A Dual-Model of Posttraumatic Stress and Posttraumatic Growth in a Community Sample of Female Conflict-Related Sexual Violence Survivors from Bosnia and Herzegovina

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Abstract

Background: Posttraumatic stress disorder (PTSD) and posttraumatic growth (PTG) are known psychological outcomes that can co-occur in the aftermath of a traumatic event. However, it is less clear how these outcomes interact – particularly for female survivors of conflict-related sexual violence (CRSV) – and to what extent intermediary factors play a role in this relationship.

Methods: In a sample of 192 war survivors from Bosnia & Herzegovina (n = 104 experienced CRSV, n = 88 did not), a structural equation model (LISREL 8.8) tested CRSV as a traumatic event, 'positive reinterpretation' (as a strategy of approach coping) and 'behavioural disengagement' (as a strategy of avoidance coping), and PTSD and PTG as psychosocial outcomes. A difference in the mechanisms by which

* DOI 10.7590/266644720X15989693725702 2666-447x 2020 Journal of Human Trafficking, Enslavement and Conflict-Related Sexual Violence

PTG and PTSD interact in the two subgroups was hypothesised, given the differences in the nature of the trauma they experienced.

Results: Through multiple indirect relationships, results showed that CRSV survivors respond to their trauma with both PTSD and PTG, suggesting a dual PTSD-PTG mechanism. As for coping strategies, positive reinterpretation predicted greater PTG, and behavioural disengagement predicted greater PTSD. In the sample of non-sexual violence survivors, positive reinterpretation also remained a significant predictor of PTG.

Conclusions: Positive reinterpretation as a coping strategy appears to be a stable characteristic that independently predicts PTG, irrespective of trauma type. Mental health professionals should take into account this mechanism when addressing the needs of CRSV survivors, but also war survivors more generally. Reframing traumatic events and post-trauma sequalae during treatment could lead to PTG and enhance recovery.

1. Background

The development of posttraumatic growth (PTG) in the aftermath of a traumatic event is a salutary association.[1] It is increasingly investigated across mental health literature, with much debate as to how this association is impacted by other factors and how it differs across different types of events.[2] PTG is understood as a 'significant beneficial change in cognitive and emotional life that goes beyond previous levels of adaptation or psychological functioning and is a way of living optimally in the wake of trauma'.[3] Some suggest that PTG can be viewed as a defence against the development of pathology following a traumatic event,[4] but it is likely to be more complex. There is moderate support for a curvilinear relationship between posttraumatic stress disorder (PTSD) symptomatology and PTG, whereby fewer PTSD symptoms may not be enough stimulation for a person to experience PTG, and a greater number of symptoms may result in mental health consequences that prevent the opportunity for PTG.[5] Other evidence suggests that adjustment to trauma is a process influenced

1 M Mittelmark and G Bauer, 'The Meanings of Salutogenesis' in M Mittlemark and G Bauer (eds), *The Handbook of Salutogenesis* (Springer 2017).

2 E Ulloa, M Guzman, M Salazar, and C Cala, 'Posttraumatic Growth and Sexual Violence: A Literature Review' (2016) 25 J Aggress Maltreat Trauma 286.

3 RG Tedeschi, C Park and LG Calhoun, 'Posttraumatic Growth: Future Directions' in RG Tedeschi and others (eds), *Posttraumatic Growth: Positive Changes in the Aftermath of Crisis* (Mahwah, New Jersey 1998) 1.

4 S Dekel, T Ein-Dor and Z Solomon, 'Posttraumatic Growth and Posttraumatic Distress: A longitudinal Study' (2012) 4 Psychol Trauma 94.

5 B Kleim and A Ehlers, 'Evidence for a Curvilinear Relationship Between Posttraumatic Growth and Posttrauma Depression and PTSD in Assault Survivors' (2009) 22 J Trauma Stress 45; Z Solomon and R Dekel, 'Posttraumatic Stress Disorder and Posttraumatic Growth Among Israeli Ex-POWs' (2007) 20 J Trauma Stress 303.

by factors that pre-date the trauma (eg socioeconomic status, family stability, a history of trauma) or psychosocial factors (eg personality, coping strategies, social support), as well as event characteristics (eg type, intensity, duration of exposure or perceived threat).[6]

Taking the type of event as an important factor in the possible development of psychological sequalae following trauma, differences begin to emerge. Events experienced by groups of people (eg natural disasters) tend to result in a strengthened common identity, manifestations of solidarity and improved self-esteem.[7] Events experienced personally by an individual, such as that of interpersonal violence of a sexual nature, can trigger a more complex reaction, including high rates of depression, anxiety and PTSD.[8] In some contexts, additional factors can contribute to subsequent outcomes. For example, how controllable the event was to the victim; whether they attribute the occurrence of the event to a personal characteristic; or whether it was under the control of another person or entity. Moreover, if a survivor of sexual violence negatively appraises their emotions and symptoms, or indeed if they perceive negative responses from others, there is a greater risk of developing PTSD.[9] This often stems from the shame and stigma that is associated with this type of violence, particularly in conflict settings,[10] that may be perceived differently to other non-interpersonal, war-related trauma, such as the death of a loved one. Findings among adolescent girls in the Democratic Republic of the Congo (DRC) showed that stigmatisation related to conflict-related sexual violence (CRSV) has a greater mediating impact on mental health outcomes, than the act itself.[11] Furthermore, CRSV often takes place among other forms of violence (eg looting and destruction of property), and comprises multiple forms of victimisation,[12] which may compound psychological outcomes and societal reactions.

With regard to psychosocial factors, it is understood that coping is the process by which people manage their stress following a traumatic event; either by doing something to alter the source of the stress, or by managing the emotional reac-

6 J Lawrence and J Fauerbach, 'Personality, Coping, Chronic Stress, Social Support and PTSD Symptoms among Adult Burn Survivors: A Path Analysis' (2003) 24 J Burn Care Rehabil 63.

7 D Garcia and B Rimé, 'Collective Emotions and Social Resilience in the Digital Traces After a Terrorist Attack' (1993) Psychol Sci 30.

8 A Verelst, M De Schryver, E Broekaert and I Derluyn, 'Mental Health of Victims of Sexual Violence in Eastern Congo: Associations with Daily Stressors, Stigma, and Labeling' (2014) 14 BMC Women's Health 106.

9 K Chivers-Wilson, 'Sexual Assault and Posttraumatic Stress Disorder: A Review of the Biological, Psychological and Sociological Factors and Treatments' (2006) 9 MJM 111.

