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The Effectiveness of the Rewind Technique in Treating PTSD Symptoms of Intrusiveness and Avoidance in Violence Survivors

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Abstract

Objective: Post-Traumatic Stress Disorder (PTSD) is a disorder that dramatically affects the lives of many individuals and negatively impacts public health. Treating PTSD symptoms is often time-consuming, and exhausting for both victim and therapist. This article describes the initial results of a study aimed to test the three-month effectiveness of the Rewind Technique. The Rewind Technique is a therapy shown to reduce PTSD symptoms of Intrusiveness and Avoidance in one (in most cases) to three sessions without the victim being required to disclose details of the traumatic event. Being trauma-focused, the protocol aims to prevent the patient's involuntary recall (internal and external triggers) thus decreasing feelings of fear and anxiety yet retaining voluntary recall.

Method: Participants (N = 15; M_{age} = 36.13; 100% female) were recruited at a local anti-violence center. The study has a longitudinal design with four sections. In addition to the treatment section, three assessment sections have been devoted to detecting PTSD symptoms through the *PTSD Checklist for DSM-5* (PCL-5) and the *Impact Event Scale* (IES). The participants' symptoms have been assessed before and two times after treatment (two weeks and three months after).

Results: The data collected revealed that, irrespective of time from the traumatic event, thirteen (86.67%) of the fifteen women involved in the study had clinically significant reductions in PTSD symptoms two weeks after the treatment as it was equal to or greater than 7 points (i.e., clinically significant change). In addition, the comparison between PCL-5 scores pre- and three months after the treatment showed that, on average, at the last assessment, the score was significantly lower (z = -3.408; p<.001) and that 60% of the participants reported no diagnosis of PTSD.

Conclusion: Our results suggest that Rewind Technique is a particularly suitable technique to be used in contexts such as anti-violence centers, thanks to its features being fast, effective long term, and easy to impart. Despite limitations (i.e., low number of subjects involved, no use of a control group, only one psychologist treated all the participants), we hope that these encouraging results will prompt therapists and researchers to collect further evidence.

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1. Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, APA, 2013), a traumatic event implies that the individual experienced, witnessed, or was otherwise confronted with an event (or more than one) that actually involved or threatened death, serious injury, or other threats to the physical integrity of that person or others. Regarding this event, the individual experiences intense feelings of helplessness, fear or horror. As a consequence of having experienced or witnessed a traumatic event, some people suffer from Posttraumatic Stress Disorder (PTSD) which is a dynamic process in which phases of automatic reproduction of the memory of the event alternate with phases of automatic avoidance of that same memory (Horowitz, 1986). Thankfully, not all who experience trauma will go on to develop PTSD symptoms and some of those who do will recover over the first few weeks following the event (Bonanno, 2004; Creamer, 2000). However, even if it is difficult to estimate the real rate in the population, PTSD is a disorder that dramatically affects the lives of many individuals, negatively impacts public health and involves a substantial medical and economic burden (Watson, 2019; Hildebrand et al., 2017).

The DSM-5 (APA, 2013) describes 20 symptoms associate to PTSD, that can be grouped into four symptom clusters: Intrusion, Avoidance, Negative alterations of cognition and mood, and Alterations in arousal and reactivity (or Hyperarousal). The hallmark signs of PTSD are the *Intrusion* (or reexperiencing) symptoms cluster that includes nightmares, intrusive thoughts, and flashbacks. A second distinctive group of reactions refers to the *Avoidance* cluster, which comprises efforts to avoid memories of the traumatic experience and symptoms of emotional numbing. PTSD diagnosis is made when clinically significant distress or discomfort caused by the symptoms has persisted for a minimum of one month (APA, 2013). Despite the emerging and growing consensus on transdiagnostic approach (Dalgleish et al., 2020; Scull, 2021) and the current broad discussion on the definition of PTSD (Somma et al., 2019), our study focused on a therapeutic technique that acts on two symptom clusters (i.e., Reexperiencing or Intrusion and Avoidance) that are included in both the definitions of DSM-5 and ICD-11 and are shared by both basic PTSD and complex PTSD definitions (Maercker et al., 2013). As a consequence, we have chosen to refer to the DSM-5 clusters for consistency in our approach.

Many techniques for effective treatments for PTSD in children and adults have been proposed. Recently, Hamblen et al. (2022) have shown the superiority of the effectiveness of treatments trauma-focused psychotherapy compared to pharmacological therapies. The International Society for Traumatic Stress Studies published practice guidelines (Bisson et al., 2019) which

propose: acute interventions, cognitive behavioral therapy, psychopharmacology, eye movement desensitization and reprocessing (EMDR), group therapy, psychodynamic therapy, hypnosis, couple and family therapy and art therapies. A review conducted by Bisson and colleagues (2013) found that trauma-focused treatments are more effective than non-trauma focused treatments. More in detail, these researchers claimed that individual trauma-focused cognitive behavioral therapy (TFCBT) and EMDR are currently the recommended treatments of choice even if there is also support for the efficacy of individual non-TFCBT and group TFCBT. Other non-trauma-focused psychological therapies, such as non-directive counseling and psychodynamic therapy, seem to be not effective in terms of significant symptom reduction. However, due to the heterogeneity between the studies included in the review, Bisson et al. (2013) pointed out the need for caution in interpreting their results.

