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Injured body, injured soul? Predicting and preventing posttraumatic stress disorder after injury

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CHAPTER 4: Design and Pilot Study of an Internet-Based Preventive Intervention for PTSD

ABSTRACT

In the prevention of posttraumatic stress disorder (PTSD) after severe traumatic injury, easily applicable, accessible, cost-efficient early interventions are needed that use well-established techniques for decreasing acute psychological stress reactions. Whereas most studies delivered cognitive behavioral techniques face-to-face or as a curative treatment, we incorporated them into a brief internet-based early intervention to reduce acute psychological distress and prevent long-term symptoms of PTSD in trauma victims. By means of interactive elements, visual and auditory materials, the intervention contains psychoeducation, modeling, in vivo exposure, stress management and social support. In this article, we describe the design of the program and the outcomes of an initial feasibility study among trauma patients \( (n = 5) \) and healthy controls \( (n = 5) \). The participants reviewed the program as useful and clear. Neither patients nor controls experienced adverse psychological reactions after completing the intervention. The results show that the intervention is well-received and feasible for implementation in severely injured trauma survivors.
4.1 INTRODUCTION

Following traumatic injury, many patients find themselves facing more than their physical recovery. Previous studies have shown that sizeable percentages of trauma patients develop psychiatric symptoms as a result of their traumatic experiences, such as posttraumatic stress disorder (PTSD). One to six months post-injury, reported rates of PTSD vary from 17.5% to 42% (Ehlers, Mayou, & Bryant, 1998; Harvey & Bryant, 1998; Michaels et al., 1999; O’Donnell, Creamer, Pattison, & Atkin, 2004; Shalev et al., 1998; Yehuda, McFarlane, & Shalev, 1998). PTSD is a severe and disabling disorder associated with considerable personal suffering and psychobiological abnormalities due to a deregulated stress system, functional impairment, and a high economic impact (Walker et al., 2003).

To prevent the development of PTSD in trauma victims, several types of brief early interventions have been developed. The most frequently applied early psychological intervention after trauma, the single-session psychological debriefing, does not prevent the onset of PTSD and may even increase the risk for PTSD in some survivors (Rose, Bisson, & Wessely, 2003; Sijbrandij, Olff, Reitsma, Carlier, & Gersons, 2006; van Emmerik, Kamphuis, Hulsbosch, & Emmelkamp, 2002). It has been suggested that the emphasis on expressing emotions related to the trauma, which is a usual part of most acute interventions following psychological trauma, may exacerbate and sustain arousal, which may cause PTSD symptoms to escalate rather than to decrease (Sijbrandij et al., 2006). Therefore, recent guidelines advocate against the use of such trauma-focused early interventions for everyone involved in the traumatic event (National Institute for Clinical Excellence; NICE, 2005). Up to date, no evidence-based alternatives exist to prevent PTSD in trauma-affected populations shortly after the traumatic event.

Instead, it has been suggested that future early interventions in trauma populations should focus on reducing hyperarousal and consist of ‘psychological first aid’, such as psychoeducational materials about normal and abnormal reactions to trauma and about the various available care options (Gray & Litz, 2005). Lacking thorough research, psychological first aid still remains an evidence-informed, rather than an evidence-based intervention. Stronger support has been found for the use of trauma-focused cognitive behavioral therapy (CBT) in the treatment of Acute Stress Disorder (ASD) and acute PTSD in injury populations (see Roberts, Kitchiner, Kenardy, & Bisson, 2009, for an overview). Cognitive behavioral techniques include psychoeducation about individual reactions to traumatic events, stress management techniques (i.e. relaxation exercises), exposure, and cognitive restructuring. Although trauma-focused CBT usually consists of 4 to 5 sessions, there is some evidence indicating that only 1 CBT session is useful in the treatment of PTSD in Turkish earthquake survivors (Basoglu, Salcioglu, & Livanou, 2007). In addition, a recent pilot feasibility study in which a single exposure therapy session was delivered to injury victims in the emergency department (ED) within 24 hours after experiencing trauma, showed that patients receiving this intervention were rated lower on clinician-
rated global severity of symptoms than patients in the assessment-only condition (Rothbaum et al., 2008).

