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Assessing the Latent Factor Association Between the Dysphoria Model of PTSD and Positive and Negative Affect in Trauma Victims from India

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Abstract The recent release of the DSM-5 comes with the division of posttraumatic stress disorder (PTSD) symptoms across four symptom clusters (American Psychiatric Association, 2013). This division is based on the support garnered by two four-factor models; Emotional Numbing (King et al., 1998) and Dysphoria (Simms et al., 2002) and a five-factor model; Dysphoric Arousal (Elhai et al., 2011). Much debate centered on the validity of the Dysphoria factor as a non-specific factor of PTSD within the Dysphoria model. In line with this, we assessed relations between the four factors of the Dysphoria model (Simms et al., 2002) and positive (PA) and negative affect (NA) in natural disaster victims (N=200) from Leh, India, using the PTSD checklist (PCL-S) and Positive and Negative Affect Schedule (PANAS short form). Confirmatory factor analysis was implemented to assess the best-fitting model for both the PCL (PTSD) and the PANAS (affect). Two optimal models (the Dysphoria model and a two-factor model for affect) were subsequently used to assess latent variable associations across constructs. It was hypothesized that differential associations between latent factors would be evident with the Dysphoria factor being highly correlated with negative affect compared to alternative PTSD factors. Significant correlations were found between factors of the Dysphoria model and NA (0.52–0.65, p<0.001). Comparing the association of pairs of PTSD factors with NA and PA, Wald's tests revealed that no single PTSD factor was more related to NA than the other. Avoidance and Hyperarousal factors were correlated with PA. Results are discussed in line with literature questioning Dysphoria factor's unique association with general distress.

Keywords Dysphoria · PTSD · Negative affect · Differential relation · India

Introduction

Posttraumatic stress disorder (PTSD) has clear conceptual and empirical ties with mood and other anxiety disorders, and much literature in recent times has highlighted this overlap based on the factor structure of PTSD (Elhai, Carvalho et al. 2011; Forbes et al. 2010; Grant, Beck, Marques, Palyo, & Clapp, 2008; Gros, Simms, & Acierno, 2010). However, most studies gauge the overlap between PTSD and other disorders via disorder-specific scales (e.g., depression scale) as a proxy for assessing the underlying common factor of negative affectivity or general distress. The current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013) has recently released a four-factor model of PTSD symptoms (reexperiencing, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity) after a plethora of empirically based literature questioned the tripartite model of PTSD as per DSM-IV-TR (APA, 2000) in

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favor of two four-factor models of PTSD and more recently also in support of a five-factor model of PTSD.

While the four-factor models of PTSD, namely the Emotional Numbing model (King, Leskin, King, & Weathers, 1998) and the Dysphoria model (Simms, Watson, & Doebbeling, 2002) have held the center-stage in the debate on the factor structure of PTSD, none was found to be distinctly superior to the other (reviewed in Elhai & Palmieri, 2011). One meta-analysis of 40 studies favored the Dysphoria model over the Emotional Numbing model, but only marginally so (cf. Yufik & Simms, 2010). The Emotional Numbing model emerged from the bifurcation of the DSM-IV-TR Avoidance/numbing factor of PTSD, and hence resulted in the factors of Reexperiencing (B1–B5), Avoidance (C1–C2), numbing (C3–C7), and Hyperarousal (D1–D5). On the other hand, the Dysphoria model merged the numbing factor with three items from Hyperarousal creating the Dysphoria factor (C3–C7 and D1–D3) or a general distress factor. The remaining three factors were Reexperiencing (B1–B5), Avoidance (C1–C2), and Hyperarousal (D4–D5). The general distress factor or Dysphoria is said to be the non-specific component of PTSD, and thus largely accounting for the overlap between PTSD and other disorders closely related to distress or negative affectivity (cf. Simms, Watson, & Doebbeling, 2002). More recently, Elhai et al. (2011) stated that the changes in the Dysphoria model, that is, the extraction of three symptoms from Hyperarousal and their addition to the symptoms of Emotional Numbing factor, to form the Dysphoria factor, does not clarify which of the two modifications resulted in superior fit for the model. This point, combined with an existing argument that items D1–D3 are conceptually different from the symptoms of Dysphoria and Hyperarousal (Shevlin et al., 2009; Watson 2005), led Elhai et al. (2011) to propose that the three items (D1–D3) which differ in their placement in the two four-factor models represent a separate and unique PTSD factor. Therefore, they proposed a model comprising five separate factors termed Reexperiencing (B1–B5), Avoidance (C1–C2), numbing (C3–C7), Dysphoric Arousal (D1–D3), and Anxious Arousal (D4–D5). The factor analytic support for the Dysphoric Arousal model has grown substantially and has been reported across victims from various countries, including China, the USA, Australia, Canada, Sri Lanka, and Denmark (Armour, Carragher, & Elhai, 2013; Armour, O'Connor, Elklit, & Elhai, 2013; Armour et al., 2012; Pietrzak et al., 2012; Semage et al., 2013; Wang et al. 2011). However, our focus in the present study is on the four-factor PTSD model of Dysphoria, given its notable Dysphoria factor, and its relation with positive and negative affectivity.