10 D Mukwege and C Nangini, 'Rape with Extreme Violence: The New Pathology in South Kivu, Democratic Republic of Congo' (2009) 6 PLoS Med 1.

11 A Verelst and others, 'The Mediating Role of Stigmatization in the Mental Health of Adolescent Victims of Sexual Violence in Eastern Congo' (2014) 38 Child Abuse and Negl 1139.

12 D Haynes, 'Lessons from Bosnia's Arizona Market: Harm to Reconstruction Process' (2002) 158 Univ PA Law Rev 1779.

tions associated with it.[13] Several scholars have found approach coping styles (where a person seeks to resolve the stressor) to be positively correlated with PTG in people with experiences of interpersonal violence, and the opposite (actively avoiding the stressor) negatively associated with PTG.[14] Furthermore, it has been found that male and female survivors of sexual violence who disclosed their assault (as form of approach coping) were more likely to experience PTG.[15] This is a particularly important aspect of recovery for survivors, given that withdrawal from social networks often takes places in the aftermath of interpersonal trauma of a sexual nature.[16] In other research, however, positive relationships between avoidance strategies and psychological outcomes have been identified. Verelst and colleagues found that while certain symptoms may stem from direct emotional and psychophysiological responses to reliving traumatic sexual events, symptoms of avoidance may constitute a marker of a stigmatised social position within the individual's family and community.[17] Another explanation for this is that the use of avoidance strategies among women may be more commonly associated with greater distress in the aftermath of sexual violence, because the tendency to suppress thoughts about the stressor or denying its existence, may paradoxically lead to over-attention to the event.[18] This may initially serve as a protective mechanism to mitigate emotional distress following trauma.[19] However, among other populations, research has shown that avoidance coping strategies can lead to more positive adaptations in the short term, but have no, or even negative, effects in the long term.[20]

In a previous study based on the dataset presented in this article, findings from women in Bosnia and Herzegovina who experienced CRSV during the war from 1992-1995 showed that higher levels of positive reinterpretation (as

13 C Carver, MF Scheier and J Weintraub, 'Assessing Coping Strategies: A Theoretically Based Approach' (1989) 56 J Pers Soc Psychol 267.

14 A Elderton, A Berry and C Chan, 'A Systematic Review of Posttraumatic Growth in Survivors of Interpersonal Violence in Adulthood' (2017) 18 Trauma Violence Abus 223; S Ullman, 'Correlates of Posttraumatic Growth in Adult Sexual Assault Victims' (2014) 25 Trauma Violence Abus 219; M Brooks and others, 'Trauma Characteristics and Posttraumatic Growth: The Mediating Role of Avoidance Coping, Intrusive Thoughts, and Social Support' (2019) 11 Psychol Trauma 232.

15 A Cole, 'Differential Adjustment among Sexual Assault Survivors: Predicting Positive Outcome' (State University of New York at Binghampton 2008).

16 C Kılıç, K Magruder and M Koryürek, 'Does Trauma Type Relate to Posttraumatic Growth after War? A Pilot Study of Young Iraqi War Survivors Living in Turkey' (2016) 53 Transcult Psychiatry 110.

17 A Verelst and others (n 11).

18 H Littleton, 'The Coping Process of the Unacknowledged Rape Victim' (Virginia Polytechnic Institute 2003).

19 M London, M Mercer and M Lilly, 'Considering the Impact of Early Trauma on Coping and Pathology to Predict Posttraumatic Growth Among 9-1-1 Telecommunicators' (2017) J Interpers Violence 1.

20 T van Elderen, S Maes, J Madalinska, and I Komproe, 'Coping, angst en vitale uitputting na een coronair incident'. Een longitundinal onderzoek' (1996) Gedrag Gezond 207.

a form of approach coping, ie reframing the event and subsequent sequalae) and lower levels of behavioural disengagement (as a form of avoidance coping, ie withdrawing effort from achieving the goal with which the stressor interferes) were associated with a greater degree of PTG.[21] These domains of coping likely represent mediators for pathogenic and salutary outcomes: positive reinterpretation as a buffer against, and behavioural disengagement as a risk factor for, lower measured PTG. Regression analyses indicated that the severity of posttraumatic symptomatology was not significantly associated with PTG, which may be attributable to the fact that PTSD was identified in more than ninety percent of the sample.

Nonetheless, such findings can only tell us so much. We know that coping provides a person with the emotional and behavioural tools to appraise and assess a situation for threat, which can be a protective factor in times of distress and buffer against psychological suffering. However, whether this occurs directly (where an increase in coping skills will result in an increase in PTG irrespective of the existing level of PTSD) or indirectly (protecting persons from the potentially pathogenic influence of stressful events) remains unclear. Prior analyses have potentially been too simplistic. This occurs particularly as a result of the difficulty in obtaining retrospective data in certain populations and a reliance on cross-sectional studies, and therefore an inability to make causal inferences.[22] Given the evidence, the most likely interaction is that events themselves do not result directly in PTSD/PTG,[23] but individuals will respond to stress with a mixture of resilience-promoting resources and vulnerability to mental illness[24] – a dual mechanism – rather than PTG falling on the 'adaptive' end of a single spectrum of post-trauma adjustment.[25] This results in multiple indirect relationships between trauma, PTG and PTSD that may be influenced by psychosocial factors such as coping. The purpose of this paper is to delve deeper into the possibility of a dual mechanism by which PTG and PTSD interact in the aftermath of trauma, and to explore the extent to which they are impacted by certain coping strategies. Findings from this study are expected to have important clinical implications regarding the support of CRSV survivors. As Bosnia goes through a long-overdue investigation of war crimes that took place during the

21 K Anderson and others, 'Predictors of Posttraumatic Growth among Conflict-Related Sexual Violence Survivors from Bosnia and Herzegovina' (2019) 13 Confl and Health 23.

22 A Cole and S Lynn, 'Adjustment of Sexual Assault Survivors: Hardiness and Acceptance Coping in Posttraumatic Growth' (2010) 30 Imagin Cogn Pers 111.

23 Brooks and others (n 14).

24 J Shakespeare-Finch and J Lurie-Beck, 'A Meta-Analytic Clarification of the Relationship between Posttraumatic Growth and Symptoms of Posttraumatic Distress Disorder' (2014) 28 J Anxiety Disord 223; P Kuwert and others, 'Long-Term Effects of Conflict-Related Sexual Violence Compared with Non-Sexual War Trauma in Female World War II Survivors: A Matched Pairs Study' (2014) 43 Arch Sex Behav 1059.

