

Short-term effects of restorative justice conferences on post-traumatic stress symptoms among robbery and burglary victims: a randomized controlled trial

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Abstract

Objectives To examine the impact of face-to-face restorative justice conference (RJC) meetings led by police officers between crime victims and their offenders on victims' post-traumatic stress symptoms.

Methods Two trials conducted in London randomly assigned burglary or robbery cases with consenting victims and offenders to either a face-to-face restorative justice conference (RJC) in addition to conventional justice treatment or conventional treatment without a RJC. Post-traumatic stress symptoms (PTSS) were measured with the Impact of Event Scale-Revised (IES-R) within 1 month of treatment for 192 victims.

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We assessed the prevalence and severity of PTSS scores following treatment, using independent sample *t* tests and chi square statistics. We further measured the magnitude of the differences between the groups, using effect size analyses.

Results Analyses show that PTSS scores are significantly lower among victims assigned to RJC in addition to criminal justice processing through the courts than to customary criminal justice processing alone. There are overall 49 % fewer victims with clinical levels of PTSS, and possible PTSD ($IES-R \geq 25$). Main treatment effects are significant ($t=2.069$; $p < .05$).

Conclusions Findings suggest that restorative justice conferences reduce clinical levels of PTSS and possibly PTSD in a short-term follow-up assessment. Future research should include longer follow-up, larger and more stratified samples, and financial data to account for the cost benefit implications of RJ conferences compared to ordinary PTSS treatments.

Keywords Restorative justice · Crime victims · Post-traumatic stress · PTS · Experiments · Randomized controlled trials · Robbery · Burglary

Introduction

Face-to-face restorative justice conferences (RJC) have been tested in 12 separate randomized controlled trials on three continents at nearly every stage of the criminal justice process (Sherman and Strang 2012; Strang et al. 2006). A RJC, which is only one variant of the wide range of restorative practices (Braithwaite 2002), consists of a meeting at which specially-trained facilitators assemble crime victims, their offenders, and their respective friends and family to discuss the crime and the harm it has caused (Sherman and Strang 2007; Shapland et al. 2008). The available experimental and quasi-experimental research has demonstrated positive benefits for victims who participate in these meetings (Strang 2002; Sherman et al. 2005; Shapland et al. 2007). Victims whose cases were randomized to RJCs often express less desire for revenge against offenders, less anger at the justice system, and greater satisfaction with how their case was handled compared to victims who were not randomly assigned to RJCs (Strang 2002; Sherman et al. 2005). RJC benefits have also been observed across a wide range of psychological outcomes (Braithwaite 1999, 2002; Latimer et al. 2001; Umbreit et al. 2000). This is particularly important since the psychological harms of crimes experienced by victims can have clinical (that is, medically relevant) manifestations that can impair overall physical health and quality of life (Kilpatrick et al. 1989).

One type of clinical manifestation seen by mental health practitioners in crime victims is post-traumatic stress, which is characterized by symptoms of re-experiencing a distressing event, avoiding reminders of the event, and hyper-arousal (feeling “watchful” and “on-guard”) (American Psychiatric Association 1994). Even low to moderate levels of post-traumatic stress symptoms (PTSS) are associated with increased rates of morbidity and mortality from coronary heart disease, as well as greater medical utilization, more intense physical symptoms, and poorer health functioning than those without PTSS (Kubzansky et al. 2007; Gillock et al. 2005). PTSS is also linked to social and work morbidity (Zlotnick et al. 2002), and the economic burden of PTSS is considerable: post-traumatic stress accounts for an average of 24

working days lost per year per worker affected by it, with 42 % of those suffering from post-traumatic stress receiving Incapacity Benefits or Income Support (Layard et al. 2007).