1.1 The Rewind Technique

The Rewind Technique (RT) is a reconsolidation-based therapy, using a trauma-focused imaginal exposure protocol. Reconsolidation is a neural mechanism for updating long-term memory, inserting new information that contradicts an essential element of the memory, which makes it possible to change the emotional tone and salience of the memory (Gray & Liotta, 2012; Wright et al., 2021). RT involves brief exposure to the trauma memory but does rely on conscious responses to correct the symptoms of PTSD and differs from conventional trauma-focused treatments in that it does not involve the need for the patient to reveal the details of the traumatic event to the therapist (unless the patient on her/his own initiative chooses to do so). This makes RT especially adequate for shame-based trauma, e.g., for sexual trauma (Troisi & Nunziante Cesàro, 2021). The RT is also referred to as "closure without disclosure" and as such is expected to diminish the risk of compassion fatigue for the therapist (Craig & Sprang, 2010). In most cases, one to three treatment sessions (usually 30-40 minutes), are expected to be sufficient to achieve a consistent decrease in the symptoms. The technique itself can be repeated various times during a session if the therapist does not feel the client has fully responded. Unbeknown to the patient, the therapist allows only a maximum of two minutes to perform the rewind and as such it can be repeated various times within a very short period of time. If the patient has suffered multiple traumas, RT can address more than one trauma in different sessions or possibly in the same session if the ongoing traumas are related, e.g., sexual abuse.

RT involves asking the clients to re-experience their involuntary recall of the traumatic event in their mind rather than verbally. After being introduced to the technique, the patient is invited

to close her/his eyes and the therapist asks the patient to imagine sitting in a cinema, where she/he watches a film showing a recording of the traumatic event as if it had been caught on camera. Rather than the film starts at the trauma itself, the participant was asked to imagine that the film starts just before the traumatic event took place, when all was well. This was then followed by the regular intrusive recall which included all the images, sounds and smells plus what could have happened next but did not. Once the recall ended, the patient is asked to imagine entering the film which, at this point, must be rewound very quickly to the starting point (Adams & Allan, 2018; Muss, 1991a). The aim is for the forward part of the process of recalling the trauma to last a few minutes and the rewind part about 10 seconds. The central element of the technique is that the patient sees and recalls the event from its beginning in a previously safe and detached starting point, thus allowing the reduction of the impact of emotions related to the traumatic event. Noteworthy, RT does not erase the traumatic memories, on the contrary, it offers a way of stopping the involuntary recall by providing a metaphorical safe, which the client can close and open only if she/he chooses to do so. This provides the control needed over the involuntary recall. If the patient is not the direct victim but rather an observer or first aider, the RT varies a little. It is, therefore, important to appreciate this difference. According to what is reported in RT protocol (Muss, 2002), the treatment should be undertaken if the Impact Event Scale (Horowitz et al., 1979) total score is higher or equal to 25. Additional information on RT is available at https://www.iartt.com/the-rewind/.

There have been some early clinical claims that support RT efficacy in reducing PTSD symptoms (Muss, personal communication) and a few pilot studies that collected preliminary evidence on the effectiveness of the technique. Firstly, evidence of the efficacy of the RT was reported by Muss (1991b) who treated 19 police officers suffering PTSD symptoms. Police officers, as well as military personnel, are people at high risk to develop PTSD (Platania et al., 2020). Most of the participants in Muss' study declared feeling better immediately after the intervention, saying that "they felt as if a great weight had suddenly been lifted" (Muss, 1991b, p. 92). A small number of officers did not remark on an immediate change, but all reported feeling well one week after the treatment and at further follow-up interviews (between three months and two years later), declaring no longer intrusive images. A second study was conducted with a group of survivors of the genocide in East Rwanda, that had taken place 14 years before (Utuza et al., 2012). A single intervention group therapy session was applied to 21 participants. The results showed a statistically significant reduction of intrusion and avoidance symptoms (assessed by means of the Impact Event Scale; Horowitz et al., 1979) two weeks after the treatment in 85% of those attending it. Only one participant, out of 21, showed no change

at the post-intervention assessment and two scored higher. More recently, Adams and Allan (2018) recruited 63 participants (mainly female) suffering from PTSD symptoms and additional problems (i.e., anxiety and specific phobias) from three different clinical settings treating a wide range of traumas, both acute and chronic. All the clients individually attended an RT session and at the post-treatment assessments of PTSD symptoms, 86% of the participants showed clinically significant changes. In this study, in the three groups of participants the scores of intrusion and avoidance symptoms following the RT significantly decreased with large effect sizes that ranged from $r = .62$ to $r = .65$. The researchers reported that the participants with the least severe symptoms tended to have the lowest post-intervention scores in the PTSD symptoms assessment, while those with the most severe pre-treatment scores showed the greatest improvement (Adams & Allan, 2018). But, they also realized that the clients with acute trauma (and the highest scores in the pre-intervention assessment) showed the greatest improvements. In Adams and Allan's study, the post-treatment assessment took place two weeks after the RT. Taken together, these observations suggest that the RT is effective, regardless of the nature of the trauma or the temporal distance of the event that caused it. Recently, Hartfor and Horrocks (2023) conducted interviews to explore the experiences of ten UK participants who have been treated with RT for help with symptoms related to previous traumatic experiences. Participants reported that RT helped in reducing the impact of negative emotions when recalling traumatic events and also decreased the frequency of involuntary recall. Participants noted broader positive changes in their quality of life after the treatment. However, further evidence is needed, especially in relation to the three-month effectiveness of the technique.