25 R Tedeschi and L Calhoun, 'The Post-Traumatic Growth Inventory: Measuring the Positive Legacy of Trauma' (1996) 9 J Trauma Stress 455.

conflict, the acts of CRSV, trafficking and enslavement are likely to come to the fore once again. This is particularly poignant for the stigmatisation felt by CRSV survivors, and the role it plays in recovery and long-term outcomes. It can help clinicians and mental health workers understand what to address in interventions based on a holistic view of the women, their experiences and their reactions to it. Focusing on recovery does not mean that a traumatic event did not occur, or symptoms necessarily disappear,[26] but understanding a PTSD-PTG mechanism and associated coping strategies may serve to prepare and buffer survivors against further mental deterioration. As such, we have conceptualised a model to explore this process.

1.1. The Hypothesised Model

On the basis of earlier analyses and existing literature on the subject, our hypothesised model explored a possible PTSD-PTG mechanism specified by: five pathways between experiencing CRSV; positive reinterpretation and behavioural disengagement as strategies of coping; and PTSD severity and PTG as psychosocial outcomes. At the core of this model, several indirect relationships were specified between the experience of sexual violence and PTG. On one hand, 1) experiencing CRSV can lead to higher PTSD scores which may result in lower measured PTG; 2) CRSV can lead to the use of behavioural disengagement (as an avoidance coping strategy), which could lead to lower measured PTG; and 3) this second pathway could be further mediated by PTSD. On the other hand, 4) the experience of CRSV could lead to positive reinterpretation of the event (as an approach coping strategy) which could result in higher measured PTG; and 5) this relationship could be further mediated by behavioural disengagement and has a negative impact on PTG. Given the difference in trauma types between the subsamples and the mechanisms by which coping influences psychosocial outcomes, the final model for the non-sexual violence survivors is expected to fit differently. The hypothesised model is presented in figure 1.

[26] W Anthony, 'Recovery from Mental Illness: The Guiding Vision of the Mental Health Service System in the 1990's' (1993) 16 Psychosoc Rehabilitation 11.

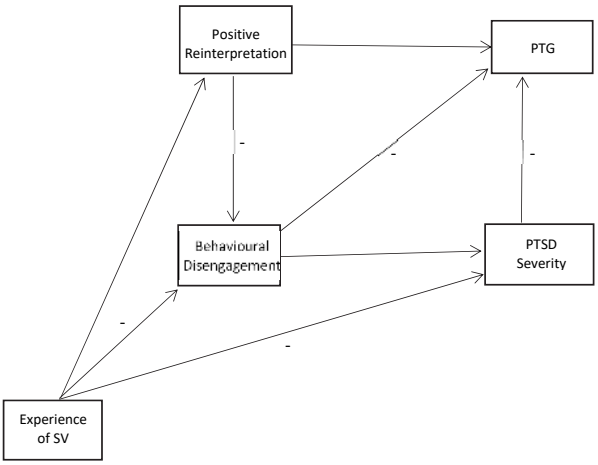

Figure 1. Hypothesised Model of Relationships between the Experience of Sexual Violence and Outcomes PTSD Severity and PTG

The core assumption when testing this model is that the relationship between CRSV and PTG is mediated by psychosocial factors such as coping. Multiple indirect relationships are presented, that specify strategies of coping that buffer against PTSD and promote PTG and contribute to explaining this dual mechanism. These assumptions are tested using a structural equation modelling approach within a sample of CRSV survivors from Bosnia and Herzegovina and compared to a group of war survivors who did not experience CRSV. The research has three main hypotheses: 1) PTG and PTSD will both be possible psychosocial outcomes among this war-affected population; 2) the explanatory mechanisms for PTG among CRSV survivors will be different from participants who did not experience CRSV, and 3) higher measured PTG among CRSV survivors will be associated with greater positive reinterpretation as an approach coping strategy, and lower behavioural disengagement as an avoidance coping strategy. A more detailed understanding of these mechanisms – the interrelationships and the differences between those who experienced CRSV and those who did not – will shed light onto the dual PTSD-PTG mechanism and might have important implications for how to support survivors of CRSV towards PTG and recovery.

2. Methodology

2.1. Design and setting

The data presented here are part of a cross-sectional study on the quality of life and long-term psychological consequences among women

with experiences of CRSV during the conflict in Bosnia and Herzegovina. During this conflict, women are believed to have been subjected to CRSV by civilians, locally stationed and foreign military forces[27] and even peacekeepers.[28] The present study refers to the United Nations (UN) definition of CRSV, as: 'rape, sexual slavery, forced prostitution, forced pregnancy, forced abortion, enforced sterilization, forced marriage, and any other form of sexual violence of comparable gravity perpetrated against women, men, girls or boys that is directly or indirectly linked to a conflict',[29] and specifically to rape. Data used in this study were collected by the research team from December 2012 to December 2014, twenty years after the start of the war. Results elsewhere have shown that more than half of female CRSV survivors still suffered from PTSD more than two decades after the start of the war.[30] Ethical approval was given by the Human Research Ethics Board of the Medical Faculty of the University of Tuzla, Bosnia and Herzegovina.

2.2. Participants

Female survivors of CRSV in this study were recruited by author AD, with the assistance of the Bosnian non-governmental, non-profit organisation Association for Women Victims of War, who campaign for the rights of women and girls who experienced sexual violence during the conflict, and possess a database of more than 700 CRSV survivors. Participants were eligible for inclusion in this study if they had been residents of Bosnia and Herzegovina during and after the war and were between 30-65 years old at the time of study. On the basis of a study screening measure of cognitive functioning (Mini

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27 A Delić, P Kuwert and H Glaesmer, 'Should the Definition of the Term "Children Born of War" and vulnerabilities of children from recent conflict and post-conflict settings be broadened?' (2017) 46 Act Med Acad 67; I Skjelsbæk, 'Victim and Survivor: Narrated Social Identities of Women Who Experienced Rape during the War in Bosnia-Herzegovina' (2006) 16 Fem Psychol 373; T Salzman, 'Rape Camps as a Means of Ethnic Cleansing: Religious, Cultural, and Ethical Responses to Rape Victims in the Former Yugoslavia' (1998) 20 HRQ Quarterly 348; C Benard, 'Rape as Terror: The Case of Bosnia' (1994) 6 Terror Polit Violenc 29.

28 K Jennings and V Nikolić-Ristanović, 'UN Peacekeeping Economies and Local Sex Industries: Connections and Implications' (2009) MICROCON Research Working Paper 17 <DOI: 10.2139/ssrn.1488842> accessed 3 April 2019.