The internet may provide a useful medium in delivering early interventions to recently trauma-exposed populations. E-Mental health interventions are considered a cost-effective variant of traditional interventions (Kaltenthaler et al., 2006). In addition, the accessibility of the internet, its interactivity and low-threshold could be beneficial features in the delivery of care to injured trauma survivors. For the treatment of chronic posttraumatic stress symptoms, several internet-based interventions have been developed, demonstrating feasibility (Litz, Williams, Wang, Bryant, & Engel, 2004) and efficacy (Hirai & Clum, 2005; Lange et al., 2003). However, few initiatives have yet been undertaken using the internet as a medium for the prevention of PTSD. A pilot study of a preventive internet-intervention that addresses mental health (among which PTSD) and substance abuse in disaster populations showed to be feasible (Ruggiero et al., 2006).

In the next section, we will describe the design and core elements of the internet-based early psychological intervention “Trauma TIPS”, which we developed for the prevention of PTSD in injured trauma survivors. The intervention is targeted at decreasing acute psychological stress reactions in traumatic injury patients within the first month following their injury. In addition, we will present the results of an initial feasibility study.

4.1.1
Design of the Trauma TIPS early intervention

The script for Trauma TIPS was written by the authors from the Center for Anxiety Disorders, Research group Psychotrauma of the Academic Medical Center in Amsterdam, the Netherlands. The intervention was produced by the University of Amsterdam’s Audiovisual Center. The Trauma TIPS internet-intervention is an internet program of about 30 minutes duration with interactive elements and visual and auditory materials. Since patients use the web program within the first month after experiencing a traumatic event, which may be one of the most hectic and stressful periods in their lives, we considered keeping the design and lay-out of the web pages as simple and straightforward as possible. To achieve this, the toolbar of the program remained visible at the top of every page of the website. In addition, at the left and right hand bottoms of every web page, the buttons “back” and “next” respectively were present at all times, allowing patients to leave and enter sections at any time they wish. Trauma TIPS was accessed on a secure https://-website. Each patient was assigned a personal login name to log into the program. If a patient had forgotten his or her login name, he or she could click on a “forgot your login name?” button upon which the mail server automatically replied the login name to their preregistered email address. With Active Server Pages (ASP) HTML codes
were generated at the server, selecting the web pages using the data generated by each patient. In a Microsoft Access database relevant information was filed, such as the responses to the online anxiety instrument we added to our program (see description of the program below), and the total amount of time patients spent interacting with the various elements of the program. The video and audio fragments in the intervention were put on a streaming media server to allow for immediate viewing after clicking on them, without prior downloading.

The Trauma TIPS intervention consisted of the following steps, corresponding to the buttons in the navigation bar at the top of each page (see Figure 4.1):

1. Introduction: explanation of the goal of the intervention and operating instructions;
2. Questions 1: a pre-test of state anxiety;
3. Trauma: this module consists of three sections:
   a. Trauma Unit: a video feature in which a brief overview of the procedures at the Trauma Unit was presented. In addition, the head of the Trauma Unit explained that stress reactions are very common after traumatic injury, but that the intensity may vary across individuals.
   b. Experiences: three video features of Trauma Unit patients (re-enacted by actors) who briefly disclosed their experiences after the accident. Based on the distribution of sex, age and trauma mechanism in our hospital’s trauma records, we presented three patients: a male survivor of an industrial accident (“Piet”; 51 years); a male survivor of a motor vehicle accident (“Mike”; 31 years); and a female survivor of an assault (“Esther”; 35 years).
   c. Tips: a summary list of five tips for coping with common physical and psychological reactions after a traumatic event was presented. The tips corresponded to the suggestions of the actors during the three video features of the Trauma Unit patients;
4. Exercises: two audio features of approximately 7 minutes duration each with instructions for stress management techniques were presented. The stress management techniques were relaxation exercises based on breathing retraining and muscle relaxation, developed by external experts and staff members of the Amsterdam Academic Medical Center;
5. Questions 2: a post-test of state anxiety;
End of the program: information about other sources of available help was provided. Participants were given the opportunity to contact the main investigator of the project for additional support or information on professional help. Patients could also leave their remarks and suggestions about the program at a separate remarks section. The remarks were only visible for the project researchers.
4.1.2 Cognitive behavioral elements of the intervention