1.2 The rationale for the use of Rewind Technique in anti-violence centers

PTSD may develop as a result of having experienced an accident or a natural disaster, or, often, a consequence of having been the victim of violent acts or aggressions. In this case, many victims, especially female victims, look for support and help at anti-violence centers (Pomicino et al., 2019; Romito et al., 2022) that have been created with the aim to offer various services (e.g., telephone reception, personal interviews, psychological and legal support, and hospitality in so-called shelters) to victims of domestic, sexual, economic, and stalking violence, in order to support them in the emergence and in the process of exit from their situations of violence. Notwithstanding the positive evaluation by the clients (Bennett et al., 2004), anti-violence centers in Italy are facing serious difficulties as the financial support from the State or local governments is insufficient, and some centers are in danger of having to close (Pomicino et al.,

2019). As a consequence, operators of anti-violence centers are often called upon to take care of a very large number of clients.

Although the anti-violence centers provide help to anyone who experienced any kind of violence, the majority of their clients are women (Pomicino et al., 2019), and for those suffering from PTSD, managing the symptoms is the beginning of the path out of violence. The treatments most recommended to be used to recover from PTSD symptoms require many sessions, covering considerable periods of time (e.g., Elklit, 2009) and this is a problem because the clients, either of their own volition or for external causes, tend to break off all contact with the center's operators a few weeks after the first request for help. A simple, easily reproducible technique, that could inactivate the repetitive intrusive imagery of the traumatic event could be a very useful tool that would imply advantages for both the clients and the therapists in treating victims of assault and violence at these centers. As the features of the RT seem particularly suitable for anti-violence center counselors and psychotherapists working with several clients who are very frequently exposed to their patients' heavy psychological suffering, and consequently are at high risk for burnout (Steel et al., 2015), we used RT with people suffering of PTSD symptoms who asked for help at an anti-violence center and in the present article the first results regarding its use are described.

1.3 The present study

This article describes the initial results of a study aimed to test the efficacy of the RT three months (at least) after the treatment. The three-month efficacy of RT has never been systematically investigated before. As RT is a treatment focused on the symptoms included in two of the PTSD clusters reported by DSM-5 (i.e., Intrusiveness and Avoidance), the second aim of this study is to explore whether the set of symptoms described for PTSD by the DSM-5 decrease in intensity overall as a consequence of the reduction of intrusive images related to the traumatic event. Finally, as traumatic events experienced by clients who ask for help from the anti-violence centers often involve sexual violence, an additional aim of this study is to test if RT is also effective when the trauma has a sexual nature.

2. Method

2.1 Procedure and design

This study used a longitudinal design to investigate the effectiveness of RT at two time points: two weeks and three months post-treatment, in a group of women who approached an anti-violence centre following a traumatic event. Data were collected between February 2019 and

July 2021. The participants have been recruited at a local anti-violence center. All participants received information about the study and gave their consent before starting the survey. Their anonymity was guaranteed by means of a code that was used in order to associate the assessments of the various phases of the study. This identification code, without any reference to the patient's name, has been assigned to each participant by one of the psychologists working at the center who was in charge of that person.

Victims, who requested help by voluntarily contacting the center, declaring that they had experienced an event involving violence or suffered some type of violent aggression, underwent one or more interviews with the psychologists. When the psychologist, who was in charge of the client, hypothesized the presence of PTSD and the traumatic event had occurred at least one month before, the person was assessed for PTSD symptoms (T0). If the score revealed the presence of PTSD symptoms, the person was eligible, and she/he was offered to participate in the study. Subsequently, the consent was obtained and then measurements and treatment were administered in four sessions, organized according to the following scheme:

T1 - Administration of the PTSD symptom measurement tool that the RT protocol specifically indicates as a means of detecting any reduction in symptoms treated with the technique (i.e., Intrusion and Avoidance) (see below in "Measures" section);

T2 – treatment (RT);

T3 – post-treatment evaluation of symptoms of Intrusion and Avoidance (about two weeks after RT);

T4 – post-treatment evaluation of PTSD symptoms (about three months after RT).

This study was approved by the Comitato Etico per la Sperimentazione Clinica delle province di Verona e Rovigo, (protocol number: 27115). All the participants were previously informed about the aims of the study and gave their written informed consent to participate in the study.

2.2 Measures

The participants filled out the following measures.