One of the challenges for mental health professionals in treating PTSS is the difficulty that crime victims have in accessing psychological care (Stein et al. 2007). Non-pharmacological treatment guidelines for the pathological exacerbation of PTSS (resulting in the full-blown post-traumatic stress disorder diagnosis, PTSD) specify the offering of cognitive behavioral therapy (CBT) for PTSD (National Collaborating Centre for Mental Health 2005; Bisson and Andrew 2009). Cognitive behavioral therapy is a generalized label to describe psychotherapeutic techniques that teach patients to modify their negative emotions, behaviors, and thoughts to elicit behavioral change. The treatment for PTSD after criminal events refutes the victims' fear-promoting, counterfactual thinking about the offense ("cognitive restructuring") and then desensitizes individuals to persons, places, or things that remind them of the event ("exposure therapy"). Treatment is scripted and generally provided by trained mental health professionals in clinical settings. CBT has been shown to reduce the prevalence of PTSD by up to 35 % in a randomized trial comparing CBT to a clinically relevant comparison group (Schnurr et al. 2007). Access to any form of CBT, however, is severely limited. Although this issue is a national priority for the UK's health service (Department of Health 2011, 2013), the average wait to begin treatment in the UK is 9 months, due to the lack of qualified professionals (Layard et al. 2006, 2007; Shafran et al. 2009). The need for repeated sessions over a 9- to 12-week period also makes CBT expensive. Given these difficulties, alternative interventions are constantly needed to help victims with PTSS in general and crime victims with PTSS more specifically.

The evidence gathered from RJC research suggests that it may provide such an alternative. Given victims' high satisfaction from RJC compared to traditional criminal justice processes, RJC can potentially also provide psychological improvements, including reductions in PTSS. RJC empowers victims and allows them to confront their offenders and obtain new and helpful information about the offense, which can in turn provide emotional closure and reduce the psychological stress associated with the crime. Therefore, RJC could be linked to a reduction in post-traumatic stress symptoms. Nevertheless, we lack any direct evidence to such an extent.

This paper reports the first assessment of the hypothesis that a RJ conference can reduce PTSS in victims. Our test is drawn from the UK model of using RJ conferences in addition to conventional justice (CJ+RJC), for adult robbery and burglary victims, just prior to sentencing, across all 12 Crown Courts in Greater London. The Impact of Event Scale-Revised (IES-R), a psychometrically-validated measure of PTSS, was used to assess the impact of RJC on PTSS of victims of rather serious crimes, compared to similar victims who went through conventional justice (CJ) without RJC. Data were gathered approximately 1 month and from the day of random assignment, which turned out to be roughly 6 months following the crime event. We used a number of statistical analyses to assess the effect of this treatment, including effect size analyses used to measure the magnitude of RJC effect versus treatment as usual.

Post-traumatic stress symptoms in victims of crime, cognitive behavioral therapy and restorative justice conferences

Post-traumatic stress symptoms are a widespread response to criminal victimization. For the majority of individuals, there is a natural recovery period that is mostly resolved within a few months post-offense (Horowitz 1976). Nevertheless, pathological manifestation of PTSS as a psychiatric condition, PTSD, appears in an estimated 30 % of crime victims (Kilpatrick et al. 1987). However, even those who never qualify for the PTSD diagnosis can experience quality of life disruption as a result of the symptoms experienced (Kubzansky et al. 2007; Gillock et al. 2005).

Diagnosis of PTSD is indicated if the criminal event constitutes a “psychological trauma,” (formally defined by the Fourth Edition of the *Diagnostic and Statistical Manual of Mental Disorders* as a life-threatening event resulting in fear, helplessness, or horror) and the individual fulfils a preset criterion delineating the frequency, intensity, and duration of their PTSS (American Psychiatric Association 1994). A broad range of events that do not fulfill the trauma criteria, like burglaries or robberies with little or no violence, can still produce PTSS (Zlotnick et al. 2002). For symptomatic individuals, it is often the case that the distressing event is persistently re-experienced in through either recurrent and intrusive distressing recollections of the event (e.g., images, thoughts, or perceptions) and/or recurrent distressing dreams of the event. Distressed individuals can experience acting or feeling as if the event were recurring, along with intense psychological suffering at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event. Physiologic reactivity to such exposure is also not uncommon.

In order to deal with intrusion and arousal symptoms associated with PTSD, untreated victims often avoid stimuli associated with the trauma. For example, victims tend to avoid thoughts, feelings, or conversations associated with the trauma, or may avoid activities, places, or people that arouse recollections of the trauma. Such avoidance can lead to markedly diminished interest or participation in significant activities, or feeling of detachment or estrangement from others, which can all equally weaken the quality of life. For example, significant distress or impairment in social, occupational, or other important areas of functioning were recorded over a number of studies on crime victims (Hanson et al. 2010).