The main cognitive behavioral elements of the intervention were: information/psychoeducation, modeling, in vivo exposure, social support, and stress management. Below, we will briefly outline the distinctive cognitive behavioral elements and we will discuss evidence to support their use in acutely injured trauma survivors.

Information and psychoeducation. First, information about the usual natural decline in symptoms of distress after experiencing a traumatic event was given in the video feature of the trauma unit professional (step 3a) and in the three video features of the patients (step 3b), who described their initial psychological reactions to the trauma, such as feeling tensed, difficulties concentrating or sleeping, and feeling tired. All patients emphasized that they were moderately distressed at first, but that they improved as time went by. In addition, suggestions for coping strategies were provided in the patients’ videos, such as seeking social support for emotional or practical reasons, seeking distraction, resuming normal daily activities (i.e. work, social events), and to self-expose to normal daily routines that may be feared or avoided, such as driving a car. Furthermore, the following 5 tips (step 3c) were provided: 1. Symptoms of distress, such as thinking back about what happened, not feeling up to much, insomnia are common, but often spontaneously decline; 2. Seek support with other people, for emotional or practical help; 3. Seek distraction in activities; 4. Resume daily activities at one’s own pace; 5. When many symptoms of distress are present, when a participant is worried or when symptoms do not decrease, participants were advised to contact a staff member of the Trauma TIPS team, or a staff member of the Trauma unit. Contact details were provided on the final page.

Note, however, that recent studies evaluating the use of psychoeducation in the immediate aftermath of severe injury, showed that psychoeducation does not contribute to reductions in symptoms of PTSD and may even worsen existing psychological symptoms (Ehlers et al., 2003; Scholes, Turpin, & Mason, 2007; Turpin, Downs, & Mason, 2005). One study in emergency room patients with panic attacks found that psychoeducation coupled with exposure instructions was more effective than psychoeducation alone in decreasing panic symptoms (Swinson, Soulios, Cox, & Kuch, 1992). In a recent systematic review on the efficacy of psychoeducation in the prevention of PTSD, Wessely et al. (2008) suggested that the type of psychoeducation provided so far may not have been optimal. Instead of sensitizing victims by summing up all possible stress reactions, the authors stated that psychoeducation should include constructive information to stimulate the expectancy of resilience, and promote help seeking, if necessary (Wessely et al., 2008). In our Trauma TIPS intervention, we adhered to these recommendations by not mentioning all possible stress symptoms patients may or may not develop, and by emphasizing return to normal routine.
Modeling, i.e. visually showing behavior with the intent to transfer knowledge on wanted behavior patterns, may facilitate behavior change (Bandura, 1969). It has been used previously in an early video-based intervention for rape victims (Resnick, Acierno, Holmes, Kilpatrick, & Jager, 1999). In Trauma TIPS, modeling was incorporated by showing three patients, enacted by actors, who briefly told their experiences after the accident. Even though the patients told their own story of how they have coped with the aftermath of trauma, the videos had several commonalities. Each patient conveyed information on how to cope with commonly occurring physical and psychological difficulties after traumatic injury. The videos also showed the patients successfully engaging in activities to reduce avoidance behaviors. For instance, one of the videos presented a trauma victim driving a car again after he initially had fear of driving by himself.

