The Benefit of Conserving and Gaining Resources after Trauma: A Systematic Review

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Abstract: Background: Traumatic events involve loss of resources, which has consistently been found to be associated with developing stress-related illness such as posttraumatic stress disorder (PTSD). Objective: The purpose of this systematic literature review was to determine if there is evidence for the salutatory effect of resource gain on PTSD, and if there are intervention models that utilize and assess gain in PTSD. Data Sources: All relevant online databases were systematically searched using key terms and a method, detailed in Figure 1. Results: Of 22 relevant articles, there were three intervention studies, one longitudinal naturalistic study, eleven non-intervention association studies focusing on PTSD, and eight non-intervention association studies not focusing on PTSD. The intervention and naturalistic studies showed a significant positive effect on PTSD by specifically targeting the gain of resources during an intervention. Other non-intervention research supports the notion that resource loss is pathogenic and resource gain is beneficial after traumatic exposure. Conclusions: Interventions that develop and assess effects of gain of various types of resources on stress-related illness should be encouraged. Interventions that already have proven efficacy for PTSD might include standardized assessment of resource loss and gain to further understand mechanisms of action.

Keywords: trauma; PTSD; resources; interventions

1. Introduction

Traumatic events, such as combat, rape, physical assault, natural disasters, and life-threatening illness, often involve the rapid loss of resources [1]. For example, natural disasters often result in loss of shelter, food, and safety, while interpersonal violence may involve loss of the sense of personal security and self-confidence. Lost resources and ongoing stressors strongly predict the risk for developing a stress-related illness following trauma: this has been demonstrated in survivors of war, natural disasters, terrorist attacks, intimate partner violence, and sexual assault [2–9]. For this reason, evaluation of current stressors and loss of resources is recommended during the diagnostic and treatment evaluation for post-traumatic stress disorder (PTSD) [10].

Because of the now clear and consistent evidence that resource loss and ongoing stressors are associated with the development and maintenance of PTSD, it would seem prudent to target and monitor lost resources and objective stressors during treatment. The Conservation of Resources (COR)
theory and instruments provide a framework and the tools for this purpose [11,12]. Central to COR theory is the concept that people strive to obtain, retain, and protect the things, or resources, they value. Resources fall into four categories: objects, conditions, personal characteristics, and energies (Hobfoll, 1989) [11]. These resources are highly interrelated, however, and the idea that resource loss contributes to further resource loss is a key aspect of COR theory. Additionally, individuals with less access to resources are more prone to further resource loss under stressful conditions. On the other hand, having more resources can buffer against future resource loss and also facilitate future resource gain (Hobfoll, 1998) [11]. These patterns have been supported through studies showing that material resource loss predicts personal characteristic resource loss in the form of psychological distress [13,14], whereas resource gain is only critical in predicting distress in the context of loss [15].

Recovery and deterioration following a traumatic event illustrate the key COR ideas of “loss spirals” and “gain spirals” [12] so critical in PTSD. In particular, the loss of resources in the aftermath of trauma, when individuals are particularly vulnerable, contributes to the exacerbation of PTSD symptoms in a bidirectional relationship that continues over time [16]. In the aftermath of a natural disaster, for example, individuals’ loss of a home may lead to the subsequent losses of privacy, safety, and social support that come with living in a shelter. Additionally, finances are drained following the natural disaster. Ultimately, optimism decreases. In this example, an initial resource loss (home) contributes to further resource loss (privacy), which continues to affect other resources (optimism).

In spite of research indicating the relationship between resource loss and stress-related illness and the potential benefit of assessing and monitoring resource gain, interventions for stress disorders including PTSD may rely more heavily on appraisal and biological theories with trauma-focused psychotherapies and pharmacotherapy aimed at altering trauma appraisal and biology. The purpose of this review was to determine if there is evidence for the salutatory effect of resource gain during treatment for PTSD. The aim was to specifically determine if there are models of treatment that include the assessment of the possibility that gains consistent with the COR model provide a positive effect on psychopathology (symptoms) and/or functioning (less impairment). This is not a comprehensive review of the benefits of other types of specific gains, not assessed by the COR model, such as the known positive effects of social support of PTSD [17].

2. Methods

Figure 1 shows relevant key terms chosen, databases searched and the application of key terms to databases. Key terms relevant to topic were first identified. PILOTS and PsycARTICLES were the two databases chosen for the initial search. Key terms were then applied to the databases using two methods: (1) a search with ALL TEXT; and (2) a search within TITLE TEXT. Eleven searches were done in the PILOTS database using combination operators in ALL TEXT. Two searches were completed in the PILOTS database using a search in TITLE TEXT. Three searches were completed in PsycARTICLES using a search in TITLE TEXT. A total of 618 articles were yielded from the search.