PTSD Checklist for DSM-5 (PCL-5) is a 20-items validated and widely used self-report measure that assesses the symptoms of PTSD on the bases of the criteria reported in the DSM-5 (Blevins et al., 2015; Negri et al., 2022; Weathers et al., 2013). These items refer to repeated, disturbing, and unwanted memories related to the stressful experience that occurred in the past month and can be divided into four subscales corresponding to the clusters B-E in the DSM-5: Intrusion (five items), Avoidance (two items), Negative alterations in cognitions and mood (seven items),

and Alterations in arousal and reactivity (six items). An example of items is: "In the past month, how much were you bothered by: Repeated, disturbing, and unwanted memories of the stressful experience?". Each item is assessed by means of a 5-point Likert scale (from 0 = "Not at all" to 4 = "Extremely"). The PCL-5 takes approximately 5-10 minutes to complete. In this study, the internal consistency (α) for the sub-scales (at the first administration) ranged between .632 and .947. The total symptom severity score (range: 0-80) can be obtained by summing the scores for each of the 20 items. A cut-off score between 31-33 is recommended as indicating PTSD: a score of 33 or more was used as the inclusion criterion for participation in the study. The PCL-5 showed satisfactory psychometric properties, internal consistency, test-retest reliability, and convergent validity (Bovin et al., 2016; Sveen et al., 2016). At the T0 session of the study the PCL-5 has been preceded by four questions relating to the traumatic event: 1) Has anyone risked their life? (2 = my life; 1 = someone else's life; 0 = no); 2) Has anyone been seriously injured or killed? (2 = I was seriously injured; 1 = someone else was seriously injured or killed; 0 = no); 3) Did the event involve sexual assault? (Yes = 1; No = 0); 4) If the event resulted in the death of a family member or close friend, was this caused by accident or violence, or by natural causes? (2 = accident or violence; 1 = natural causes; 0 = not applicable). The PCL-5 is a widely used measure for the assessment of PTSD symptoms and for the evaluation of the effectiveness of treatments and the the guideline for the diagnostic use (Weathers et al., 2013) suggests that 5 points are the minimum threshold for determining whether a person has responded to treatment and 10 points is a minimum threshold for determining whether the change is clinically meaningful (Reliable Change Index, RCI). The PCL-5 was administered twice to each client, at T0 and at T4 to detect the potential change. When the project was drafted (between 2017 and 2018), from the available validated self-report instruments (e.g., Bardhoshi et al., 2016), we opted for the PCL-5 as it was the most familiar to the psychologists responsible for assessing clients' PTSD symptoms at the centre.

The *Impact Event Scale* (IES) is a validated and widely used 15-item self-reported questionnaire (Pietrantonio et al., 2003) created by Horowitz et al. (1979) that measures the frequency with which intrusion and avoidance are experienced in the aftermath of a distressing event. The items are distributed across two subscales: Avoidance (eight items; e.g., "I tried to remove it from memory") and Intrusion (seven items; e.g., "I thought about it when I did not mean to"). The participant is asked to answer each item referring to the last seven days. The response scale is a 4-point Likert scale (0 = "never"; 1 = "rarely"; 3 = "sometimes"; 5 = "often"). Psychometric proprieties of the IES are well-documented (Coffey et al., 2006; Horowitz et al., 1979; Joseph, 2000; Newman et al., 1996; Robbins & Hunt, 1996) and it is widely used for the assessment of

PTSD symptoms of Intrusiveness and Avoidance. The IES is the instrument specified by the RT protocol (Muss, 2002) to determine whether the patient is eligible for RT treatment. The range of the total score is 0-75 and a score of 35 or above is typically indicative of high clinical stress (Joseph, 2000). However, according to the RT protocol (Muss, 2002), the treatment should be undertaken if the client's IES score is 25 or above. A reduction of 7 points (RCI) between the total score of the IES administrated before and after treatment indicates a clinically significant change (Devilly & Foa, 2001). The IES was administrated to each participant of this study at T1, T3 and T4. In this study, the internal consistency for the Avoidance sub-scale and Intrusion sub-scale (at the first administration) were respectively, $\alpha = .811$ and $\alpha = .874$.

Demographic variables and information about the traumatic event. Participants were asked to indicate their age and gender. In addition, they reported the nature of the traumatic event (aggression/violence, accident, natural disaster or other) and when it had occurred (the year and possibly the month). No additional information has been collected in order to guarantee the anonymity of each participant.

2.3 Participants

Fifteen women completed the study. It is important to note that ten additional female victims of assault or violence participated in two or more phases of the study (40% of all women initially involved). However, these participants during the study period severed their relationship with the center and it was no longer possible to trace them to conclude the data collection and investigate the reasons for leaving. Consequently, these participants were excluded from the study. The t-test and chi square analyses referring to age, time distance from the traumatic event and PTSD symptoms between two groups (i.e., women who dropped out and the 15 participants) resulted not significant.

All the participants who took part in study were adults with a mean age of 36.13 years (*SD* = 13.70; range: 18-61 years). With reference to the type of traumatic event they reported, five women reported having suffered an assault, four declared they had experienced violence, one of the participants reported that she was arrested and five preferred to omit the type of traumatic event they experienced. Seven participants risked their life during the traumatic event and six women reported that it included sexual violence. Twelve participants reported the period in which the event happened. The range of the gaps between the traumatic event and the T0 session resulted quite various: the average period lasted 40.25 months (*SD* = 88.62; min = 1, max = 312).

2.4 Statistical analyses

The analyses were carried out with the use of the software Statistical Package for Social Science (IBM-SPSS, version 26.0). Firstly, correlations of the scores of the PCL-5 and the IES at the various assessments were run. Afterward, descriptive statistics and the differences between individual scores of each session were computed. In order to compare the scores between groups and between the scores of the same participant in the various sessions, respectively, the T-test (for independent samples) and the Wilcoxon test were used. As a consequence, in this study, the PCL-5 and IES scores were treated as dependent variables, while the various assessment sessions served as independent variables. No covariates were considered in the analyses. Pre-treatment scores were also related to the temporal distance from the traumatic event by means of the *r* Pearson correlation index. For all the analyses the significance criterion was set at $p < .05$.