29 UNSC, 'Report of the Secretary-General on Conflict-Related Sexual Violence' (S/2017/249) 15 April 2017.

30 Medica Zenica and Medica Mondiale, '"We Are Still Alive. We Have Been Harmed but We Are Brave and Strong", A Research on the Long-Term Consequences of War Rape and Coping Strategies of Survivors in Bosnia and Herzegovina' (2014). <https://www.medicamondiale.org/fileadmin/redaktion/5_Service/Mediathek/Dokumente/English/Documentations_studies/141205_Summary_Research_We-Are-Still-Alive_CR-Medica-Zenica_medica-mondiale.pdf> accessed 1 May 2018.

Mental Status Examination, MMSE[31]) women were excluded with scores < 23 (out of a possible score of 30, with 24 indicating normal cognition) or those with a psychiatric history prior to the war. Participants for the CRSV group were eligible if they had experienced sexual violence during the years 1992-1995 and had disclosed this to the association. A control group of women who did not experience sexual violence during the war (non-CRSV), but met other study criteria, was selected from the general population using a method of snowball sampling. This subsample served as way to isolate the impact of CRSV from other wartime events experienced by the entire sample (eg separation from family members, loss of loved ones, displacement).

2.3. Procedures

A multistage sampling method was employed to reach the civilian population who experienced sexual violence during the war. Seven localities across Bosnia and Herzegovina were identified as having the greatest density of registered CRSV survivors and using the list of registered female members of the association, the President of the Association for Women Victims of War telephoned survivors from selected localities to provide them with information about the research project and invite them to voluntarily participate in the study. For those who consented, the initial interview was then conducted in person by AD in two or more sessions, with breaks upon request. Psychiatric history was discussed with participants and corroborated by medical notes if available. Given the sensitive nature of the research, referral information for psychological counselling and support was provided.

Interviews were carried out with a total of 110 CRSV survivors, of which three later withdrew their consent, two were excluded due to MMSE < 23, and one participant was excluded due to missing data. Contact persons from the local NGOs, mental health facilities or psychiatric clinics that provided space for interviews for CRSV survivors were asked to recommend other women who may be willing to participate. Those who were interviewed were asked to identify other potential participants, who were then contacted and followed-up. This gave a total sample of $n = 192$ for analysis, see table 1 later on for demographic information.

2.4. Measures

In this study, the following measures have been used:

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31 M Folstein, S Folstein and P McHugh, '"Mini-Mental State". A Practical Method for Grading the Cognitive State of Patients for the Clinician' (1975) 12 J Psychiatr Res 189.

- *Socio-demographic questionnaire*: a self-developed questionnaire was developed by author AD to gather sociodemographic data. Items were predominantly categorical, including ethnic affiliation, age, marital status, education, employment status, data on the context of CRSV, and any involvement in psychosocial support programmes.
- *Harvard Trauma Questionnaire (HTQ)*:[32] a version for Bosnia and Herzegovina was used to explore experiences of traumatic events and assess the presence of PTSD symptomatology.[33] Only the first and fourth parts were used in this study. The first part is a list of possible traumatic events that civilians could potentially have been exposed to during the war, for which there is a yes/no response format. Events include material deprivation, conditions relating to war, bodily injury, forced confinement and coercion, being forced to harm others, disappearance, death or injury to loved ones, and witnessing violence to others. The fourth part contains forty statements about possible psychosocial difficulties caused by trauma. The first sixteen statements are derived from DSM-IV criteria for PTSD and inquire about the symptoms of the PTSD domains: re-experiencing the traumatic event, avoidance, and hyperarousal. The scale for each response in these sections are rated from one ('not at all') to four ('very strongly'), whereby a mean item score of two-and-a-half or above is considered an indicator for symptoms of PTSD. Symptoms are grouped into three phenomena: re-experiencing traumatic experiences, avoiding and numbing, and psychological arousal, of which there are four, seven and five items respectively. This measure has been used reliably in a study of Bosnian women affected by war[34] with reportedly high internal consistency for traumatic symptoms (Cronbach's $\alpha = 0.95$). In this study, the HTQ demonstrated very high reliability and internal consistency with Cronbach's $\alpha = 0.96$ for the PTSD symptom scale.
- *Adapted validated Croatian scale*: the Bosnian version of the Coping Orientations to Problems Experienced Scale (COPE) used in this study is an adaption of the validated Croatian scale.[35] It is a 71-item scale to assess how people respond when they are confronted with difficult or stressful situations, whereby respondents rate each statement on a scale from 0 ('never') to 4 ('I always do this'). It produces 15 subscales that mirror the original

32 R Mollica, Y Caspi-Yavin, P Bollini and T Truong, 'The Harvard Trauma Questionnaire: Validating a Cross-Cultural Instrument for Measuring Torture, Trauma, and Posttraumatic Stress Disorder in Indochinese Refugees' (1998) 180 J Nerv Ment Dis 111.

33 K Allden and others, 'Harvard Trauma Manual: Bosnia-Herzegovina Version' (Cambridge, Harvard Program in Refugee Trauma 1998).

34 M Klaric and others, 'Social Support and PTSD Symptoms in War-Traumatized Women in Bosnia and Herzegovina' (2008) 20 Psychiatr Danub 466.

35 J Hudek-Knežević, I Kardum and Ž Vukmirović, 'The Structure of Coping Styles: A Comparative Study of Croatian Sample' (1999) 13 Europ J Pers 149.

COPE-60,[36] which include problem-focused, emotion-focused and disengagement dimensions, and reflect the activities from a particular coping domain. Subscales are calculated using the mean score of items. Based on results from prior research[37] two subscales were used in this study: 'positive reinterpretation' is comprised of 4 items (eg 'I try to make it seem more positive'), and behavioural disengagement is comprised of 5 (eg 'I admit to myself I can't deal with and quit trying'). In the validated Croatian version, 'substance use' referred exclusively to alcohol, in the Bosnian translation, this referred only to the use of sedatives. This scale has been used successfully in existing research.[38] In this study, positive reinterpretation – reframing negative experiences – had an alpha of .57 and behavioural disengagement – withdrawing effort from addressing the source of stress – of α.72.

– *Posttraumatic Growth Inventory (PTGI)*:[39] the PTGI is a 21-item self-report scale for assessing psychological growth following a traumatic event, in this case framed in the context of participants' experiences of CRSV. The PTGI includes five subscales: new possibilities (eg 'I established a new path for my life'), relating to others (eg 'I feel a sense of closeness with others'), personal strength (eg 'knowing I can handle difficulties'), spiritual change (eg 'I have a stronger religious faith'), and appreciation for life ('I appreciate each day'). Total scores on the PTGI range from 1 to 126, with higher scores reflecting greater perceived growth, and items uses a response format that ranges from 1 ('I did not experience this change as a result of my crisis') to 6 ('I experienced this change to a very great degree as a result of my crisis'). The PTGI has been successfully implemented in a study of Israeli war veterans,[40] who report high reliability for total scores (Cronbach's $\alpha = 0.94$). In the present study, Cronbach's α for the PTGI total score was 0.96 and ranged from 0.66 to 0.90 for subscale scores.