Contrasting results exist on the role of Dysphoria factor of the PTSD Dysphoria model being a non-specific or a general distress factor of PTSD (Simms et al. 2002), which is conceptually similar to negative affectivity. While some studies have documented the unique association of the Dysphoria factor (relative to other PTSD factors) with depression (Elhai, Contractor, Palmieri, Forbes, & Richardson, 2011; Elklit & Shevlin 2007; Palmieri, Weathers, Difede, & King, 2007; Simms et al. 2002) and emotional distress (Forbes et al. 2010), others failed to replicate these results (Elklit, Armour, & Shevlin, 2010; Forbes et al. 2012; Marshall, Schell, & Miles, 2010; Miller et al. 2010). For example, a longitudinal study based on two trauma samples from the USA found no evidence of Dysphoria symptoms being more highly related with general distress than the other PTSD symptoms (cf. Marshall, Schell, Miles, 2010). Similarly, Armour, McBride, Shevlin, and Adamson (2011) found that when controlling for Depression across PTSD items in a confirmatory factor analysis (CFA) model, the greatest attenuation in factor loadings was for the Reexperiencing factor rather than the Dysphoria factor. All together, these studies question the proposed role of the Dysphoria factor as the non-specific factor of PTSD. To our knowledge no study to date has gauged the relation between PTSD factors and the constructs of positive and negative affect.

Much of the literature on affective structure utilizes a 20-item self-reported measure known as the Positive and Negative Affect Schedule or PANAS (Watson, Clark, & Tellegen, 1988). The PANAS consists of 10 positive adjectives and 10 negative adjectives which the respondents rate according to the way they feel during a specified time (e.g., today, in general). Demonstrating the dimensions of affect as positive affect and negative affect, the developers argued that the two affective states were orthogonal in nature. Using the items from the original PANAS (Watson, Clark, & Tellegen, 1988), a short 10-item PANAS was developed on a sample of 804 older adults from the USA (Kercher 1992). The items of the short form of the PANAS were chosen on the basis of a circumplex model developed by Larsen and Diener (1992) to form two pure measures. CFA found further support for an orthogonal two-factor model including positive affect (PA) and negative affect (NA), with a correlation between two error terms (*scared* and *afraid* items). Further, Mackinnon and colleagues (1999) studied the factor structure of the short form of PANAS in a large Australian adult sample (N=2,651) across different age groups. A two-factor marginally intercorrelated model with two pairs of correlated residuals (*distressed* and *upset* items; *scared* and *afraid* items) was found to fit the overall data. With this in mind, for the present study, we decided to gauge the factor structure of PANAS (short form) based on an orthogonal two-factor model proposed by Kercher (1992) and the developers of the original test.

Prior literature establishes the relation between affective states of positivity or negativity and mental disorders like unipolar mood disorder and anxiety disorders (Watson, Clark, & Stasik, 2011; Watson, Clark, & Tellegen, 1988).

The positive association of negative affect with both depression and anxiety is attributable to it being a non-specific factor common to most emotional disorders (Mineka, Watson, & Clark, 1998; Watson, Clark, Stasik, 2011). The distinction however lies in the relation with PA which leads to more specificity and facilitates differential diagnosis. Studies suggest that anxiety disorders have no or a marginal relation with PA; however, low positive affectivity is associated with a diagnosis of depressive disorder (anhedonia; Mineka, Watson, & Clark, 1998; Watson, Clark, & Stasik, 2011; Watson, Clark, & Tellegen, 1988). But less is known about its relation with PTSD. A study assessing the relation between higher-order emotional states with PANAS-X (Watson & Clark 1994) and six DSM-IV disorders (APA, 1994), including PTSD, found that negative emotion scale was related with PTSD and other mood and anxiety disorders, and the positive emotion scale was not related with PTSD (Watson, Clark, & Stasik, 2011). Further, when considering the items of PANAS-X, all items on negative emotions predicted a diagnosis of PTSD; however, "attentiveness" (a factor loading on a higher-order factor of positive emotion) predicted a diagnosis of PTSD. Notably, the dimension of positive affect of the PANAS short form has two items (*alert* and *determined* items) subsumed under the construct "attentiveness" of the PANAS-X.