Post-traumatic Stress Symptoms and Cognitive Behavioral Therapy

Generally speaking, for crime victims who experience clinical levels of PTSS or PTSD, there are a number of available forms of treatment that can potentially help them deal with the trauma and manage the stress. Of these treatments, cognitive behavioral therapy (CBT) is commonly believed to be among the most effective and has shown considerable success rates (National Collaborating Centre for Mental Health, 2005; Bisson and Andrew 2009).

In broad terms, CBT refers to a group of psychotherapeutic techniques that “teach” patients to modify their negative emotions, behaviors, and thoughts to elicit behavioral change (Foa and Meadows 1997; Sherman et al. 2005). In the case of CBT for crime victims, therapy is often framed in “emotional processing theory” (Foa and Kozack 1986). This framework postulates that fearful events (such as a crime) become

“encoded” in a way that interactions with persons, places, or things associated with the event can activate a fear response. The fear response cascades into some of the physical symptoms described above, and in order to “emotionally process” the event in a healthy way—that is, to return to undisrupted behavior after an emotional disturbance has waned (Rachman 1980)—the victim must therefore “re-write” the programmed response to the fear stimulus.

In clinical treatment settings, emotional processing theory suggests that such ‘code re-writing’ can be achieved through two complementary therapeutic techniques (Bryant et al. 2008). The first is cognitive restructuring and the second is exposure therapy. Cognitive restructuring is a coping strategy designed to deal specifically with anxiety. It involves teaching individuals to identify and evaluate dysfunctional thoughts about their victimization, elicit rational alternative thoughts, and evaluate their beliefs about themselves, the offense, and the world (Harvey et al. 2003; Marks et al. 1998). It has been shown that, for those who develop PTSD, a key impediment to recovery is the internal dialogue individuals have with themselves about the deservedness of their victimization. People tend to blame and punish themselves for the offense, believing that the crime was their fault and/or their own stupidity lead to the offense (Foa and Rothbaum 1998). For instance, constant rumination about “why did this happen to me?” was found to be particularly counterproductive in assisting individuals to emotionally process the offense, since the very question begs them to offer their own erroneous self-appraisals of themselves as incompetent people (Borkovec and Inz 1990). Cognitive restructuring therefore works to facilitate a process of rewriting the internal scripts that people tend to repeat in their minds that hinder their abilities to “get over it”.

Second, exposure therapy implements a combination of techniques that subject the victim to thoughts, images, and other reminders of the event within the context of a controlled environment. This process helps victims desensitize themselves to the frightening elements of the event and emotionally process the trauma. In practice, exposure techniques take place in clinical environments that often include only the therapist and the victim, while the former implements a manualized script which prompt the victim to verbally talk through his or her crime experience. This process forces the victim to engage the fearful memories that are otherwise avoided. As a result of doing this in a safe and supportive environment, the victim is more likely to accomplish the emotional processing required to deal with the symptoms associated with PTSD (Foa and Kozack 1986).

Potential links between cognitive behavioral therapy and restorative justice conferences in the context of post-traumatic stress symptoms

Restorative justice conferencing is a theoretically-grounded alternative to formal criminal justice processing (Braithwaite 1989, 2002). Briefly, face-to-face RJC consists of meetings in which trained facilitators bring together victims and offenders and their supporters to reach a resolution between them. At these meetings, the parties discuss the incident and the harm it has caused, after which offenders can make apology and offer to make amends (Sherman and Strang 2007; Shapland et al. 2007). The dynamics of the conference—whereby victims can speak their mind (as opposed to criminal justice proceedings in which the victim is not generally given the opportunity) and

where victims can directly confront the offender and ask questions—appear to be particularly empowering. Conferences have also been shown to have benefits across a wide range of psychological outcomes (Braithwaite 1999, 2002; Latimer et al. 2001; Umbreit et al. 2000), with two evaluations providing quasi-experimental and experimental evidence of positive victim effects (Strang 2002; Shapland et al. 2007).