One of the authors (A.G.) reviewed all abstracts to identify dissertations and theses, duplicate articles and articles that lacked appropriate content for exclusion. If “gain” was only measured as improvement in symptoms then the article was excluded, since our aim was to identify how resource gain in the COR model might improve symptoms and/or impaired functioning. Abstracts and full PDF articles for all articles were obtained and further review of text was conducted if the abstract was not informative enough to make a decision about inclusion or exclusion. One was in a foreign language and was excluded due to a lack of an English translation. Three authors (A.G., L.N., and J.S.) then reviewed the articles using a form developed specifically for this task to identify thematic categories and article content.
3. Results

Figures 2 and 3 show search results. Of the 618 articles first returned by the search method, 72 were dissertation and theses and 25 were duplicate articles and were thus excluded, one article was excluded for lack of English translation and 489 articles were excluded because of the lack of appropriate content. Six additional articles were found during review of the returned articles and were found to be relevant and were included. Thus, 37 articles comprised the final review. Two authors reviewed all articles and identified four thematic categories: (1) treatment or longitudinal naturalistic...
studies of which there were three; (2) non-intervention association studies focusing on PTSD, which included 11 articles; (3) non-intervention association studies not focusing on PTSD, eight articles; and (4) articles not applicable to the review, of which there were 15 which were then excluded from further review. Since only three studies provided information about intervention or longitudinal naturalistic models that assessed the effects of resource gain on PTSD, we have also included in the text and tables non-intervention studies that assess the effects of resource gain on symptoms after trauma to broaden the collective information on the subject.

Figure 2. Results of Search.

Figure 3. Themes and number of studies included in final review.
3.1. Treatment Studies

Johnson and Zlotnick found that resource gain during and after PTSD treatment was associated with a decrease of PTSD symptoms [18]. Participants included eighteen battered women with PTSD or subthreshold PTSD. Seven also met criteria for major depression, seven for lifetime substance use disorder, and thirteen for other anxiety disorders. The intervention consisted of a cognitive-behavioral therapy named Helping to Overcome PTSD with Empowerment (HOPE). HOPE is a 9–12 session, individual, manualized treatment that addresses the needs of battered women and emphasizes three stages of recovery: (1) establish safety, self-care, and protection; (2) remembrance and mourning; and (3) reconnection. Beginning sessions focus on psychoeducation on interpersonal violence, safety planning and PTSD. Next sessions focus on teaching women information and skills to make informed choices and establishing independence. Later sessions assimilate cognitive behavioral skills to cope with PTSD and PTSD features and address co-occurring problems commonly found among battered women. Participants attended an average of 7.1 sessions of HOPE and reported high satisfaction with the intervention. The therapy was associated with significant improvement in PTSD assessed with the Clinician Administered PTSD Scale (CAPS) (baseline \( M = 60.2, SD = 27.2 \); 6 month post-treatment \( M = 24.0, SD = 23.1 \)), depression assessed with the Beck Depression Inventory (BDI) (baseline \( M = 19.4, SD = 9.6 \); 6 month post-treatment \( M = 11.3, SD = 11.0 \)), and resource loss assessed with the Conservation of Resources-Evaluation (COR-E) (baseline \( M = 64.7, SD = 20.7 \); 6 month post-treatment \( M = 33.2, SD = 33.0 \)). Subjects also reported more effective use of their resources, and improved overall adjustment. The authors did not conduct an interactive analysis of resource loss by symptoms, nor did they describe the type of resource loss that was mitigated by treatment or what resources were gained.

A longitudinal naturalistic study by Walter and Hobfoll found that halting psychosocial and material resource loss through an intervention for sexual behaviors was associated with the abatement of PTSD symptoms [19]. Participants included 102 inner-city women with PTSD from interpersonal trauma. The women were randomly assigned to one of two interventions (HIV/AIDS prevention groups or general health skills and knowledge promotion group) or a usual care control condition (individual sessions that focused on safer sexual and general health behaviors). Resource loss variables (i.e., energy, family interpersonal, non-familial interpersonal, and material resources) were assessed at baseline and 6-month follow-up using the COR-E. At the conclusion of treatment, participants who improved below the diagnostic threshold for PTSD (non-diagnostic; \( n = 59 \)) were compared to participants with PTSD (diagnostic; \( n = 43 \)) (PTSD scores were not provided). At pretest, the groups were not significantly different on resource loss. At the six-month time point, participants with non-diagnostic symptoms reported significantly less resource loss than those with diagnostic PTSD in three of four domains: material, non-diagnostic 4.95, diagnostic 7.27 (\( p < 0.05 \)); energy, non-diagnostic 7.53, diagnostic 9.84 (\( p < 0.05 \)); family interpersonal, non-diagnostic, 2.44, diagnostic, 4.8 (\( p < 0.001 \)). These findings suggest that trauma recovery is promoted by the continued relationship of family, personal energy resources, and material resources after experiencing a traumatic event.