In vivo exposure elements in the Trauma TIPS intervention were embedded within the three video clips of the patients. In these clips, the patients explained how they gradually encountered activities and situations that provoked anxiety. The purpose of the in vivo exposure tips was to stimulate patients to pick up their normal routine and to prevent avoidance behavior. As already mentioned earlier, of all the elements of the Trauma TIPS intervention, exposure was the element with the strongest empirical evidence.

Social support is strongly related to a more favorable PTSD symptom course (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Recent commentaries indeed suggested that, as part of early intervention, trauma victims should be stimulated to use their own social network (see Gray & Litz, 2005). In the Trauma TIPS intervention, social support was presented in the video clips of the patients as a successful coping strategy. We recommended patients to actively seek support with other people in the form of coping tips (see Information and psychoeducation).

Stress management was presented in the form of two audio clips of approximately 7 minutes duration, each with instructions for stress management techniques. The first clip (“Muscle relaxation”) focused on progressive muscle relaxation through breathing retraining. The second clip (“Safe place”) was an exercise that focuses on decreasing stress or tension levels by imagining a safe and secure place while retraining breathing. The main purpose for the exercises was to decrease acute distress levels and help patients regain a sense of control. Relaxation therapy was not regarded as an effective stand-alone treatment for PTSD, but was usually provided as an effective anxiety-reducing tool within a larger framework of CBT treatments for early symptoms of PTSD and acute stress disorder as well as chronic PTSD (Foa, Keane, Friedman, & Cohen, 2008).
4.1.3
Pilot study for feasibility and acceptability of the intervention

To evaluate the feasibility of the intervention and its effects on acute anxiety and early PTSD symptoms, we performed an initial pilot study of the intervention. We hypothesized that the intervention was acceptable to the patients and feasible for implementation in the intended population. Second, we hypothesized that the specific parts of the intervention would not cause or aggravate adverse short-term psychological reactions (i.e. anxiety, posttraumatic stress symptoms).

4.2 MATERIALS AND METHODS

4.2.1
Participants

In December, 2006 and January, 2007, five eligible consecutively admitted trauma patients (4 males, 1 female; age in years: \( M = 34.4, \) SD = 19.5, Mdn = 23.0, range = 40; 2 patients had up to four years of highschool, 3 had five or more years of highschool) of the Level I Trauma Center of the Academic Medical Center in the Netherlands were included in the study. Four patients were admitted following a motor vehicle accident and one after a work-related accident. None of the patients endured severe physical injuries (Injury Severity Score: \( M = 4.6, \) SD = 4.3, Mdn = 6.0, range = 9) and all were released from hospital care immediately (\( n = 1 \)) or after a few days (\( n = 4 \)) (number of days in hospital care: \( M = 3.0; \) SD = 2.9; Mdn = 2.0, range = 7). Five healthy control subjects were included, who matched the patients in terms of gender (4 males, 1 female), educational level (2 up to four years highschool, 3 five or more years highschool), and age (\( M = 34.6, \) SD = 19.8, Mdn = 23.0, range = 41). Patients under the age of 18 years, with suicidal ideation, with psychotic, bipolar, or organic disorders, or depressive disorder with psychotic characteristics, with a Glasgow Coma Score < 13 at the time of the intervention, without access to the internet, or who were physically unable to perform the intervention, were deemed ineligible for the study.

4.2.2
Measures

State anxiety

The State Trait Anxiety Inventory (STAI; Spielberger, 1983; Van der Ploeg, Defares, & Spielberger, 1980) was used to assess state anxiety online at pre- and post-intervention. The STAI is a well-established questionnaire containing 20 items on a 4-point Likert scale (1=very much to 4=not at all).
Posttraumatic stress symptoms

Patients completed the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997), a well-established questionnaire for assessing posttraumatic stress symptoms, at baseline assessment and at 1 month post-trauma. The IES-R consists of 22 items distributed over 3 subscales that represent the 3 symptom clusters of PTSD: Intrusion (8 items), Avoidance (8 items), and Hyperarousal (6 items). The sum of all items represents a total score of PTSD symptoms. Scores on the items range from 0 (not at all) to 4 (very much). Because we were especially interested in the acute psychological reactions after trauma and post-intervention, patients completed an additional assessment of intrusive and hyperarousal symptoms at 24 hours post-intervention.