Strang (2002) conducted the most comprehensive assessment to date of the impact of RJ conferencing on victim participants. She examined the difference in the restoration of emotional harm of 232 property and violent crime victims whose cases were randomly assigned to court or a RJ conference. The offenders involved in the property offenses were juveniles and the offenders involved in the violent offenses were up to 29 years. Results suggested that conferences played a positive role in improving the emotional and psychological states of victims. Conference participants' anger, fear, and anxiety towards their offender declined after their conference while their feelings of security for themselves and sympathy for their offender increased. Conferences improved victims' feelings of dignity, self-respect, and self-confidence and led to reduced levels of embarrassment and shame about the offense. Overall, victims most often said their conference had been a helpful experience in allowing them to feel more settled about the offense, to feel forgiving towards their offender, and to experience a sense of closure.

Strang's findings (2002) have been replicated in the United Kingdom and have included more serious offenses. Shapland et al. (2007) evaluated the Justice Research Consortium's randomized trial of burglary and robbery victims who had been randomly assigned with their offender to conventional justice as usual or to a restorative justice conference in addition to court. Shapland et al. interviewed 216 conference participants and 166 control participants, eight to nine months following conferences, and their evaluation concluded that victims who participated in RJ conferences had positive memories of the conference, found the conference process satisfying, felt less likely to want to retaliate against their offender, and that the conference provided a sense of closure.

Psychological harms of crimes experienced by victims can have severe manifestations (Kilpatrick et al. 1989), like PTSS, Available interview data suggest quite strongly that RJC can potentially reduce these problems; however, no rigorous tests of this hypothesis have been conducted. The current investigation is different from the previous investigations as it is the first direct test of the hypothesis that an RJ conference can reduce PTSS in robbery and burglary victims.

The precise psychological and physiological mechanisms in which these benefits are thought to take place are less clear. One possible explanation however is the similarity between CBT approach and RJC. For example, RJC entails a direct confrontation between the victim and the source of his or her stress—which is central to exposure therapy. Equally important, the face-to-face meeting provides an evocative fearful medium for victims through their direct confrontations with their offenders. Victims are therefore given an opportunity to assess the offender and ask questions, which allows for new information to be learned about the offense and, by implication, provides a framework for cognitive restructuring.

In addition to that, victims' direct, face-to-face confrontations with their offenders are often highly emotional meetings for all parties. We believe that such settings provide a mechanism for emotional processing of the crime. The empowerment of

the victim despite the intensive exposure to the source of stress and fear, coupled with the ability to attain emotional closure (Strang 2002), are qualities that are shared by both CBT and RJC. Likewise, while conferences can take place in a variety of settings, including prison, they are also quasi-scripted since all police facilitators will have undergone rigorous training and follow an outline of steps to proceed through the conference.

To date, however, the literature on the potential links between CBT and RJC has been rich in theory but rather thin on rigorous research—more generally and specifically in the context of PTSD. The primary body of evidence about the theoretical connections between RJ conferences and CBT (e.g., the efficacy of exposure therapy and cognitive restructuring) is nearly always limited to a treatment-seeking group of patients diagnosed with PTSD. In other words, the knowledge base is condensed to observations of a selective group of individuals that actively seek therapy and are already known to be suffering from PTSS—both of which form the eligibility criteria for entering PTSD clinical trials.

On the other hand, the threshold of mental health severity is not a consideration in enrolment into RJC experiments and a more robust approach was utilized, in order to include any eligible victim of crime. It is often assumed that individuals entering RJ trials experience a wide range of PTSS, but neither the levels of PTSS at entry level nor the potential effects of RJC on reducing PTSS were ever measured. We suggest, however, that should RJC prove to alleviate PTSS, it would offer greater potential for public health by reaching a larger number of people, compared to a clinically-based treatment program.

Hypotheses

Given the theoretical links between RJC and CBT framework, we hypothesize that victims who experience face-to-face RJC in addition to formal justice processes through the court will exhibit significantly reduced symptoms of post-traumatic stress, compared to participants who go through the criminal justice system without such conferences. PTSS levels will be measured in both arms with a well-validated test called the Impact of Event Scale-Revised (IES-R) (Weiss and Marmar 1997), which we will describe more fully below. We test this hypothesis on adult robbery and burglary victims; however the postulation can likely be generalized to all victims of crime who suffer from PTSS.