Thrasher, Power, Morant, Marks and Dalgleish found that a specific type of resource gain, increased social support, on the Significant Others Scale (SOS) significantly predicted symptom improvement on the Clinician Administered Posttraumatic Stress Disorder Scale (CAPS) [17]. Seventy-seven participants aged 16 to 65 years with chronic PTSD completed treatment in a randomized controlled trial (RCT) of exposure therapy (ET) and/or cognitive restructuring (CR), compared with relaxation for adults. The SOS consisted of twelve items about social support in dealing with the effects of trauma. CAPS change score in ET/CR was \( M = 34.8, SD = 22.8 \) compared to \( M = 13.2, SD = 23.1 \) in relaxation. Higher SOS scores were significantly associated with greater improvement in CAPS, \( r = 0.36, df = 75, p < 0.001 \). This study was the first to report social support concerning trauma predicting improvement with psychological treatment of PTSD.
3.2. Association Studies PTSD Focus

We identified 11 relevant studies that examined the relationship between resource gain and posttraumatic stress symptoms following a traumatic event. Resources were assessed with various instruments. A summary of the findings from these 11 studies is shown in Table 1. The most salient findings about the effects of resource gain on PTSD symptoms were in three studies: Wu, Hung and Chen (2002) [20], Slobodin, Caspi, Klein, Berger and Hobfoll (2011) [21] and Hall, Bonanno, Bolton and Bass (2014) [22]. The other eight studies revealed that experienced resource loss following trauma is associated with negative outcomes such as psychological distress and stress, PTSD symptoms, posttraumatic stress and depressive symptoms.

Wu et al. (2002) found that there were fewer PTSD symptoms in two groups of people, those that experienced “better” resources and those that experienced “no change” of resources after the Chi-Chi Earthquake [20]. These two groups were also equipped with better coping resources than the groups that experienced “worse” resources after the earthquake. Slobodin and colleagues found that Bedouin servicemen who experienced resource gain were more able than those who did not gain resources to effectively use defensive and avoidant strategies [21]. Authors opined that by gaining this ability, servicemen may be able to engage in less aversive thoughts and memories of their experienced trauma, further empowering them to gain more object resources following the traumatic experience. Loss of personal resources mediated the impact of trauma exposure on symptoms. Hall et al. (2014) found that male and female torture survivors experienced decreased depression and PTSD symptoms in relation to gaining social contact and social integration [22]. The authors argued that there is an “intuitive” inverse relationship between social resources and psychological distress. As distressing symptoms decrease, social resources improve. Equally, as gains in social resources occur, symptoms of distress would lessen.

3.3. Association Studies No PTSD Focus

Six studies found an association between experiencing resource gain and improvement of non-PTSD clinical symptoms after experiencing trauma: a summary of the results of these studies is shown in Table 2. Examples of experienced resource gain include social support, active coping, optimistic feelings of self and others, feeling life has meaningful purpose, psychosocial resources, materials, mastery, religious comfort and sense of cohesion. Positive impacts on clinical symptoms included decreased anger, depression, anxiety, and psychological dysfunction. Other positive associations from resource gain include positive adjustment after trauma and buffering of negative effects of resource loss on emotional health.

One study showed that resource gain had no effect on clinical symptoms and another study examined resource loss but not gain. Zwiebach and colleagues reported that resource gain had no effect in their study of patterns of loss, gain and subsequent mental health in 402 Hurricane Katrina survivors. In a hierarchical regression model, gains made in social support, future orientation, goal orientation, physical health, and health insurance were not associated with changes in psychological distress [23].
Table 1. Association Studies with a PTSD Focus, Summary Table.