2.5. Data analyses

The samples of CRSV survivors and non-CRSV survivors were tested on differences in sociodemographic characteristics using t-tests and chi-

36 C Carver, M Scheier and J Weintraub, 'Assessing Coping Strategies: A Theoretically Based Approach' (1989) 56 J Pers Soc Psychol 267.
37 Anderson and others (n 21).
38 V Antičević, G Kardum and D Britvić, 'War Veterans' Quality of Life: The Impact of Lifetime Traumatic Experiences, Psychological and Physical Health-Related Characteristics' (2011) 20 Drus Istraz 1101.
39 Tedeschi and Calhoun (n 25).
40 Dekel, Ein-Dor and Soloman (n 4).

square tests. T-tests were also used to compare means of study outcome variables.

First, the hypothesised model was tested to assess the extent to which it fit the data within the total sample, and separately for the groups CRSV survivors and non-CRSV survivors. The hypothesised model was evaluated with structural equation modelling using LISREL 8.8. Five goodness-of-fit measures were used in this study. Firstly, the chi-square (χ^2) was included as a measure of the discrepancy between variance–covariance matrices of the variables used in the model; and the (constructed) variance–covariance matrix derived from the specified relationships in the model. A non-significant χ^2 refers to the resemblance between the specified relationships in the hypothesised model and interpretations of the variances-covariances in the data matrix (ie validity of the structural equation model (SEM) explaining the (co)variances of the data matrix). Secondly, the root-mean-square error of approximation (RMSEA) was used which refers to the difference between the data variance-covariance matrix and the model-based matrix fit to the data, per degree of freedom. This estimate should be less than .05 to indicate close fit. Confidence intervals (90%) of RMSEA are provided. Thirdly, the comparative fit index (CFI) was included which assumes that all latent variables are uncorrelated and compares the sample covariance matrix with this null model. Values for this statistic range between 0.0 and 1.0 with values closer to 1.0 indicating good fit; Fourthly, the standardised root mean square residual (SRMR) was used which assess the difference between the residuals of the sample covariance matrix and the hypothesised covariance model. Values for the SRMR range from 0 to 1.0 with well-fitting models obtaining values less than .05. Fifthly, the non-normed fit index (NNFI) was included, which assesses the model by comparing the χ^2 value of the model to the χ^2 of the null model. Values for this statistic range between 0 and 1 with values greater than 0.90 indicating a good fit.

Statistical modelling was done by inclusion and exclusion of relationships between variables, that, underpinned by theory and supported by modification indices provided by the LISREL software, gave alternative models. These alternative models are evaluated by means of the five goodness-of-fit measures. Only standardised estimated paths with t values > 1.98, thus only paths with a significance of $p < .05$, are included in the modelling process. Relative effect sizes are defined using standardised path coefficients, as seen in figures 2-4. The 'most likely best-fitting' (MLBF) model and its specified relationships obtained from the CRSV survivors group was then tested on the non-CRSV group. This type of statistical modelling has been used successfully elsewhere in mental

health research to predict healthcare consumption,[41] community social capital,[42] and postpartum posttraumatic stress.[43]

Finally, post hoc multi-group analyses were conducted to determine whether the model performed differently as a function of subgroup, by estimating the model freely for CRSV survivors and non-CRSV survivors. This unconstrained model was then compared to models in which the parameters were constrained to be equal across groups. In doing so, it is possible to test specific hypotheses about group differences by constraining individual parameters and then comparing model fit.[44]

3. Results

The total study sample comprised 192 female participants (n = 104 CRSV survivors and n = 88 non-CRSV survivors). The largest proportion of women in both groups were of Bosniak ethnicity, but CRSV survivors were significantly older than non-CRSV survivors. Fewer CRSV survivors were married, educated above primary school level or currently employed. Regarding the circumstances of sexual violence, 45.2% (n = 47) of women indicated that they were raped three or more times during the conflict, with almost a third (29.8%, n = 30) having been raped by three or more perpetrators. The majority of women (76%, n = 79) did not know their perpetrators. Women were on average 29.6 (SD 8.9) years old (range 12-48) when their first experience of sexual violence took place. Fourteen women (13.5%) indicated that they became pregnant as a result of being raped, of whom 10 (9.6%) had this pregnancy terminated. Scores on study variables fell in the expected directions: survivors of CRSV scored higher in terms of PTSD severity (current PTSD symptomatology above a threshold of >2.5 was detected in 92.3% (n = 96) of CRSV survivors, and in 27.3% (n = 24) of non-CRSV survivors), traumatic load and behavioural disengagement; and lower on PTG and positive reinterpretation (table 1).

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41 A Kamperman, I Komproe and J de Jong, 'Migrant Mental Health: A Model for Indicators of Mental Health and Health Care Consumption' (2007) 26 Health Psychol 96.

42 T Wind and I Komproe, 'The Mechanisms that Associate Community Social Capital with Post-Disaster Mental Health: A Multilevel Model' (2012) 75 Soc Sci Med 1715.

43 M van Son and others, 'Prenatal Depression, Mode of Delivery and Perinatal Dissociation as Predictors of Postpartum Posttraumatic Stress: An Empirical Study' (2005) 12 Clin Psychol Psychother 297.

44 M Bosmans and others, 'Assessing Perceived Ability to Cope With Trauma: A Multigroup Validity Study of a 7-Item Coping Self-Efficacy Scale' (2015) 33 Eur J Psychol Assess 55; M Jordans and others, 'Screening for Psychosocial Distress amongst War-Affected Children: Cross-Cultural Construct Validity of the CPDS' (2009) 50 J Child Psychol Psychiatry 514; Kamperman, Komproe and De Jong (n 41).