4.2.3
Feasibility and satisfaction

The feasibility and acceptability of the intervention was measured by assessing the participants’ opinions on clarity and usefulness of all the individual parts of the intervention. Scores were rated on 4-point Likert scales ranging from 1 (not clear at all, not useful at all) to 4 (clear, useful). Participants could also indicate suggestions or improvements for the intervention. Furthermore, patient satisfaction was assessed on a 4-point Likert scale with scores ranging from 1 (very unsatisfied) to 4 (satisfied).

4.2.4
Procedure

After written and oral informed consent, patients completed a self-report assessment of PTSD symptoms. Next, personal log-in names for the internet-based intervention were provided to all participants. State anxiety was assessed online immediately prior to and following the program. Within 24 hours of completing the intervention the participants were contacted face-to-face or by telephone by clinicians for an evaluation of feasibility of the intervention. Patients completed post-assessments of current PTSD symptoms at 24 hours after the program and again at 1 month post-trauma.
4.2.5 Statistical analyses

Means and standard deviations of all questions on feasibility were computed. Means, medians and ranges of demographic characteristics and outcome variables are presented. To compare means between pre-intervention and post-intervention assessments of state anxiety and PTSD symptoms within patients and healthy control subjects, paired one sample t-tests were used. Level of significance was set at $p < .05$. Data were analyzed using SPSS (version 12.0.1).

4.3 RESULTS

4.3.1 State anxiety

Table 4.1 shows the individual and mean scores of the participants on the STAI at pre- and post-intervention. No significant differences were found between pre- and post-intervention assessments for both patients and controls. All mean scores were equal to norms of male and female student populations, male army draftees, or ex-radiotherapy patients (van der Ploeg et al., 1980).

4.3.2 Posttraumatic stress symptoms

Table 4.1 also shows the individual and mean scores of the patients on posttraumatic stress symptoms. Although all mean scores of the patients decreased with time, no significant differences were found between any of the mean scores on posttraumatic stress symptoms.

4.3.3 Feasibility

Overall, the patients and the controls evaluated the intervention as clear and useful, although some sections were preferred above others. Most comments were focussed on the sections containing the pre- and post-intervention assessments of state anxiety and the stress management exercises. Regarding the assessments of state anxiety, the participants commented that they contained too much overlap between the questions (3 patients and 3 controls) and too many questions (1 patient, 3 controls). Regarding the stress management and relaxation exercises, some participants (1 patient, 1 control) had difficulty concentrating on the exercises enough to perform them seriously. Others (2 patients, 2 controls) thought the exercises were very relaxing and would try them again. One control had difficulty
listening to the voice and concentrating on the exercise. About the video of the trauma professional, the participants’ comments were that the information was calming, soothing, clear and informative (4 patients, 5 controls), helpful for themselves (2 patients, 2 controls), or helpful for other patients (3 patients, 3 controls). The opinions of the participants about the videos of the patients were that they were interesting (2 controls), soothing (1 patient), diverse (1 control), and easy to relate to (2 controls). According to the participants, the video of the work-related accident provided helpful information about coping with the aftermath of injury both physically and psychologically (2 patients, 4 controls) and on how to regain their normal routine after an accident (1 patient and 2 controls). Three patients thought the information and the specific story of the video of the car accident was clear and insightful. The information in the video of the assault victim was easy to understand (2 patients, 2 controls), interesting (1 patient), and provided good tips for relaxation (2 controls). The tips summarized after the experiences of the patients were evaluated as calming and easy to understand and apply (3 patients, 5 controls). Two patients and 3 controls felt the tips were helpful and worth trying themselves, and 1 patient and 1 control already applied them in their own situation. At the end of the program, the participants rated the possibility of providing remarks and the contact information as useful and necessary (3 patients, 3 controls). Suggestions for improvement concerned resolving technical difficulties, such as automatically being logged out and having to log in again and re-answering all questions, and changing the questions of the pre- and post-intervention assessment.