| Authors and Year | Research Question | Sample size, Population, and Trauma Experience | Resources Measured | Other Measured Clinical Symptoms | Experienced Resource Gain | Positive Associations with Resource Gain | Associations with Resource Loss |
|------------------|-------------------|-----------------------------------------------|-------------------|---------------------------------|--------------------------|----------------------------------------|-------------------------------|
| Wu, Hung, Chen, 2002 [20] | Is there a positive relationship between changes of health conditions/social relationships and the state of possessed resources? | 556 adults Taiwan Chi-Chi Earthquake | Objective and Subjective Threat 1, Subjective Evaluation of changes in life domains and coping resources 2, Coping Resources 3 | Severity of Posttraumatic Symptoms 4 | Socio-economic Domain, Social-interpersonal Domain, Personal health Domain, Overall Condition | Groups that experience “better” or “no change” in resources displayed fewer PTSD symptoms. | “Worse” group reported more posttraumatic symptoms. |
| Slobodin, Caspi, Klein, Berger and Hobfoll, 2011 [21] | Does loss of resources mediate the relationship between trauma and posttraumatic responses? | 317 Bedouin servicemen Israeli Defense Forces | COR-E 5, Traumatic Events 6 | Depression 7, Anxiety 7 | Trauma-related gains in object resources, Trauma-related gains in material resources | Gains reflected the ability to use defensive and avoidant strategies effectively. | Loss of personal resources negatively mediates the impact of trauma on development of psychological symptoms. |
| Hall, Bonanno, Bolton and Bass, 2014 [22] | Does baseline psychological distress symptoms and changes in these symptoms were associated with changes in social resources? | 96 male and female adults Torture survivors | Social Support 30, Social Integration 66, Frequency of Social Contact 67, Demographic Variables 8 | Depression 7, Anxiety 7, Traumatic Grief | Social Support, Social Integration, Frequency of Social Contact | Decreased depression, anxiety and PTSD symptoms was significantly associated to gaining social integration. Decreased depression and PTSD was associated to gaining social contact. | Depression symptoms, PTSD symptoms and traumatic grief were associated with losses to social integration. |
| Hobfoll, Canetti-Nism and Johnson, 2006 [24] | What is the impact of terrorism on PTSD symptoms and depressive symptoms? | 905 Jewish and Palestinian citizens of Israel Al Aqsa Intifada acts of terrorism | Demographic Variables 8, Terrorism Exposure 9, Economic Resources 10, Psychological Resources 11, Support Satisfaction 12, Protective Attitudes 13 | Depressive Symptoms 14, PTSD 15 | Psychological Resource Gain | Psychosocial resource loss is strongly related to PTSD symptoms and depressive symptoms. | |
| Heath, Hall, Russ, Canetti and Hobfoll, 2012 [25] | What are the transitional relationships among resource loss and psychological distress? | 752 Palestinian adults Political Violence | Intrapersonal and Interpersonal Resources 5 | PTSD 17, Depressive Symptoms 18 | | Psychological resource loss and psychological distress predicted each other over time. | |
| Blaze and Shwalb, 2009 [26] | What are the long term psychological impacts of Hurricane Katrina? | 636 high school aged students Hurricane Katrina | Resource Loss 19, Self-Esteem 20, Optimism 21 | General Psychological Distress (GPD) 22, Posttraumatic Stress (PTS) 23 | | Self-esteem scores predicted posttraumatic stress. Lower self-esteem, lower optimism, and greater relocation strongly predicted GPD. | |
Table 1. Cont.

| Authors and Year                  | Research Question                                      | Sample size, Population, and Trauma Experience | Resources Measured                  | Other Measured Clinical Symptoms | Experienced Resource Gain | Positive Associations with Resource Gain | Associations with Resource Loss |
|-----------------------------------|--------------------------------------------------------|------------------------------------------------|-------------------------------------|----------------------------------|---------------------------|------------------------------------------|----------------------------------|
| Littleton, Grills-Taquechel and Assem, 2009 [27] | What are the risk factors for posttraumatic symptomatology? | 293 female university students Mass shooting at Virginia Tech | Social Support 24 Resource Loss 5 | PTSD 25 Depression 26 Anxiety 27 |                           |                                          | Resource loss in the time after shootings predicted experienced trauma. |
| Hobfoll, Tracey and Galea, 2006 [28] | Does resource loss predict PTSD and depression?        | 2752 random individuals in New York City 11 September 2001 World Trade Center | Sociodemographic characteristics 8 9/11 experiences 28 Lifetime Trauma Event Exposures 29 Social Support 30 Resource Loss and Resource Gain 5 | Panic Attack Symptoms 31 PTSD 32 Depression 33 |                           |                                          | Critical role of resource loss in predicting PTSD and depression following terrorism. |
| Dekel and Hobfoll, 2007 [29]      | Examine emotional adjustment of Holocaust survivors when facing new stressors (Intifada). | 102 Holocaust survivors of Israel Terror and threat of missile attack | Loss of Personal Resources 11 Loss of Interpersonal Resources 11 | PTSD 16 Psychiatric Symptoms 34 |                           |                                          | During Holocaust those who lost a spouse or child had higher PTSD symptoms During Intifada higher loss of interpersonal psychological and person resources was strongly associated with higher PTSD. |
| Cordova, Walser, Neff and Ruzek, 2005 [30] | To identify factors that influence emotional adjustment after injury to prevent future psychological impairment. | 47 emergency room admitted patients Traumatic Experience | COR-E 5 Social Constraints 35 Stressfulness of Event 36 Acceptance and Action 37 Demographics 8 | PTSD 38 Depression 26 |                           |                                          | Greater social constraints were associated with greater PTSD symptoms. |
| Littleton, Kumpula and Orcutt, 2011 [31] | Do psychosocial resources predict PTSD symptoms?        | 691 college women Mass shooting at Northern Illinois University | Life Trauma History 39 Exposure to Shooting 41 Resource Loss 5 | PTSD 42 Psychological Distress 40 |                           |                                          | Resource loss experienced in the aftermath of the campus shooting predicted PTSD symptoms. |