Against this background, the present study aimed to assess the association between the factors of PTSD and positive and negative affect using the PCL-S and PANAS short form, respectively, in a sample of victims of a natural disaster from Leh region, India. Specifically, we hypothesized first that negative affect would be significantly more related to the PTSD Dysphoria factor (C3–C7 and D1–D3) than to the other PTSD factors, given that the Dysphoria factor is the general distress (non-specific) factor of PTSD (cf. Simms et al., 2002). Second, we hypothesized that the association between each factor of PTSD Dysphoria model and positive affect would be marginal or non-significant as documented by prior studies on anxiety disorders (Mineka, Watson, & Clark, 1998; Watson, Clark, Stasik, 2011).

Method

Participants and Procedure

The purposive sample comprised of 200 participants who were directly affected by sudden heavy rainfall and devastating flash floods, mudslides, and debris flow as a result of a cloudburst over the Leh region (Ladakh, India) in August of 2010. Participants ranged in age from 19–76 years (M=34.75, SD=13.72). Just over half of the sample was female (57.5 %). Forty-nine percent of the participants were married, 49.5 % unmarried, 1 % divorced, and 0.5 % reportedly separated. Many resided in a joint family setup (58 %), while 42 % were members of a nuclear family. Most reported to be Buddhist (96 %) and 3.5 % report being Muslims when inquired about their religious affiliation. One (0.5 %) reported to have no affiliation with any religion. Most participants reported a loss of property in terms of damage to their house and/or farmland (48 %) and witnessing the flash floods (41.5 %). A proportion of participants also reported losing a loved one (8 %) or losing both a loved one and property (2.5 %) as a direct result of the disaster. All participants reported relocation to safe grounds (e.g., monastery on higher grounds) during the course of the disaster. No formal inquiry was made regarding the presence of fear, helplessness, or horror experienced by the participants' vis-à-vis the traumatic event (A2 criteria of DSM-IV PTSD). However, considering the nature of the disaster (sudden, unforeseen, and occurred past mid-night), displacement, and loss associated with it, a participant meeting the A2 criteria seems highly likely. Data were collected individually in the participant's residence with the assistance of a graduate student (LS; M.A. degree in Clinical Psychology). Nearly 14 % of participants needed assistance in filling out the questionnaire as their comprehension of English (also of Hindi and Urdu, the national and state language, respectively) was low. In such cases, the assessor (LS) verbally translated the measure to Ladakhi (the local language). However, no difference was found between the participants who needed assistance and those who would self-report without assistance on total scores on criteria B (t=0.45, p>0.05), criteria C (t=0.42, p>0.05), and criteria D (t=0.95, p>0.05) of DSM-IV-TR PTSD and PA (t=0.69, p>0.05) and NA (t=0.90, p>0.05). Participants in the diagnosable range of PTSD were asked to visit the nearest health center following a psychoeducation session delivered by the assessor. All assessments were carried out between February and June of 2011.

Measures

The Posttraumatic Stress Disorder Checklist-Specific (*PCL-S*; Weather, Litz, Herman, Huska, & Keane, 1993) is a 17-item self-reported instrument which corresponds to the 17 DSM-IV-TR (APA, 2000) symptoms of PTSD. Respondents rate each item using a five-point Likert scale ranging from 1 for '*not at all*' to 5 for '*extremely*'. For the current study, the respondents rated the presence of symptoms in the past 1 month corresponding to the event of facing the natural disaster. For the analyses of prevalence rates, firstly, the DSM-IV-TR (APA, 2000) symptom criteria for the presence of at least one item of Reexperiencing (criterion B), three items measuring avoidant/numbing (criterion C), and at least two items from Hyperarousal (criterion D), which were rated '*moderately*' *to* '*extremely*', were set. Secondly, we also used an overall cutoff score of 50 on PCL-S for assessing rates of PTSD and for the purpose of referral, as recommended by previous literature (Blanchard, Jones-

Alexander, Buckley, & Forneris, 1996; Forbes, Creamer, & Biddle, 2001). The PCL has been found to have good reliability and validity. Internal consistency of the 17 items within the PCL, in an Indian sample of sex workers, was found to be 0.89 (Suresh, Furr, & Srikrishnan, 2009). In addition, the PCL has shown to correlate moderate to high with the CAPS (r=0.93, Blanchard et al. 1996; r=0.30, Forbes et al. 2001). For the present study, Cronbach's α was 0.79, 0.78, 0.73, and 0.90 for the items of Reexperiencing, Avoidance/numbing, Hyperarousal, and total PTSD, respectively.