3. Results

Depending on the center's schedule and on the willingness of each client, the first post-treatment assessment (T3) has been made on average 23.86 days (*SD* = 16.59; min = 14 days; max = 77 days) after the treatment (T2) and the second post-treatment assessment (T4) on average 123.40 days (*SD* = 27.22; min = 80 days; max = 174 days) after the RT session. One therapist, who was not the psychologist who made the assessment of PTSD symptoms, treated all the participants.

The PCL-5 and IES scores resulted positively correlated within each session (pre-treatment: $r = .533$; $p < .05$; T4: $r = .688$; $p < .01$). Also, pre-treatment and follow-up scores of PCL-5 and IES, respectively, resulted significantly and positively correlated (PCL-5: $r = .656$; $p < .001$; IES: $r = .647$; $p < .001$), whereas the association between IES scores at T1 and IES scores at T3 showed to be positive but lower and not significant ($r = .433$; *ns*). Also, correlations between the time from the traumatic event and the PCL-5 and IES scores at the start of the study were not significant.

Table 1 shows the PCL-5 and IES scores for each participant at T0, T1, T3 and T4 sessions. In addition, column 4 shows the differences in the PCL-5 scores between T4 and T0, columns 8, 9, 10 report the differences between IES scores related to the various administration sessions.

Table 1. PCL-5 and IES scores at T0, T1, T3 and T4 and differences between the various assessments.

Participant	**T0 PLC**	**T4 PLC**	**T4-T0 PLC**	**T1 IES**	**T3 IES**	**T4 IES**	**T3-T1 IES**	**T4-T3 IES**	**T4-T1 IES**
1	39	13 [b]	-26 [a]	38	22 [d]	23 [d]	-16 [c]	1	-15
2	60	46	-14 [a]	71	56	49	-15 [c]	-7	-22
3	71	62	-9	68	48	65	-20 [c]	17	-3
4	61	54	-7	24	47	10 [d]	23	-37 [c]	-14
5	46	18 [b]	-28 [a]	57	34	15 [d]	-23 [c]	-19 [c]	-42
6	54	43	-11 [a]	57	35	29	-22 [c]	-6	-28
7	42	7 [b]	-35 [a]	24	10 [d]	13 [d]	-14 [c]	3	-11
8	55	7 [b]	-48 [a]	34	28	6 [d]	-6	-22 [c]	-28
9	68	44	-24 [a]	51	27	31	-24 [c]	4	-20
10	49	13 [b]	-36 [a]	45	47	41	2	-6	-4
11	54	3 [b]	-51 [a]	51	27	8 [d]	-24 [c]	-19 [c]	-43
12	48	4 [b]	-44 [a]	21	4 [d]	5 [d]	-17 [c]	1	-16
13	68	45	-23 [a]	52	33	37	-19 [c]	4	-15
14	69	12 [b]	-57 [a]	63	6 [d]	12 [d]	-57 [c]	6	-51
15	54	16 [b]	-38 [a]	45	36	13 [d]	-9 [c]	-23 [c]	-32
Mean	55.87	25.80		46.73	30.67	23.80			
Wilcoxon			-3.408 (p<.001)				-2.699 (p=.007)	-1.593 (*ns*)	-3.409 (p<.001)
Bonferroni's Adjustment			(p<.001)				(p=.021)		(p<.001)

[a] *RCI* > 10 = clinically significant change for the PCL-5.
[b] Sub-threshold scores for the PCL-5.
[c] *RCI* > 7 = clinically significant change for the IES.
[d] Sub-threshold scores for the IES.