1–67: See Appendix A.
| Authors and Year | Study | Sample Population and Trauma Experienced | Resources Measured | Other Measured Clinical Symptoms | Experienced Resource Gain | Associations of Resource Gain |
|-----------------|-------|------------------------------------------|-------------------|---------------------------------|--------------------------|-------------------------------|
| Littleton, Axsom and Grills-Taquechel, 2009 [32] | Longitudinally examine interpersonal and interpersonal resource loss and gain in relation to college students’ psychological distress. | 193 College Women; ages 18–27 Virginia Tech mass shooting | Resource Loss and Resource Gain 5 Social Support 24 Coping Strategies 43 Exposure to Shooting Incident 41 | Depression 26 Anxiety 27 | Social Support Active Coping | Decrease in depression and anxiety symptoms. |
| Wells, Hobfoll and Lavin, 1999 [33] | Pattern of resource loss and resource gain in pregnant women during pregnancy and following pregnancy. | 71 women Pregnancy | COR-E 5 | Depressive Mood 26 Anger 44 | Gains during and after pregnancy include increase in self pride, optimism, and better relationship with others | Decrease in anger and depressed mood. |
| Hobfoll, Johnson, Ennis and Jackson, 2003 [34] | Study how economic stress (material loss) alters women’s personal and social resources and how changes in the resources impact anger and depressive mood. | 714 women Inner City | Material Loss 5 Mastery 45 Social Support 12 | Depressive Mood 46 Anger 47 | Mastery Gain Material Gain Social Support | Mastery gain has less depressive mood. Decrease of material loss experienced lower depressed mood and anger. |
| Holahan, Moos, Holahan and Cronkite, 1999 [35] | Better understand the role of psychosocial resources in the stress and coping process. | 326 Individuals Community Sample | Sociodemographics 9 Family Support 36 Personality Characteristics 49 Life-Change Events 50 | Depressive Symptoms 51 | Psychosocial Resources | Decrease of depressive symptoms Decrease of excess negative life events. |
| Cook, Aten, Moore, Hook and Davis, 2013 [36] | Examine associations among resource loss, religiousness, posttraumatic growth, and physical and mental health. | 189 college students Hurricane Katrina | Resource Loss 11 General Religiousness 52, 53 Health and Adjustment 34 Posttraumatic Growth 45 | Religious Comfort | Positive adjustment Buffer negative effects of resource loss on emotional health. |
| Ying, Akutsu, Zhang and Huang, 1997 [37] | Test if sense of coherence serves as a mediator between stressors, resources, and psychological functioning. | 2234 Vietnamese, Cambodian, Laotian, Hmong, and Chinese-Vietnamese refugees | Resistance Deficit Variables 56 Sense of Coherence 57 Psychological Dysfunction 58 | Depression 48 Anxiety 50 | Sense of Cohesion | Lower rates of depression, anxiety and psychosocial dysfunction. |
| Zwieback and et al., 2010 [23] | Analyzed patterns of loss, and gain and subsequent mental health. | 402 survivors of Hurricane Katrina | Social Support 60 Participants Outlook 61, 62 Goal Orientation 61, 62 Health and Hurricane Exposure 63 | Psychological Distress 59 | Social Support Future Orientation Physical Health Insurance | Resource gain showed no effect. |
| Smith and Freedy, 2000 [9] | Examine the role of psychosocial resource loss after the Midwest Flood. The studied resources fully mediated flood effects. | 131 adults Midwest Flood | Flood Exposure 44 Psychosocial Resources 41 Psychological Distress 22 Physical Symptoms 53 | Resource gain was explained. | 43–65: See Appendix A. |
4. Discussion