4.4 DISCUSSION

In this article, we described the Trauma TIPS intervention. Based on well-established cognitive behavioral techniques, we designed an internet program for injured trauma victims with the aim of reducing acute hyperarousal and anxiety symptoms to prevent the development of PTSD on the long term. In order to evaluate its feasibility for further study and implementation and to ensure that the elements of the intervention did not cause or aggravate adverse psychological reactions, we conducted an initial pilot study. The results show that the internet-based intervention was feasible and acceptable and had no immediate adverse psychological reactions for the patients or the control subjects. The individual sections or steps in the program were generally evaluated as clear and useful. The participants showed satisfaction with the end product. The results also suggest some adjustments to the intervention that were implemented after the completion of the pilot study. For instance, most participants felt that the 20-item STAI, which we used to assess distress, was too long to complete twice immediately before and after the intervention. Therefore, we replaced the STAI as an online outcome measure with a more time-efficient instrument for assessing state anxiety, a single item Visual Analogue Scale (VAS), to place less demand on participants. With regard to the relaxation exercises, we chose
another voice-over that was more neutral to listeners, as some of the participants criticized the original voice. Lastly, all technical difficulties were addressed and eliminated to minimize any inconvenience for future participants.

Since the current study was carried out as a pilot feasibility study, there are a few important limitations. First, we included a small number of participants. Thus, at present no conclusions with respect to efficacy of the Trauma TIPS intervention may be drawn yet. In addition, we assessed symptoms of PTSD only up to one month after the trauma. Further assessments on later time points should be made to examine the long-term psychological effects of the intervention. Finally, the five trauma-exposed patients in this pilot exhibited low levels of anxiety and PTSD severity. The safety and efficacy of the Trauma TIPS in patients with higher levels of distress and arousal remains to be tested.

Currently, Trauma TIPS is under evaluation in a randomized controlled trial in 300 injured patients admitted to the Trauma Units of the Academic Medical Center and the Free University Medical Center in Amsterdam. In this trial, we compare effectiveness of Trauma TIPS to usual care prevents with respect to the prevention of (symptoms of) PTSD, anxiety and depression, and the reduction of health care costs. If the intervention indeed proves to be effective in preventing PTSD, it may be added to the standard care for trauma patients in Level I Trauma Centers and at emergency departments in peripheral hospitals. The e-mental health approach holds promise for the acute psychological care for trauma victims due to its low-threshold nature, easy application, possibilities for wide distribution, and low burden on financial and personnel costs.
Table 4.1. Individual and mean scores on state anxiety (STAI) at pre- and post-intervention of controls and patients, and on posttraumatic stress symptoms (IES-R) at baseline, 24 hrs post-intervention and 1 month post-trauma of patients.