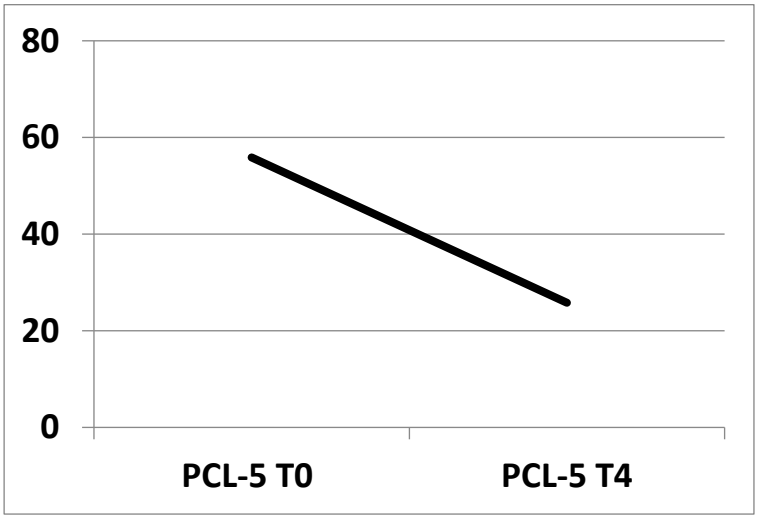

Figure 1. PCL-5 mean scores of the participants at T0 and T4 sessions

The PCL-5 scores assessed at the T4 session, compared with those at T0, show that on average the total T4 score is significantly lower than that at T0 (z = -3.408; p<.001; Table 1 and Figure 1). Inspection of Table 1 (column 4) shows that in all participants there was a decrease in the PCL-5 scores at the T4 assessment revealing a reduction in PTSD symptoms; for thirteen of the clients (86.67%), this effect was clinically significant as it was equal to or greater than 10 points. Furthermore, at T4, nine participants reported a total PCL-5 score that is less than 33 (Table 1, column 3), indicating no persistence of PTSD symptoms at T4. The comparison of the scores of the PCL-5 subscales (Intrusion, Avoidance, Negative alterations in cognitions and mood, Hyperactivation) at the pre-treatment session (T0) and post-treatment session (T4) revealed that the clients' improvement referred to all the dimensions assessed. Indeed, Wilcoxon's z indexes are respectively: -3.411 (p < .001); -2.772 (p < .01); -3.412 (p < .001); -3.271 (p < .001).

With reference to the IES scores, at the pre-treatment assessment (T1), three clients (i.e., participants 4, 7 and 12) scored slightly below the threshold. However, as they had a PCL-5 score greater than 33, these participants have been included in the study to test if the effects of the treatment were different in the case of sub-threshold scores. According to the short-time post-intervention assessments (T3), 80% of the participants showed to benefit from RT, and data collected at T4 session confirmed this enhancement, as the reduction of symptoms of Intrusion and Avoidance continued after T3 assessment, although, understandably, to a lesser extent (Table 1 and Figure 2).

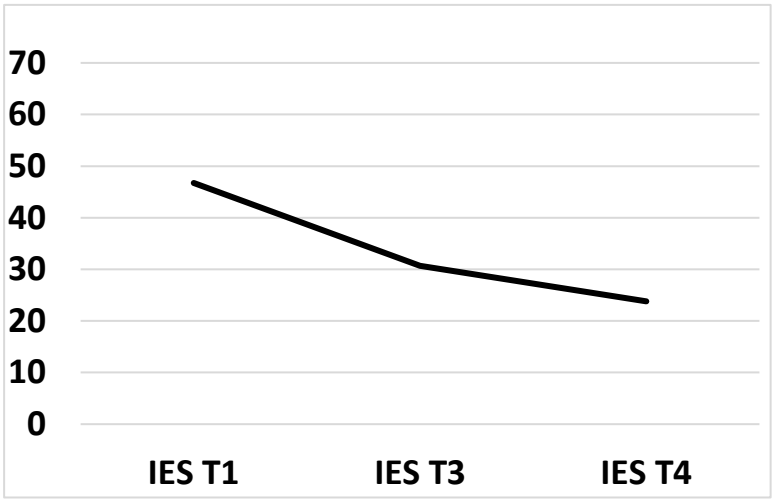

Figure 2. IES mean scores of the 15 participants at T1, T3 and T4 sessions.

Analyzing the IES scores of each participant individually alongside all observation periods (Table 1, columns from 5 to 7), emerged that eight clients reported a clinically significant decrease in the score at T3 and then they maintain a similar score at T4 assessment (i.e., no clinically significant change between T3 and T4). Two of them had a sub-threshold IES score at T1 (respectively 24 and 21). Other three clients reported a clinically significant decrease in their score in both the post-treatment assessments (T3 and T4). Participant 3, reported a clinically significant decrease at T3 but a significant increase at T4, revealing an IES score similar to that reported at the pre-treatment session; this is the only case, among participants, in which the traumatic event resulted in the death of a person in close relationship with the client. On the contrary, participant 4, who had a sub-threshold score of 24 at T1, reported a consistent increase at T3, but subsequently, there was a clinically significant decrease at T4 when she reaches a sub-threshold score lower than that reported at T1. Finally, participant 8 reported an insignificant decrease at T3 but the reduction of the T4 score was clinically significant and brings the IES total score below the threshold and participant 10 did not report any clinically significant reduction of the IES score, even if she reported a sub-threshold PCL-5 score at T4. Noteworthy, participants 3 and 4 are the two clients who did not report any significant improvement in the PCL-5 score, even if, with reference to the IES total score, both reported a significant improvement in one of the two post-treatment sessions.

Pre-treatment and post-treatment scores of PCL-5 and IES of the six clients who suffered sexual violence have been compared to those who did not. Only the comparison of the IES scores at T1 resulted marginally significant (t = -2.198; p = .047) with the group of women who experienced sexual violence scoring higher. After the RT, this difference disappears.

4. Discussion

This study on victims of aggression and violent acts aimed to collect data regarding the efficacy of the RT in the short-term and after three months. RT is a trauma-focused imaginal exposure protocol that deals with the patient's fear-evoking stimuli, to diminish feelings of fear and anxiety. Fifteen clients, recruited in an anti-violence centre, who reported high levels of intrusiveness and avoidance as a consequence of having experienced a traumatic event in the past, were treated with RT. Most of them reported a significant decline in the targeted symptoms, and upon comparing average pre-treatment and post-treatment scores of PCL-5 and IES, significant differences emerged.