	CRSVs (n = 104)		Non-CRSVs (n = 88)		
	Mean	**SD**	**Mean**	**SD**	**Statistical test**
Age	48.85	8.72	44.78	7.39	t = 3.44*
	n	**(%)**	***n***	**(%)**	
Ethnicity					
Bosnian	94	90.4	80	90.9	$\chi^2(2) = 1.178$
Croatian	5	4.8	6	6.8	
Serbian	5	4.8	2	2.3	
Marital status					
Married	59	56.7	71	80.7	$\chi^2(3) = 11.440$*
Single	12	11.5	2	2.3	
Widowed	22	21.1	8	9.1	
Divorced	11	10.6	7	7.9	
Education					
No schooling	14	13.5	1	1.1	$\chi^2(3) = 26.375$*
Primary education	32	30.8	10	11.4	
Secondary education	52	50.0	62	70.5	
Higher education	6	5.8	15	17.0	
Work					
Employed	16	15.4	57	64.8	$\chi^2(2)$= 50.522*
Unemployed	71	68.3	28	31.8	
Retired	17	16.3	3	3.4	
	Mean	**SD**	**Mean**	**SD**	
HTQ (No. events)	25.52	5.78	6.01	5.40	*t(190) = 24.03**
HTQ (PTSD severity)	3.19	.45	1.92	.70	*t(190) = 14.59**
PTGI (total score)	58.94	23.01	68.79	24.19	*t(190) = -2.85**
COPE Positive reinterpretation	9.09	2.87	10.25	2.96	*t(190) = -2.76**
COPE Behavioural disengagement	8.65	3.74	4.81	3.51	*t(190) = 7.30**

*p = <.01
HTQ: No. events, PTSD severity (mean score items 1-16)
PTGI: Posttraumatic growth inventory total score
COPE: Coping Orientations to Problems Experienced Scale (Bosnian)

Table 1. Demographic Characteristics of the Study Samples

3.1. The hypothesised model

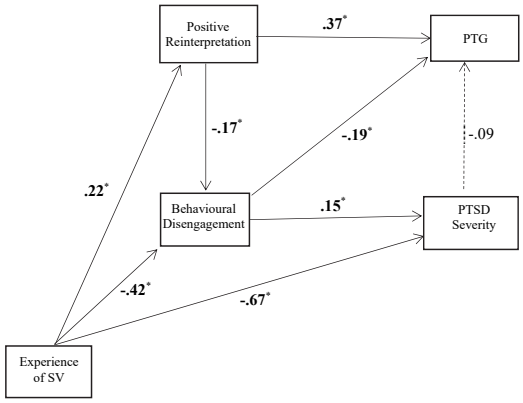
Structural equation modelling was performed on data from 185 participants, 7 cases of non-CRSV survivors were removed from the analysis because of multiple missing values. The correlations between the variables specified in the hypothetical model are given in Table 2.

	PTGI Total	COPE Positive Reinterpretation	COPE Behavioural Disengagement	PTSD Total	CRSV vs non-CRSV
PTGI Total	1.00				
COPE Positive Reinterpretation	0.41	1.00			
COPE Behavioural Disengagement	-0.25	-0.26	1.00		
PTSD Total	-0.06	-0.19	0.46	1.00	
CRSV vs non-CRSV*	0.10	0.22	-0.46	-0.74	1.00

n = 185
PTGI: Posttraumatic growth inventory total score
PTSD: HTQ (Bosnian) Mean score items 1-16
COPE: Coping Orientations to Problems Experienced Scale (Bosnian)
* point-biserial correlation

Table 2. Correlations between the Variables specified in the Hypothesised Model

The hypothesised model showed no acceptable fit with the variance-covariance matrix of the data for the total sample (χ^2 (2) = 8.54, CFI = .97, RMSEA = .13, SRMR = .034, NNFI = .86, p < 0.5). In this model, seven pathways were significant. As expected, the experience of CRSV was significantly related to both types of coping strategies (positive reinterpretation and behavioural disengagement in positive and negative directions, respectively). Positive reinterpretation was associated with higher measured PTG, and behavioural disengagement was associated with lower measured PTG, as well as greater PTSD symptom severity. The path from PTSD to PTG produced a non-significant effect (p > 0.05). See figure 2.

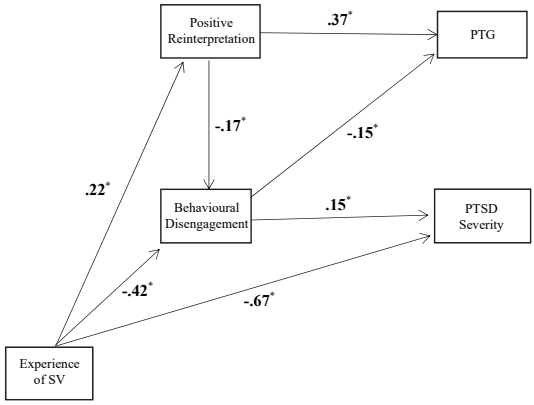


Model fit indices: χ^2 (3) = 10.09, p = < .05; 90% RMSEA = 0.11, CI = 0.038 – 0.19

* Standardised estimated paths with a significance of p < .05

Figure 2. Tested Structural Model of Relationships between the Experience of Sexual Violence and Outcomes PTSD Severity and PTG

With a theoretical underpinning and guided by modification indices provided by LISREL, the model was optimised by removing the pathway between PTSD and PTG. Remaining pathways continued to be statistically significant, but overall the model still showed no acceptable fit with the data (χ^2 (3) = 10.09, CFI = .97, RMSEA = .052, SRMR = .035, NNFI = .90, p = < .05). The optimised model (MLBF) is shown in Figure 2b. Based on the rationale that the experience of CRSV generates different PTSD-PTG mechanisms, the hypothesised model was proceeded to be tested in each individual subgroup.



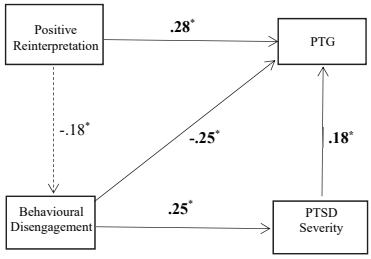
Model fit indices: $\chi 2$ (3) = 10.09, CFI = .97, RMSEA = .052, SRMR = .035, NNFI = .90, p = < .05

* Standardised estimated paths with a significance of p < .05

Figure 2b. Optimised Structural Model of Relationships between the Experience of Sexual Violence and Outcomes PTSD Severity and PTG

3.2. Adequateness of the model in the CRSV survivors sample

The hypothesised model showed an acceptable fit with the CRSV survivors data (χ^2 (1) = 1.29, CFI = .99, RMSEA = 0.11, SRMR = .036, NNFI = .93, p = > .05). The relationship between coping strategies positive reinterpretation and behavioural disengagement was non-significant, though positive reinterpretation was still directly related to PTG. In addition, the negative relationship between behavioural disengagement and PTG remained significant, as well as when mediated by PTSD severity. See figure 3.