The aim of this review was to determine whether there are models of treatment that include the assessment of the relationship between gains consistent with the COR model and have a positive effect on psychopathology and/or functioning. Because the literature on this specific topic was found to be sparse, we broadened the review to include non-intervention research that would add knowledge about the possible effect of resource gain on PTSD symptoms and/or functioning. There is only one published study found that showed a significant positive effect on PTSD by specifically targeting lost resources during intervention. A second study focusing on reducing psychosocial and material resource loss through an intervention for sexual behaviors demonstrated a reduction in PTSD associated with the reduction of loss, and a third demonstrated that increasing social support was associated with lessening PTSD symptoms. These studies, however, evaluated the interaction between intervention and reduction of lost resources rather than the presence of an actual gain of resources that helped ameliorate symptoms and functioning. Whether reduction of lost resources is similar or the same to gained resources in content and effects on treatment remains an open question. These three studies, nonetheless, build on and operationalize the literature synthesized in this review showing that loss of resources following traumatic stress is a significant predictor of PTSD and other clinical conditions, and reducing lost resources is salutary for PTSD and other clinical conditions. Other non-intervention research supports the idea that resource loss is pathogenic and resource gain, or at least reduction of loss, is salutary after traumatic exposure. A methodological point is that there were many assessment instruments used, which are referenced in the Appendix A. While recommending a standardized approach is not central to the current work, the field may benefit from such standardization to enhance comparative research.

Findings from this review indicates that evidence-based treatment for PTSD is aimed primarily at pathology reduction in the individual and does not commonly assess the role of objective stressors, resource loss, or resource gain as mechanisms of action. Interventions that have evidence of efficacy for PTSD include a group of therapies under the rubric of cognitive behavior therapy (CBT) such as prolonged exposure, cognitive processing therapy and stress inoculation, eye movement desensitization and reprocessing, and various pharmacological therapies as monotherapy or combined with CBT [10,38,39]. There is very little research about the mechanisms of action of these therapies [40]. This literature implies that the effect of the gain of resources has a significant part on altering symptoms and/or the biology within the individual. For example, exposure therapy appears to have large effects on anxiety and fear, but not much is known about its effects on avoidance, social isolation, interpersonal problems, or anger [41]. While altering anxiety and fear responses is critical to trauma recovery, the broader mechanisms related to positive resource gain of many types is poorly understood and warrants further study.

There are undoubtedly studies about interventions that promote resource gain that were not found in this literature review due to inherent limitation of electronic searching. For example, Trauma Management Therapy (TFT) for PTSD was developed for combat Veterans and showed that a combination of education, exposure, and social and emotional skills training decreased symptoms and increased participation in social and employment activities [42]. In another study primarily about the benefit of acupuncture for PTSD, the comparator intervention was a 12-week integrated CBT delivered in group [43]. Sessions 1 to 3 utilize psychoeducation, behavioral activation, and activity planning, collectively termed “Trajectory and Resource Loss Stabilization”. Participants identify valued resources that have either been lost or are at-risk, and then make plans to engage in activities that will help establish a resource gain cycle. During Sessions 4 to 12 where participants are taught classic cognitive restructuring [44], imagery rehearsal [45], and exposure and desensitization techniques [46,47], participants continue to establish a resource gain cycle. Simple effects analyses showed that symptoms on the Post-Traumatic Symptom Scale—Self-Report (PSS-SR) declined significantly from baseline to end-treatment, with 36% having PSS-SR scores below the entry criterion level of ≥16 at end-treatment.
Other interventions that have at least some evidence of efficacy, such as patient education, relaxation, imagery rehearsal therapy, brief psychodynamic therapy, hypnosis, and acupuncture, most likely help the patient with PTSD gain resources of some type(s), yet assessment of that gain is poorly understood while symptom reduction as a primary and worthy goal is measured. The VA/DOD guidelines describe many types of interventions of psychosocial rehabilitation and spiritual support under “Adjunctive Services”, many of which undoubtedly help PTSD sufferers re-gain valuable lost resources. Clinical guidelines soundly describe the need to assess symptoms and functioning at many points along the triage-diagnosis-intervention trajectory, yet recommending evaluation of resources that are at risk or lost and those resources that are gained with treatment is absent [10].