People looking for help at anti-violence centers have been victims of assault and violence and, consequently, many are likely to suffer from PTSD symptoms. A treatment technique that can

rapidly inactivate the repetitive intrusive imagery of the traumatic event is a clear advantage for the victims themselves and could be a very useful tool for therapists who have to manage a large number of seriously distressed clients. The above-mentioned features of RT, particularly the opportunity to treat one or more traumas in one or a few short sessions, are features that make this technique particularly suitable for clients and therapists of anti-violence centers. In addition, as highlighted in other studies (Adams & Allen, 2018; Utuza et al., 2012), RT can be used on Intrusiveness and Avoidance symptoms following different traumatic events. Therefore, it could be useful in many other cases, for example in supporting road accident victims (Burrai et al., 2021). As Olff and colleagues (2019) noted, there is an urgent need to develop effective treatments that are shorter in duration. We are aware that RT is not the only treatment that showed efficacy in reducing the symptoms of intrusiveness and avoidance (e.g., EMDR, BPS; see, Hildebrand et al., 2017) and that it may not be effective for everyone (Utuza et al., 2012). However, what we would like to emphasise here is that RT can have the same effects as other treatments more quickly as its use showed that, in most of the participants of this study, a single session was sufficient to achieve a significant reduction in symptoms.

Overall, after the RT, the clients reported an immediate benefit: many of them declared to the therapist to feel relieved at the end of the treatment and in the weeks after the RT session, symptoms of intrusion and avoidance decreased. These improvements are confirmed over time with further reductions in (or maintenance of post-treatment levels of) intrusiveness and avoidance at follow-up assessments. Symptoms of depression and hyperarousal also show decreases after treatment. We can hypothesise that the effectiveness of RT in reducing symptoms quickly is attributable to the fact that when the involuntary recall of the traumatic event can be stopped, the survivors are able to recover rapidly (Muss, 1991b). Indeed, intrusiveness and avoidance are associated with anxiety (Dymond et al., 2018), depression (Dancey & Friend, 2008), and maladaptive cognitive emotion regulation (i.e., use of strategies like catastrophic thinking, rumination, etc.). For example, Liu et al. (2020) found that high intrusive symptoms were associated with global emotion dysregulation. Thus, once the individual controls the intrusive images also the other maladaptive processes seem to turn out. The recovery may allow the person who experienced the traumatic event to use his/her personal resources (e.g., resilience; see, Platania et al., 2020) which can aid in overcoming the distressing trauma effects and improve quality of life. The effect of RT on decreasing the other symptoms assessed by means of PCL-5 (e.g., depression) could also be explained by the fact that blocking or reducing intrusiveness contributes to increased individual perceived control (i.e., appraise symptoms as more controllable or enhancing personal sense of self-agency). Low perceived

control has been shown to be strongly and positively correlated with disorders such as depression (Myles et al., 2020; 2021) and with poorer outcomes following trauma exposure and treatment (Dunmore et al., 2001; Frazier et al., 2001 Kleim et al., 2007; Livanou et al., 2002). For instance, Hancock and Bryant (2018) conducted a study in which they manipulated the perceived controllability of an aversive stimulus in participants with and without PTSD. They found that avoidance and distress are the symptoms most affected by the controllability and predictability effects of the stimulus.

The short-term effectiveness of RT was observed for 86.7% of the clients, regardless of their initial level of intrusiveness and avoidance. Indeed, data revealed that the association between the scores of the IES (the instrument assessing the patient's levels of intrusiveness and avoidance, indicated by the RT protocol for evaluating the effectiveness of the treatment) at T1 and T3 is positive but lower than that between T1 and T4, suggesting that the short-term improvement (symptom reductions) tends to be less dependent than long-term improvement on the initial level of intrusive and avoidant symptoms. Three months after the treatment (long-term assessment), many factors (potentially also other traumatic events) may have intervened and this may have contributed to a less pronounced attenuation trend of the components of post-traumatic stress in accordance with the initial distress levels: our study did not include any measurement of these potential factors, but future research could investigate whether and how subsequent life experiences might affect the patient's levels of intrusiveness and avoidance related to the traumatic event treated with RT.

Our results are in line with previous observations regarding the effectiveness of RT. Echoing Utuza and colleagues (2012), who used RT in a group session with male participants, we showed that RT can reduce PTSD symptoms even long after the traumatic event has occurred. Aligning with the results of Adams and Allen (2018), we found that participants of our study who reported the highest pretreatment scores showed greater improvements in post-treatment sessions. With reference to the reduction of symptoms, the objection can be raised that the passage of time contributes to this. For example, this may be suggested by the post-treatment scores of participants 4 and 8 for whom RT has had no short-term but only long-term efficacy. We cannot exclude that, for all clients, the time elapsed between T0 and T4 contributed to reducing the intensity of symptoms. However, it is relevant to highlight that in some of the participants who reported benefits from the treatment, their trauma went back a long time, even years (e.g., as regards participant 2, her trauma was caused by an event that happened 26 years before the treatment), as in the case of the participants of the study conducted by Utuza et al.

(2012). In order to evaluate the influence of the passage of time, studies implying control groups are needed.