Methods

Study settings and participants

The present study is part of a series of UK randomized controlled trials on the effects of face-to-face restorative justice conferences on offenders and their victims. The methods used in these experiments were described in depth in an earlier published report (see Sherman et al. 2005). The primary goals of the original study were to examine the impact of restorative justice on offender recidivism and victim satisfaction with the restorative justice process

The data analyzed for the purpose of the present study were gathered from two experimental sites in London, in cooperation with London Metropolitan Police (Sherman et al. 2005). The offenses included burglary, aggravated burglary, and robbery and were serious enough to have been dealt with by Crown Court. Between December 2002 and May 2004, our research team recruited 100 robbery cases and 135 burglary and aggravated burglary cases ($n=235$). These cases came from Crown Courts following admission of guilt by the offender, and most of the offenders recruited for the trials were remanded to prison awaiting sentencing. Some cases contained more than one victim, and in total 274 individuals (from the 235 cases) were included in the original experiments at these sites. These individuals were randomly assigned into either customary criminal justice processes through the court (CJ; $n=146$) or customary criminal justice processes coupled with restorative justice conferences (RJC; $n=128$). We were unable to use all the original 274 individuals for the present analysis as 63 cases were already randomly assigned to treatment before we began collecting PTSS data. Therefore, our total sample consists of 192 eligible individuals, with 89 experimental (CJ+RJC) and 103 control (CJ only) participants. We looked to capture PTSS data 30 days following random assignment, and therefore these participants have fallen outside our interview protocol timeline.

Victim participants were deemed eligible for this study if (1) they were over 17 years of age; (2) had offenders who pled guilty at their trials; (3) had offenders who consented to participate in a randomized trial of RJC; (4) gave consent to participate in the randomized trial as well as to be interviewed following the RJC; and (5) could speak and understand English to a satisfactory degree.

Procedure and measurement

Prior to study entry, each case followed standard criminal justice proceedings in which offenders enter a guilty plea. The criminal event was followed by the offender's arrest by the police and followed by ordinary criminal prosecution in Crown Court, the higher court of first instance in criminal cases in England and Wales. Each case included a judicial request for a pre-sentence report from probation authorities, at which point the case was identified by the research team who assessed the case for eligibility. To emphasize, both experimental and control victims experienced conventional justice as usual, while experimental participants also went through an RJC while none of the control participants were assigned such treatment. Only one control participant 'crossed-over' to the experimental group; however, we will analyze this case 'as assigned' within an intention-to-treat framework.

All eligible victims who consented to participate in the research were telephoned by a psychiatric nurse following sentencing. Each interview took about 15–20 min per person. Participant protections, which included password protection of data and participant confidentiality, were maintained throughout the study protocol.

We assessed PTSS levels with the IES-R (Weiss and Marmar 1997), a revised version of the original Impact of Event Scale (IES) (Horowitz et al. 1979). The IES-R is a well-validated 22-item self-report instrument, designed to measure intrusion, avoidance, and hyper-arousal symptoms in people who experienced a stressful life event. Respondents answered questions in relation to how symptoms related to their offense had been manifested in the previous 7 days. Participants endorsed items on a

scale ranging from 0, “not at all,” to 4, “extremely”. The total IES-R scores can range from 0 to 88. The clinical interpretation of symptom levels have demonstrated that a score of 22–25 provides minimum standards for diagnostic effectiveness for PTSD (Asukai et al. 2002; Rash et al. 2008), although we were not seeking to screen for PTSD in our sample. Lower thresholds for severe clinical severity have been reported by Horowitz (1982) for the original IES (≥ 19) and IES-R (≥ 20) (Feinstein et al. 2002; Hawryluck et al. 2004). Consistent with the published, peer-reviewed literature reporting psychometric properties, we interpret the cutoff score of 25 or higher consistent with more severe clinical severity of PTSS, and possible PTSD. We measured IES-R scores approximately 30 days following random assignment, which corresponded to approximately 6 months following the criminal incident.