A group of scholars convened to develop essential elements of intervention for the immediate and mid-term period after mass trauma, focusing on identifying principles that have empirical support for promoting resistant and resilient outcomes. The five principles identified were to promote: (1) a sense of safety; (2) calming; (3) a sense of self- and collective-efficacy; (4) connectedness; and (5) hope [48]. These principles if applied favor targeting the gain of internal and external resources over primary symptom reduction. While there are no empirical data on the effectiveness of applying these principles in a clinical setting, they show promise as a general and standard method to mitigate loss and promote gain. It would also help the field if assessment and treatment guidelines would recommend assessing resources lost and gains made during treatment.

Traumatic events rapidly change the trajectory of one’s lived experience, and not only significantly alter cognitive and biological functioning, but also one’s identity and sense of belonging in a world that has to the survivor become different than before the events. Multiple types of available resources have been lost to the survivor with PTSD and other distressing symptoms. A synthetic view using COR theory and data about the relevance of resource loss associated with illness and gain associated with improvement would suggest that symptoms and functioning are one of many resource types that should be evaluated pre- and post-treatment. These findings should encourage the field of traumatic stress to develop interventions that assess the effects of the gain of various types of lost or at-risk resources on PTSD and other stress-related illness, and to include and standardize assessment of resource loss and gain in research using interventions that have proven efficacy for PTSD.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

| Instrument | Construct Assessed | * Validated or Self-Made |
|------------|--------------------|--------------------------|
| 1. Objective and Subjective Index of Threat Questionnaire | Objective and Subject Threat | Self-Made |
| 2. Changes in Life Domain Questionnaire | Subjective Evaluation of Changes In Life Domains and Coping Resources | Self-Made |
| 3. The Posttraumatic Stress Reaction Index | Severity of Posttraumatic Symptoms | Validated |
| 4. Coping Resources Questionnaire | Coping Resources | Self-Made |
| 5. Conservation of Resources—Evaluation (COR-E) | Resources | Validated |
| 6. Diagnostic and Statistical Manual of Mental Disorders (DSM) IV Criterion A for PTSD | Traumatic Events | Validated |
| 7. Hopkins Symptom Checklist-25 (HSCL-25) | Anxiety and Depression | Validated |
| 8. Demographic Questionnaire | Demographic Variables | Self-Made |
| Instrument                                                                 | Construct Assessed                                                                 | * Validated or Self-Made   |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------|
| 9.  Exposure to Terrorist or War-Related Event Questionnaire              | Terrorist Attacks or War Related Events Since Beginning of Al Aqsa Intifada          | Self-Made                 |
| 10. Economic Resources Questionnaire                                      | Loss of Economic Resources                                                          | Self-Made                 |
| 11. COR Theory Questionnaire                                              | Resources                                                                           | Self-Made                 |
| 12. Social Support Questionnaire                                          | Support Satisfaction                                                                 | Validated                 |
| 13. Ethnocentrism, Political Violence, and Authoritarianism Questionnaire | Protective Attitudes                                                                 | Self-Made                 |
| 14. Public Health Questionnaire                                           | Depressive Symptoms                                                                  | Validated                 |
| 15. Abbreviated Version of PTSD Symptom Scale                             | PTSD                                                                                | Self-Made                 |
| 16. PTSD Inventory                                                        | PTSD                                                                                | Validated                 |
| 17. PTSD Symptom Scale-Interview Format (PSS-I)                           | PTSD                                                                                | Validated                 |
| 18. Patient Health Questionnaire (PHQ-9)                                  | Depressive Symptoms                                                                  | Validated                 |
| 19. Resource Loss Scale for Children (RLSC)                               | Resource Loss                                                                       | Validated                 |
| 20. Self-Esteem Inventory                                                 | Self-Esteem                                                                         | Validated                 |
| 21. Life Orientation Test                                                 | Optimism                                                                            | Validated                 |
| 22. General Health Questionnaire-12                                       | General Psychological Distress                                                      | Validated                 |
| 23. Impact of Events Scale—Revised (IES-R)                                | Posttraumatic Stress                                                                | Validated                 |
| 24. Multidimensional Scale of Perceived Social Support (MSPSS)            | Social Support                                                                       | Validated                 |
| 25. PTSD Symptoms Scale—Self Report (PSS-SR)                              | PTSD                                                                                | Validated                 |
| 26. Center for Epidemiologic Studies Depression Scale (CES-D)            | Depression                                                                          | Validated                 |
| 27. Four Dimension Anxiety Scale (FDAS)                                   | Anxiety                                                                             | Validated                 |
| 28. September 11th Event Experiences Questionnaire                       | 9/11 Experiences                                                                    | Self-Made                 |
| 29. Lifetime Trauma Event Exposures Questionnaire                         | Lifetime Trauma Event Exposures                                                     | Self-Made                 |
| 30. Social Support Questionnaire                                          | Social Support                                                                       | Self-Made                 |
| 31. DSM IV Criteria for Panic Attacks                                     | Panic Attack Symptoms                                                               | Validated                 |
| 32. National Women’s Study (NWS) PTSD Module                             | PTSD                                                                                | Validated                 |
| 33. Major Depressive Scale from Structured Clinical Interview for DSM III—Revised | Depression                                                                        | Validated                 |
| 34. Brief Symptom Inventory (BSI)                                         | Psychiatric Symptoms                                                                | Validated                 |
| 35. Social Constraints Scale (SCS)                                        | Social Constraints                                                                   | Validated                 |
| 36. PTSD Stressor Criteria DSM-IV                                          | Stressfulness of Events                                                             | Validated                 |
| 37. Acceptance and Action Questionnaire (AAQ)                             | Acceptance and Action                                                               | Validated                 |
| 38. Post-Traumatic Stress Disorder Checklist—Civilian (PCL-C)             | PTSD                                                                                | Validated                 |
| 39. Life Trauma History                                                   | Traumatic Life Events Questionnaire                                                 | Validated                 |
| 40. Depression Anxiety Stress Scale 21 (DASS-21)                          | Psychological Distress                                                              | Validated                 |
| 41. Exposure to Shooting Incident Questionnaire                           | Exposure To Shooting                                                                | Self-Made                 |
| 42. Distressing Events Questionnaires (DEQ)                               | PTSD                                                                                | Validated                 |
| 43. Coping Strategies Inventory (CSI)                                     | Coping Strategies                                                                   | Validated                 |
| 44. State Trait Anger Scale (STAS)                                       | Anger                                                                               | Validated                 |
| 45. Mastery Scale                                                         | Mastery                                                                             | Validated                 |
| 46. Profile of Mood States (POMS)                                        | Depressive Mood                                                                     | Validated                 |
| 47. State-Trait Expression Inventory (STAXI)                              | Anger                                                                               | Validated                 |
| 48. Family Environment Services (FES)                                     | Family Support                                                                       | Validated                 |
| 49. Personality Characteristics Questionnaire                            | Personality Characteristics                                                         | Self-Made                 |
| 50. Serious Negative Life Events Questionnaire                           | Life-Change Events                                                                   | Validated                 |
| 51. Research Diagnostic Criteria—Depressive Symptoms Index               | Depressive Symptoms                                                                  | Validated                 |
Table A1. Cont.