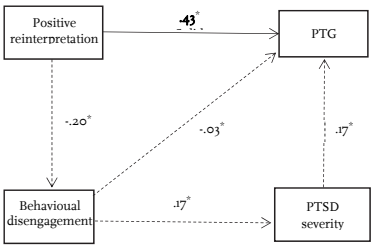
Model fit indices: $\chi 2$ (1) = 1.29, CFI = .99, RMSEA = 0.11, SRMR = .036, NNFI = .93, p = > .05

* Standardised estimated paths with a significance of p < .05

Figure 3. Tested Structural Model of Relationships between PTSD Severity and PTG – SSVs (n = 104)

3.3. Adequateness of the model in the non-CRSV sample

The hypothesised model also fit the non-CRSV data, although it was a less close fit between the data variance-covariance matrix and the model-based matrix to the data, χ^2 (1) = 1.30, CFI = .98, RMSEA = 0.061, SRMR = .043, NNFI = .91, p = > 0.05). In this sample, PTG was still directly impacted by positive reinterpretation, but all other associations were spurious. See figure 4.



Model fit indices: χ2 (1) = 1.30, CFI = .98, RMSEA = 0.061, SRMR = .043, NNFI = .91, p = > 0.05

* Standardized estimated paths with a significance of p < .05

Figure 4. Tested Structural Model of Relationships between PTSD Severity and PTG – non-SSVs (n = 81)

3.4. Post hoc multi-group analyses

Finally, we used SEM to test the presented model found in the total sample on its adequacy for both sub samples, by using a multi-group analysis. The χ^2 for the total model with two subgroups was 8.41 (7), NNFI= 0.94, p = 0.30. The χ^2 for the earlier found model (see above) tested in the CRSV group data was 3.10 (36.87% of total); the χ^2 for the earlier found model (see above) tested in the non-CRSV group data was 5.31 (63.13%). None of the unspecified relationships between the four variables had modification indices above 3, thus contributing significantly to the tested model in both subsamples.

4. Discussion

The aim of this study was to examine the role of two coping strategies (positive reinterpretation and behavioural disengagement) in two psychosocial outcomes following CRSV (PTSD and PTG). These variables have been documented as playing important roles in the aftermath of trauma in existing literature and earlier findings from the research team, but this is the first study to explore the interrelationships between them. Participants were part of a community-based sample from Bosnia and Herzegovina that included both

CRSV survivors and war survivors who did not experience sexual violence during the 1990s conflict. The possibility of PTSD and PTG being separate outcomes – as opposed to opposite ends of a single spectrum – was explored, which would substantiate a dual mechanism of distress and growth. In order to investigate this mechanism in a cross-sectional dataset, SEM was used to test relationships between variables.

Since we hypothesised a difference between the two subsamples (based on whether they did or did not experience CRSV), to ensure the validity of the model it was tested first overall, and then, removing the exposure variable of CRSV, we tested the model's adequacy for both subgroups. This difference was specified based on literature that distinguishes between outcomes for war-related trauma and CRSV: the difference being that uncontrollable, interpersonal events such as CRSV have the potential to challenge personal resources and characteristics,[45] and come with connotations of shame[46] and stigma,[47] and may therefore impact the development of PTG.

Our findings offer support for our first hypothesis, that PTSD and PTG are both possible co-occurring psychosocial outcomes, substantiating the presence of a dual PTSD-PTG mechanism. Thus, it is possible for women to respond to war-related traumatic events with both distress and growth, corresponding to existing research.[48] In our model for the total sample, a lower PTSD symptom severity did not predict greater PTG. By way of multiple indirect relationships, participants were more likely to experience PTG if they were able to employ a personal resource enabling them to positively reinterpret the event and subsequent psychological sequalae, by reframing the impact of their experiences.

With regards to our second and third hypotheses, our results confirmed a difference in the explanatory mechanisms when the model was tested in each subsample. The difference being that positive reinterpretation significantly predicted PTG in the subsample of CRSV survivors, as well as in the non-CRSV group. But an additional relationship was found between higher behavioural disengagement and greater PTSD, which reduced the amount of PTG overall, for CRSV survivors. Thus, this type of avoidance coping after experiencing sexual trauma is likely a risk factor for lower measured PTG, which supports existing findings in similar vulnerable groups.[49] Additionally, in this subsample of CRSV survivors, a positive relationship between PTSD and PTG was detected, which supports earlier findings that suggest maladaptive personal resources (such as avoidant coping that is a risk factor for psychopathology including

45 Chivers-Wilson (n 9).
46 Mukwege and Nangini (n 10).
47 Verelst and others (n 11).
48 Kuwert and others (n 24); Shakespeare-Finch and Lurie-Beck (n 24); Tedeschi and Calhoun (n 25).
49 Brooks and others (n 14).

PTSD) may influence the development of PTG.[50] This finding may reflect the extent to which women report higher levels of PTG to offset their emotional distress, on the premise that PTG can have a constructive side, as well as an illusory side; certain aspects of self-deception or denial that positively distort beliefs, still allow for PTG to prosper.[51] For women who survived the war but did not experience CRSV no other relationships remained significant.

The findings of this study have important implications for supporting survivors of CRSV towards recovery, particularly given that sexual trauma continues to have far-reaching and long-lasting consequences that still often go unresolved.[52] Trauma-focused psychotherapeutic techniques that are provided to individuals experiencing PTSD have cognitive elements that allow a person to process traumatic experiences, by altering the relationship between the original emotional response and current distress.[53] In principle, such techniques guide individual behaviour toward a more adaptive response to trauma. A stronger salutary component, and further harnessing strategies that permit these altered relationships – such as reframing the psychological sequalae following sexual trauma – could be highly beneficial to survivors. This is particularly important when addressing the minutiae of the types of (additional) CRSV experienced. Survivors are likely to have a complex narrative of CRSV, depending on the frequency with which it took place, whether survivors knew their perpetrators and whether they experienced enslavement or human trafficking.

Nonetheless, individual treatment is unlikely to capture the shared experience of CRSV that brings survivors together as part of the Association for Women Victims of War. Such group support may be of particular importance as BiH goes through a long-overdue process of investigation of the war crimes that took place, which bring up feelings of stigma and/or shame and cause psychological deterioration.

By considering the stability of this dimension of coping as personal resource, strengthening its capacity through psychoeducation, guidance or coaching nourishes the opportunity to promote PTG. Equally, a reduction in avoidance

50 London, Mercer and Lilly (n 19).

51 A Maercker and T Zoellner, 'The Janus Face of Self-Perceived Growth: Toward a Two-Component Model of Posttraumatic Growth' (2004) 15 Psychol Inquiry 41.