Treatments

Eligible RJC cases were assigned to specially-trained police constables working fulltime on RJ conferences. Victims whose cases were randomly assigned to the experimental condition were asked to name a time and day for the conference, and almost all RJC were held in a London prison where the offenders had been remanded to await sentencing. Social supporters (including family and friends) of both victims and offenders were also invited to attend. These conferences usually consisted of a 2- to 3-h meeting at which these police-trained facilitators assembled the parties to discuss the crime and the harm it has caused. The meetings were often emotionally intense and provoked strong feelings, after which offenders usually apologized and offered to make amends. For a more elaborate description of the RJ treatment, see Sherman and Strang (2007).

Eligible cases randomly assigned to the control condition were treated with a “business as usual” approach. Victims in these cases did not take part in any face-to-face restorative justice conferences, and they were not asked to meet their offenders, directly or indirectly.

Statistical power

We estimated that based on our sample size we would be able to detect a small-to-medium effect sizes (standardized mean difference=0.4), with 80 % statistical power with a conservative two-tailed hypothesis based on a 0.05 alpha level (Cohen 1988). Power calculations were carried out using G*Power 3.1 (Faul et al. 2009).

Statistical analyses

In order to measure the effect of RJC on PTSS experienced by victims of crime, we performed three sets of analyses with the available data. First, we looked at the dependent variable as a binary outcome in order to measure the prevalence of clinical levels of PTSS (and possible PTSD) among experimental and control participants (scores of 25 or more on the IES-R). We used independent samples *t* tests for proportions in order to capture these outcomes.

Second, we analyzed whether there are statistically significant differences in terms of PTSS levels between experimental and control groups approximately 30 days

following random assignment, using independent sample *t* tests. We took this approach to observe differences in PTSS scores. For our third analysis, we also measured the magnitude of these differences using standardized mean differences tests in the form of Cohen's (1988) *d*. For the overall short-term effect of RJC (within 30 days), we were able to utilize data on all 192 eligible cases (89 experimental and 103 control cases). The missing data proportions were distributed randomly across the two groups ($t(190)=-1.312; p>.1$), which suggests that there is no particular pattern in the missing entries and that no adjustment methods were required.

Results

Sample characteristics

Baseline characteristics of the participants in are listed in Table 1. As shown, no significant differences existed between treatment groups in terms of any of these variables, except the number of months between the date of the offense and the first interview [control group mean=5.25 (SD=2.57) range: 0.67 to 13.57 months vs. experimental group mean=5.98 (SD=3.19), range: 1.30 to 21.07] and only at the .1 level [$t(190)=-1.761; p=.08$]. Victims' mean age at the time of random assignment was 38 (SD=13.4), while 54.7 % were female victims and primarily white (85 %). We have had more burglary cases than robbery cases (about 2:1 ratio) and as expected from these types of cases, most victims did not know their assailants (over 95 %). In the course of the crime, some victims were physically injured (14 %) and a similar proportion were

Table 1 Sample characteristics

	CJ (n=103)	CJ+RJC [^] (n=89)
Burglary cases	71 (68.9 %)	59 (66.3 %)
Robbery cases	32 (31.1 %)	30 (33.7 %)
Females victims	60 (58.3 %)	45 (50.6 %)
Whites victims	89 (86.4 %)	75 (84.3 %)
Mean age at random assignment	38 (SD=13)	39 (SD=14)
Victim knew offender prior to crime	7 (6.8 %)	3 (3.4 %)
Victim was verbally threatened by offender during crime	12 (11.7 %)	16 (19.0 %)
Offender had a weapon	13 (12.6 %)	14 (15.7 %)
Victim was physically injured	13 (12.6 %)	15 (16.9 %)
Victim was psychologically traumatized	22 (21.4 %)	18 (20.2 %)
Mean time between offense and random assignment (months)	4.5 (SD=2.5)	5.0 (SD=3.1)
Mean time between offense and first interview (months)	5.2 (SD=2.6)	6.0 (SD=3.1)

CJ/criminal justice proceedings only; CJ+RJC criminal justice with face-to-face-restorative justice conferences

* $p<.05$

** $p<.01$

*** $p<.001$

verbally threatened by their offenders (15 %), and psychologically traumatized by their offenses (20 %).

