*	.19	
Interaction	8.89	(1, 46)	.018*	.16	Treatment
NAS Regulatory m/e	17.82	(1, 46)	.002**	.28	
Interaction	.41	(1, 46)	.43 NS	<.01	
NAS Provocation m/e	3.58	(1, 45)	.098 NS	.07	
Interaction	7.03	(1, 45)	.028*	.14	Treatment
SPSI-R GAS m/e	4.89	(1, 46)	.055	.10	
Interaction	6.57	(1, 46)	.033*	.13	Treatment
SPSI-R DM m/e	6.03	(1, 46)	.038*	.12	
Interaction	2.30	(1, 46)	.14 NS	.05	
SPSI-R SI m/e	7.48	(1, 46)	.024*	.14	
Interaction	2.75	(1, 46)	.18	.06	
SPSI-R RPS m/e	7.76	(1, 46)	.023 *	.15	
Interaction	4.31	(1, 46)	.07	.09	
SPSI-R IC-S m/e	3.30	(1, 46)	.10 NS	.07	
Interaction	1.04	(1, 46)	.31 NS	.02	
SPSI-R Avoidance m/e	.59	(1, 46)	.39 NS	<.01	
Interaction	3.07	(1, 46)	.09 NS	.06	

Table 2 continued.
2X(2) *ANOVA results for main effects between groups and interaction of group X time (pre-post)*

	F value	(df)	*p* value	η_p^2	Gp Change
Measures					
SPSI Total Score main effect	.1.21	(1, 46)	.43 NS	.03	
Interaction	.47	(1, 46)	.42 NS	<.01	
STAXI-2 Anger Exp Tot m/e	15.82	(1, 46)	.003**	.26	
Interaction	.24	(1, 46)	.45 NS	<.01	
STAXI-2 Anger Cont Tot m/e	5.10	(1, 46)	.055	.10	
Interaction	10.04	(1, 46)	.014*	.18	Treatment
URICA Readiness m/e	2.00	(1, 46)	.43 NS	.04	
Interaction	.36	(1, 46)	.43 NS	<.01	
CIRCLE Coercion Total m/e	1.21	(1, 39)	.51 NS	.03	
Interaction	.08	(1, 39)	.45 NS	<.01	
CIRCLE Domin Total m/e	1.11	(1, 39)	.45 NS	.03	
Interaction	1.94	(1, 39)	.45 NS	.05	
CIRCLE Hostility Total m/e	.25	(1, 39)	.45 NS	<.01	
Interaction	1.20	(1, 39)	.30 NS	.03	

NB: Where significant declines occurred the group where the decline occurred is noted in the Gp Change column. m/e = Main Effect. Main effects and Interaction significance levels adjusted to accommodate familywise error and alpha was set at .05, using FDR Graphically Sharpened Method (Benjamini & Hochberg, 2000).

Table 3.
Means and standard deviations at pre, post and follow-up for Treatment group

	Pre	Post	Follow-up	(*n*)
Measures	Mean (SD)	Mean (SD)	Mean (SD)	
HCR-20	27.06(5.85)	23.33(4.71)	18.03(4.44)	33 ***
BISIIr Total	63.55(7.98)	57.36(8.72)	57.18(9.27)	11
Total NAS	81.91(13.97)	71.27(15.25)	71.82(15.61)	11 **
NAS Cognitive	28.91(5.50)	25.73(6.00)	25.73(5.55)	11 **
NAS Behavioral	26.91(5.70)	22.91(5.14)	22.91(6.36)	11 *
IRI Fantasy	19.55(5.05)	21.00(6.00)	31.36(4.84)	11
IRI Empathic Concern	25.00(5.69)	24.73(4.65)	26.55(3.53)	11
IRI Personal Distress	19.27(4.24)	20.91(5.86)	18.00(3.41)	11
IRI Emotional Empathy	44.27(7.79)	45.64(7.35)	44.55(5.56)	11
IRI Perspective Taking	22.64(4.54)	25.55(4.84)	26.09(5.20)	11
NAS Arousal	26.09(4.44)	22.63(4.80)	23.18(4.79)	11^
NAS Anger Regulation	25.55(2.94)	27.64(3.80)	26.73(2.90)	11
SPSI-R GAS	8.18(5.58)	12.36(4.76)	11.63(3.91)	11
SPSI-R Decision Making	7.00(5.04)	10.64(4.84)	10.36(4.70)	11*
SPSI-R IC-S	11.73(6.77)	8.73(5.92)	9.63(7.72)	11^
SPSI-R RPS	32.36(24.88)	51.45(20.98)	50.55(21.94)	11^
SPSI-R Impul/Carelessness	11.33(5.36)	8.33(5.94)	10.78(8.06)	11
SPSI-R Avoidance Scale	8.82(4.77)	8.00(3.58)	6.82(5.36)	11
SPSI Index	69.55(26.99)	82.73(19.57)	80.27(28.30)	11
STAXI-2 Anger Express	17.09(5.03)	16.36(2.38)	15.18(.40)	11
STAXI-2 Anger Control	21.36(3.78)	23.55(6.96)	23.18(6.11)	11
URICA Readiness to Change	104.00(8.38)	100.73(9.95)	103.09(6.77)	11
CIRCLE Coercion	8.38(7.71)	8.75(8.00)	8.13(8.53)	8
Dominance	9.00(5.10)	8.75(4.13)	11.13(5.14)	8
Hostility	15.38(7.63)	16.38(4.44)	15.63(6.07)	8

^ indicates a trend with significant effect but not p value; * $p < .05$, ** $p < .01$ & *** $p < .001$.