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State anxiety (STAI)</td>
<td>Pre-intervention</td>
<td>29</td>
<td>37</td>
<td>59</td>
<td>26</td>
<td>27</td>
<td>35.6 (13.8)</td>
</tr>
<tr>
<td></td>
<td>Post-intervention</td>
<td>30</td>
<td>36</td>
<td>61</td>
<td>24</td>
<td>27</td>
<td>37.4 (9.2)</td>
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<tr>
<td>PTSD symptoms (IES-R)</td>
<td>Baseline Intrusion</td>
<td>2</td>
<td>X</td>
<td>9</td>
<td>2</td>
<td>11</td>
<td>6.0 (4.7)</td>
</tr>
<tr>
<td></td>
<td>Avoidance</td>
<td>0</td>
<td>X</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>.5 (.6)</td>
</tr>
<tr>
<td></td>
<td>Hyperarousal</td>
<td>2</td>
<td>X</td>
<td>4</td>
<td>1</td>
<td>6</td>
<td>3.3 (2.2)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4</td>
<td>X</td>
<td>14</td>
<td>3</td>
<td>18</td>
<td>9.8 (7.4)</td>
</tr>
<tr>
<td></td>
<td>24 hrs Intrusion</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>6.0 (4.7)</td>
</tr>
<tr>
<td></td>
<td>Hyperarousal</td>
<td>1</td>
<td>5</td>
<td>11</td>
<td>0</td>
<td>1</td>
<td>1.8 (1.0)</td>
</tr>
<tr>
<td></td>
<td>1 month Intrusion</td>
<td>X</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.3 (.5)</td>
</tr>
<tr>
<td></td>
<td>Avoidance</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.0 (.0)</td>
</tr>
<tr>
<td></td>
<td>Hyperarousal</td>
<td>X</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>2.0 (4.0)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>X</td>
<td>1</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>2.3 (3.9)</td>
</tr>
</tbody>
</table>

STAI = State Trait Anxiety Inventory (Spielberger, 1983); IES-R = Impact of Event Scale-Revised (Weiss & Marmar, 1997) Note. Paired sample t-tests results: baseline-1 month: total IES-R: mean difference = 9.0, 95% CI: -10.7 to 28.7, \( p = .19 \); intrusion: mean difference = 7.3, 95% CI: -4.4 to 19.1, \( p = .12 \); hyperarousal: mean difference = 1.0, 95% CI: -11.4 to
## Controls

<table>
<thead>
<tr>
<th>Mdn (range)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>M (SD)</th>
<th>Mdn (range)</th>
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<tbody>
<tr>
<td>29.0 [33]</td>
<td>52</td>
<td>29</td>
<td>30</td>
<td>37</td>
<td>39</td>
<td>37.4 (9.2)</td>
<td>37.0 [23]</td>
</tr>
<tr>
<td>37.0 [23]</td>
<td>39</td>
<td>31</td>
<td>31</td>
<td>35</td>
<td>48</td>
<td>35.6 (14.9)</td>
<td>30.0 [37]</td>
</tr>
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### State anxiety (STAI)

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>M (SD)</td>
<td>Mdn (range)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>35.6 (13.8)</td>
<td>29.0 [33]</td>
<td>35.6 (14.9)</td>
</tr>
</tbody>
</table>

### PTSD symptoms (IES-R)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>24 hrs post-intervention</th>
<th>1 month post-trauma</th>
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</thead>
<tbody>
<tr>
<td>Intrusion</td>
<td>6.0 (4.7)</td>
<td>6.0 (4.7)</td>
<td>&lt;0.3 (0.5)</td>
</tr>
<tr>
<td>Avoidance</td>
<td>0.5 (0.6)</td>
<td>0.5 (0.6)</td>
<td>0.0 (0.0)</td>
</tr>
<tr>
<td>Hyperarousal</td>
<td>3.3 (2.2)</td>
<td>1.8 (1.0)</td>
<td>2.0 (4.0)</td>
</tr>
<tr>
<td>Total</td>
<td>9.8 (7.4)</td>
<td>&lt;1.0 (3.0)</td>
<td>&lt;0.5 (8.0)</td>
</tr>
</tbody>
</table>

13.4, *p* = .76; avoidance: mean difference = .7, 95% CI: -.8 to 2.1, *p* = .18; baseline-24 hrs post-intervention: intrusion: mean difference = 0.0; hyperarousal: mean difference = 1.5, 95% CI: -1.3 to 4.3, *p* = .12; 24 hrs post-intervention-1 month: intrusion: mean difference = 7.3, 95% CI: -4.4 to 19.1; hyperarousal: mean difference = -1.0, 95% CI: -14.1 to 12.1, *p* = .78.