Overall, we were able to capture PTSS data on both groups around 5 months after the date of the offense. As alluded to earlier, we did not encounter any missing observations (as this was one of our inclusion criteria for this study). Overall, these non-significant baseline differences imply that the treatment estimates are reliable, without having to resort to baseline data adjustments (see Ariel 2009).

Prevalence of clinical levels of PTSS following CJ plus RJC and CJ alone treatments

We were first interested in looking at the prevalence of clinical levels of post-traumatic stress symptoms (and possible PTSD), and whether there are fewer victims that suffer from such issues following a restorative justice conference compared to controls. Clinical levels of PTSS are defined as a score of 25 or more on the IES-R test. These outcomes are presented in Table 2 below, which also provides the total IES-R scores and the outcomes for each of the three subscales of the test, for each study group. The table lists these outcome measures at 1 month following random assignment and approximately 6 months following the criminal incident.

Post-treatment outcomes indicate a 49 % reduction in the number of victims with clinical levels of post-traumatic stress symptoms (and possible PTSD) in the RJC group compared with the control group (Table 2). In raw figures, there were 14 fewer victims who scored 25 or more on the IES-R test in the short term. This finding was statistically significant ($t(190)=2.163; p=.03$)¹

PTSS scores following

CJ plus RJC and CJ alone treatments

Looking closely at the distribution of IES-R subscale mean scores provides more precise understanding of the treatment effect. As noted earlier, IES-R contains three subscales that measure avoidance, intrusion, and hyper-arousal. These subscales are then added up into a total PTSS score.

Overall, the mean total score for the two study groups was 12.54 (SD=13.74) We observed lower IES-R scores in the experimental group across all subscales and in the global score in the follow-up period (Table 2). Significant reductions were found primarily in the intrusion and avoidance subscales, but not in the hyper-arousal subscale (Table 3). The t values displayed in Table 3 are the results of independent sample t tests for these comparisons (right-hand side column).

Effect size analyses

Collectively, these findings suggest a stronger overall treatment effect immediately after restorative justice conferences. In order to account for the magnitude of these

¹ Similar results were detected using chi-square statistics ($\chi^2=4.447; p=.035$)

Table 2 Post-treatment IES-R scores of CJ versus CJ+RJC participants

First PTSS survey	CJ (<i>n</i> =103)			CJ+RJ (<i>n</i> =89)		
	Mean	SD	Range	Mean	SD	Range
Clinical levels of PTSS ^a	24.30 %			12.40 %		
IES-R-avoidance subscale	5.45	6.37	0-23	3.53	5.12	0-24
IES-R- intrusion subscale	5.17	4.97	0-20	3.74	4.50	0-19
IES-R-hyper-arousal subscale	3.83	4.29	0-20	3.09	5.05	0-27
IES-R total score	14.44	13.95	0-57	10.36	13.22	0-66

CJ criminal justice proceedings only; *CJ+RJ* criminal justice with face-to-face-restorative justice conferences

^a IES-R \geq 25

differences, we measured the effects by looking at the standardized mean differences. Table 3 presents these findings, along with standard errors (SE), 95 % confidence intervals, and associated *z* scores for these comparisons. As shown, we observed overall significant small to medium effect sizes across the various subscales and total IES-R score. The largest effect size was found for victims' avoidance of the incident (SMD=.335; 95 % CI .049–.621).

Discussion

Undiagnosed PTSS in crime victims is a widespread but low-visibility public health problem (McCart et al. 2010). Clinical treatment for PTSS, even when available on a timely basis, depends upon self-referrals of crime victims, yet fewer than 8 % of burglary and robbery victims in our study requested any counseling in relation to the crime they suffered. An effective public health strategy for reducing crime-generated PTSS is likely to require proactive offers of treatment to victims as part of the standard criminal justice response to crime. In order to be viable, the treatment offered must also be low-cost and designed to fit the crime victim's convenience. Our results show that restorative justice conferencing led by police can satisfy all of these conditions, especially for more severe cases of clinical PTSS.

This study provides evidence that a police-led restorative justice conferencing program reduces the traumatic effects of crime for burglary and robbery victims in our assessment period. While normal recovery processes are presumably underway in the control group, RJC's may possibly provide a "booster" of cognitive processing by hastening the natural recovery process proposed by Horowitz et al. (1979). Such a finding would be consistent with the literature that single-session CBT "exposure"-based treatments have been shown to be effective in treating anxiety related disorders, including PTSD (Campbell 2012; Basoglu et al. 2007).