52 P Kuwert and others, 'Trauma and Current Posttraumatic Stress Symptoms in Elderly German Women who Experienced Wartime Rapes in 1945' (2010) 198 J Nerv Ment Dis 450; Medica Zenica and Medica Mondiale (n 30).

53 NICE, 'Posttraumatic Stress Disorder: Management. Clinical Guideline' (2018) <https://www.nice.org.uk/guidance/cg26/resources/posttraumatic-stress-disorder-management-pdf-975329451205> accessed 11 September 2018.

coping strategies has been shown to enhance PTG following different types of trauma,[54] which may prevent maladaptive strategies prolonging distress.[55]

However, given the result that positive reinterpretation was a predictor of PTG across both subsamples of this study, it appears to be a key protective factor in the aftermath of trauma; acting as a buffer against lower measured PTG for war-affected persons more generally. This highlights its importance as a personal resource following different types of trauma and could mean that this 'reframing' mechanism is a characteristic that acts as a buffer against the negative consequences of war-related trauma.

Yet, cultural and societal factors influence how trauma is managed and processed in post-conflict settings and could explain the differences between trauma types in terms of their relationship to PTG.[56] This is particularly relevant given that stigmatisation towards CRSV survivors in some places is known to still play an important mediating role in mental health outcomes, and often has a greater impact than the act itself.[57] When discussing with survivors their experiences of CRSV, whether in treatment or research, it is important to address the needs of CRSV survivors, perceived by themselves, as this remains key in their recovery trajectory given the specific way in which these women have experienced violence or loss, and the impact of living through war.

4.1. Limitations

Despite the strength of these findings, this study is not without limitations. Primarily, there are some methodological concerns regarding the type of measures, as well as the sampling techniques used in this study that should be considered when interpreting the findings. First, the measures implemented to acquire information on PTSD, PTG and coping were self-report questionnaires, and are therefore interpreted as subjective indicators and not objective measurements. Underreporting or misinterpretation of events or symptomatology may occur within such measures. This is particularly the case for PTSD, for which we used a screener of symptoms, but requires a subsequent clinical interview for a confirmation of diagnosis. Moreover, the low internal consistency of the COPE subscales may reflect possible discrepancies in the translation/adaption or interpretation of the scale, or a lack of rigorous cross-cultural validity of the different defined coping domains. For instance, the specific activities clustered as a subscale in the original instrument might not be contextually valid among this specific population of Bosnian women. That

54 Brooks and others (n 14).
55 T Zoellner and A Maercker, 'Posttraumatic Growth in Clinical Psychology – A Critical Review and Introduction of a Two Component Model' (2006) 26 Clin Psychol Rev 626.
56 Kılıç, Magruder and Koryürek (n 16).
57 Verelst and others (n 11).

is to say, the coping strategies of one individual is by no means a guarantee that these are beneficial to another. Thus, we consider scores on the COPE subscales as indicators of application: a low score reflects little use of the specific collection of coping strategies, and a high score refers to a greater use of the specific coping strategies.

With regards to our sampling technique, limitations include a possible selection bias and not age matched participants. Equally, due to the small sample size, demographic associations were not corrected for in the SEM analyses and the power of the model is insufficient, which could have led to unstable goodness-of-fit estimates of the PTSD-PTG mechanism. However, we believe that this type of sampling in a post-war context such as that of Bosnia and Herzegovina – where stigma is still ever-present; where the effects of war are still daily realties for many people; where research in general is not part of the mainstream agenda (let alone that type which considers women survivors of CRSV); and where there is no information to access the entire population of survivors of CRSV – was currently our best option. Hopefully, the more that CRSV is discussed in mainstream society, and the more people feel comfortable to share their experiences, the greater options we will have to implement more sophisticated sampling techniques.

When reporting limitations, reference should also be made to how the results should be interpreted. Despite efforts to frame the study in relation to CRSV, a cross-sectional design in this context is not able to discount traumatic experiences that have taken place since the conflict and the impact these may have on the development of PTG or PTSD. In addition, the development of PTG requires a period of time, and thus, a cross-sectional study cannot rigorously demonstrate the dynamic process by which it is developed. Although the temporality of personal resources such as coping suggest a certain stability, we cannot know whether the development of PTG or PTSD would have changed over time. A longitudinal design can ultimately add weight to these findings and examine the dynamic development of relationships between coping and PTG in women who have experienced sexual violence in conflict.

Lastly, the concept of CRSV encompasses multiple types of abuse and victimisation, the minutiae of which were not addressed in this study. Women were asked about experiences of enslavement, but as one of only a few studies to consider this population, our focus remained on the wider common experience of rape and thus this was not controlled for in the analyses. Equally, it is known that human trafficking was rife during the conflict in BiH[58] but this was not specifically explored in this study. There is much room to address these aspects of CRSV in future research and whether the PTSD-PTG mechanism can be refined further with these in mind. Nonetheless, the results correspond

58 Haynes (n 12).

to existing literature, and begin to further explain some of the discrepancies in the understanding of PTG.

5. Conclusion and implications

This study has shown that PTG among CRSV survivors of Bosnia and Herzegovina's conflict during the 1990s is possible, particularly when utilising personal coping mechanisms to process the psychological sequalae. This finding has important implications for supporting women who experience CRSV, as the traditional bio-medical model of psychological treatment is inherently designed to identify and improve mental illness. Shifting toward a salutary perspective – one that is recovery-focused – opens up possibilities to utilise personal strengths and harness growth that may be applied in different settings. PTG in this study was not affected by severity of PTSD, which adds weight to the notion of a dual distress-growth mechanism. This is in line with Tedeschi and Calhoun, who state that 'PTG and distress are essentially separate dimensions, and growth experiences do not put an end to distress in trauma survivors'. [59]As such, an indirect association is identified that links high levels of disengagement to an increase in distress, which becomes a risk factor for lower measured PTG. Positive reinterpretation of events appears to be an important characteristic that independently predicts PTG across both sexual violence survivors and non-sexual violence war survivors. Harnessing this process during treatment could support the effectiveness of current interventions and promote recovery by accepting the various aspects of it. Specifically targeting the consequences of pathogenic and salutogenic outcomes following sexual trauma has the potential to leave a survivor not with less, but with more, more meaning, more purpose, more success and satisfaction with life.[60]

59 RG Tedeschi and LG Calhoun, 'Posttraumatic Growth: Conceptual Foundations and Empirical Evidence' (2004) 15 Psychol Inquiry 1, 13.
60 Anthony (n 26).