Nevertheless, as suggested by Utuza et al. (2012), there might be a minority of people for whom RT would be inappropriate, hence, with the aim to deeply explore when RT is more or less effective, analyses of single cases have been conducted. This exploration highlighted that RT seems to be effective if the client is able to detect a specific event in the past as the cause of the trauma. For example, participant 10 did not have any significant reduction in intrusive and avoidance symptoms, even if she reported a general improvement at T4 (she reported a sub-threshold PCL-5 score some months after RT). This client had declared to suffer "violence at work", implying continuous harassment, which was assumed to have ended, but during the weeks subsequent to the treatment, it emerged that the harassment was ongoing. This confirms that RT is not expected to be used when the traumatic situation is still ongoing, as in this case. Participant 3, who showed a clinically significant improvement in the symptoms in the weeks after the treatment, was the only client whose intrusiveness and avoidance scores increased three months after RT. A first explanation for this result might derive from the fact that among all the clients of the anti-violence center who participated in the study, this client was the only woman who, experienced the traumatic event as an observer. As a consequence, as suggested by Muss (1991a) the RT would have to have been different. A second potential explanation is that the client was significantly depressed so faked participation being unable to fully focus. This hypothesis is supported also by the observation that she has a long-term relationship with the anti-violence center (i.e., when she was recruited for the study following her traumatic event, she had already been a client of the anti-violence center for several months). Also, in the case of participant 3, as for participant 10, it should be emphasized that the treatment was not helpful but did not make the patient worse.

As regards the comparison between those clients who suffered sexual violence and those who did not, the results suggest that when a woman experiences an event implying sexual violence, she has higher intrusive and avoidant symptoms of PTSD. However, after the RT this difference disappeared, showing that the technique is effective regardless of the sexual nature of the traumatic event. To sum up, RT showed to be a PTSD treatment technique that in most cases helps clients of anti-violence centers (regardless of the type of their trauma) to overcome their symptoms and that in case it is ineffective does not worsen the client's condition. Beyond the encouraging evidence emerging from clinical studies, the clinical implications must be discussed with caution. Additionally, even with reference to RT, further evidence will be needed to

substantiate its efficacy. Furthermore, future investigations could elucidate how and why RT is effective: currently, the underlying mechanism of RT remains unclear.

With reference to the use of the assessment instrument used in the present study, except in very few cases (i.e., participants 4 and 10), overall, the evaluations of PCL-5 and IES appear strongly in agreement as eight clients were sub-threshold in both measures and five clients reported supra-threshold scores in both the assessments. Only in the cases of participant 4 (the only patient who reported an increase in IES at T3) and participant 10 (who suffered "violence at work") did their scores result in one sub-threshold (IES for patient 4 and PCL-5 for patient 10) and the other supra-threshold (IES for patient 10 and PCL-5 for patient 4) (see Table 1). However, in line with the results of Coffey et al. (2006) who provided evidence that the total score from IES can be used to assess PTSD symptoms in motor vehicle accident survivors, the results of the correlation between the PCL and IES scores of this study confirm that the IES is adequate for the evaluation of PTSD symptoms and their overcoming in the case of a traumatic event due to violence or aggression. In addition, with reference to the criteria of the IES score > 25, data seem to suggest that also lower scores of Intrusion and Avoidance would be adequate for applying the RT with symptom-reducing effects. The client (i.e., participant 4) who showed an immediate increase in symptoms also achieved a sub-threshold score at T4. Further analyses are needed to test if the IES cut off for RT could be 20 instead of 25.

5. Strengths and limitations

This pilot study is the first to test the use of RT for clients in the anti-violence centers and provides preliminary indications of the effectiveness of the technique. Nevertheless, this study is not without limitations. Firstly, one limitation refers to the low number of subjects involved, who were not randomized. In addition, at present, data from the control group (planned in the overall experimental design) are not yet available. As such, the data do not allow definitive conclusions to be drawn, but do encourage further exploration of the effectiveness of the treatment. Moreover, data on participants' ethnicity was not collected in order to respect anonymity. Finally, only one psychologist (personally trained by Dr. Muss) treated all the participants. Future studies with a larger number of participants may also check the possible effects of using different therapists and overcome all these limitations.

6. Conclusions

RT seems a particularly suitable technique to be used in contexts such as anti-violence centers, thanks to its features being fast, effective long term and easy to impart. However, these features make RT suitable for the use in many other contexts in which treatments that are short in

duration are advisable. This study aimed to add to minimal existing research on RT efficacy, data on the long-term effect of the treatment. Results suggest that, after the treatment most of the clients involved experienced an improvement in their quality of life. Additional research, also implying control groups and larger and various samples, is needed to confirm the efficacy of the technique, to better understand when and why it does not work and to clarify the mental mechanisms involved (Merlo et al., 2022; Myles, 2021). We hope the encouraging results of this study will prompt therapists and researchers to collect further evidence.

Ethical approval

This study was approved by Comitato Etico per la Sperimentazione Clinica delle province di Verona e Rovigo (CESC): protocol number: 27115 dated 15th February 2019, approval of the clinical study entitled "David Muss' Rewind Trauma Therapy Efficacy Study" - REWIND 2027 CESC. All the participants gave their written informed consent to participate in the study.

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of interest statement

The authors declare that there is no conflict of interest.

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Authors' contributions

Study design: AM.M., S.P., D.M.; Data collection: AM.M., S.P.; Statistical analysis: AM.M., S.M.; Data interpretation: AM.M., S.P., D.M.; Manuscript preparation: AM.M., S.P., S.M., D.M.; Literature search: AM.M., S.M., D.M.

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