Our understanding of the impact of conferences on PTSS can be clarified in future research by collecting baseline assessments of PTSS prior to random assignment. This strategy was not available in the present study because victims' PTSS as an endpoint was not added as an outcome until this study had been underway for several months.

Table 3 IES-R Scores - statistical significance tests and effect size analyses

IES-R subscale	SMD	SE	95 % CI		z value	Sample size		t test values (p value)
			Lower limit	Upper limit		RJC	CJ	
Avoidance subscale	0.335	0.146	0.049	0.621	2.298	89	103	2.276 (.024)
Intrusion subscale	0.303	0.146	0.017	0.588	2.080	89	103	2.067 (.040)
Hyperarousal subscale	0.157	0.145	-0.127	0.441	1.083	89	103	1.091 (.276)
IES-R Total score	0.301	0.146	0.016	0.586	2.067	89	103	2.069 (.040)

The procedural decision not to collect baseline PTSS may have influenced our findings, since it is unclear how PTSS scores changed from pre-randomization to the interview, even though the same situation affected both the experimental and control groups. Our finding that control and experimental groups did not differ on victims' retrospective self-reported measures of offense characteristics related to violence, physical injury, or psychological trauma increases our confidence that PTSS would have been similar in both groups at baseline. Nonetheless, it is possible that there was a wide range of distress levels in our non-treatment seeking general crime victim sample entering the study based upon the natural recovery process over time. Foa and Meadows (1997) caution that this may cloud findings in outcome studies, since it may be more difficult to detect improvements in participants and psychopathology may begin at sub-clinical levels. Each scenario represents a bias that might minimize treatment efficacy or inflate its effects.

Overall, we detected a relative difference of 49 % fewer cases of clinical PTSS (possible PTSD) in the RJ group than in the control group. This demonstrates more robust findings than that of Schnurr et al. (2007) in the context of CBT. Multiplied across all robbery and burglary victims a year, having nearly half the overall prevalence of clinical PTSS as soon as possible is crucial. Face-to-face restorative justice, at least in this context, could translate into huge monetary savings in lost work, health care, and quality of life. It may even reduce mortality from coronary heart disease, if one assumes that IES-R results are similar to those obtained by Kubzansky et al. (2007) using the Mississippi Scale for Combat-Related PTSD.

The pooled sample of robbery and burglary victims shows a small to moderate effect size shortly after a face-to-face restorative justice conference (SMD =0.3). Group differences are largely attributed to significant differences detected in the avoidance and intrusion subscales of the IES-R, but not in the hyper-arousal subscale.

The small sample size and the short-term follow-up period limits the strength of our conclusions. This study can provide a workable framework for future research to address these longitudinal effects. Future field experiments could incorporate a mixed methods approach by combining ethnographic methods within the randomized field test, which has been described as "experimental ethnography" (Sherman and Strang 2004). A field experiment with longer follow-up periods, perhaps limited to subgroups of violent crime victims most likely to be affected by PTSD, could investigate the direct impact of RJ conferences on individuals with severe clinical cases of PTSS. Such a study could also include in-depth interviews of participants to understand more fully

their cognitive processing of the restorative justice experience. In doing so, we may develop a different understanding of the causal mechanisms engaged or explore individual variation from the average effect (Paluck 2010).

Reductions in PTSS scores and prevalence among crime victims provide evidence that RJ may be cost-justified by victim health effects. Thus far, the focus in this line of research offered valuable support for RJ from a crime perspective; for example, previous work detected an 8-to-1 benefit-to-cost ratio of RJ effects on reducing the frequency and cost of repeat offending (Shapland et al. 2008). It seems that replications of the present test with larger samples, longer follow-up, and specifically with financial data, could strengthen our understanding of the cost-saving implications of RJ from a “victim costs” perspective. Long-term follow-up of the present cases, and preferably cases from substantially larger RCTs, would yield even more precise estimates of the cost–benefit impact of providing RJC to specific victim populations.

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Conflict of interest We declare we have no conflict of interest.

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