| Instrument                                      | Construct Assessed         | * Validated or Self-Made |
|-------------------------------------------------|-----------------------------|--------------------------|
| 52. Duke Religious Index (DRI)                   | General Religiousness      | Validated                |
| 53. Religious Comfort and Strain Scale (RCSS)    | General Religiousness      | Validated                |
| 54. RAND Health Survey                           | Health and Adjustment      | Validated                |
| 55. Posttraumatic Growth Inventory               | Posttraumatic Growth       | Validated                |
| 56. Resistance Deficit Variables                | Generalized Resistance Resources | Self-Made            |
| 57. Sense of Coherence Scale                    | Sense of Coherence         | Validated                |
| 58. Florida Health and Family Life Instrument    | Psychological Dysfunction  | Validated                |
| 59. K6 Scale                                     | Psychological Distress     | Validated                |
| 60. Social Provisions Scale                      | Social Support             | Validated                |
| 61. Outlook and Sense of Identity Questionnaire  | Goal Orientation           | Self-Made                |
| 62. Reactive Responding—Short Form               | Goal Orientation           | Validated                |
| 63. Health and Hurricane Questionnaire           | Health and Hurricane Exposure | Self-Made            |
| 64. Flood Exposure Questionnaire                 | Flood Exposure             | Validated                |
| 65. Physical Symptoms Index                      | Physical Symptoms          | Validated                |
| 66. Social Integration Questionnaire             | Social Integration         | Self-Made                |
| 67. Frequency of Social Interaction Questionnaire| Frequency of Social Interactions | Self-Made            |

* “Validated” refers to there being support in the literature for the instrument having been shown valid with metric testing. “Self-made” refers to the instrument being made de-novo for the study cited.

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