The Positive and Negative Affect Schedule Short Form (*PANAS short form*; Kercher 1992) is a 10-item self-reported questionnaire consisting of five positive adjective items (*excited*, *enthusiastic*, *alert*, *inspired*, *determined*) and five negative adjective items (*distressed*, *upset*, *scared*, *nervous*, *afraid*) representing two affective states, namely positive affect (PA) and negative affect (NA). It draws items from its 20-item predecessor (Watson, Clark, & Tellegen, 1988). Respondents are asked to rate the items according to the extent each described the way they have felt during a specified time, which for the present study was *past few weeks*. The response options are from *not at all* to *very much* (coded 1 through 5). Cronbach's alpha was found to be 0.78 for PA and 0.87 for NA, and little variation in internal consistency is found with increases in age (Mackinnon et al. 1999). In a study among the elderly from India, Cronbach's alpha for PA was 0.70 and for NA 0.82 (Gohil & Charak, 2013). In the present study, internal consistency was high for NA (α=0.82) and low for PA (α=0.56).

Analyses

Missing Data

Descriptive analysis was performed with IBM SPSS version 20.0 (IBM Corp., 2011). No missing data was recorded on any of the items. Assumptions of univariate (skewness/kurtosis values >1.35) and multivariate normality were not met; hence, we used maximum likelihood estimation with robust standard errors (MLR) for further analyses.

Specification and Estimation of Models

All analyses were performed using M*plus* 7.11 software (Muthén & Muthén, 2013). The analysis was conducted in three stages. First, we conducted confirmatory factor analysis (CFA) to specify and estimate the fit of the Dysphoria model of PTSD (Simms et al. 2002) to the data. We used maximum likelihood estimation with robust standard errors (MLR) in CFA which calculates the scaled chi-square statistic (*Y-B*χ^2; Yuan & Bentler 2000) and is robust to non-normality. When specifying the models, we fixed the first item in each latent factor to 1 in order to scale the factors. In addition, we allowed all factors to correlate and fixed error covariances to a value of zero.

Second, we conducted CFA to specify and estimate an orthogonal two-factor model of the PANAS: Positive Affect and Negative Affect. We used the same methodology as mentioned above, but factor correlation was constrained to zero. We first ran the model without any error covariances. Next, based on previous studies, we allowed an error covariance between one pair of items (*scared* and *afraid*; Kercher 1992; Mackinnon et al. 1999).

In the third step, we assessed a model encompassing the Dysphoria model from step 1 and the optimal PANAS model from step 2. This model entailed comparison of the association between the latent factors of the Dysphoria model and the NA and PA latent factors of our optimal PANAS model by computing Wald's chi-square (χ^2) tests of parameter constraints. The Wald test assesses the null hypothesis that the difference between two correlation paths is zero, using an alpha of 0.05. This allowed us to test the hypotheses that NA would be more strongly related with Dysphoria than with alternative PTSD factors.

Model Evaluation

We used robust versions of goodness-of-fit indices which included the comparative fit index (CFI), Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). As recommended by Hu and Bentler (1999), excellent (or adequate) fit of models is considered when CFI and TLI≥0.95 (0.90–0.94), RMSEA<0.06 (to 0.08), and SRMR<0.08 (to 0.1).

Results

The mean score of PTSD in PCL was 35.44 (SD=12.14), with mean subscale scores for Reexperiencing being 10.41 (SD=4.15), 4.49 (SD=2.13) for Avoidance, 15.47 (SD=5.90) for Dysphoria, and 5.08 (SD=2.15) for Hyperarousal. PTSD diagnostic criteria were met by 24.5 % of the participants after they endorsed one item of Reexperiencing, three items measuring avoidant/numbing, and at least two items from Hyperarousal. When a score of 50 on PCL-S was used as a cutoff, 12 % of the participants met the criteria for PTSD. On the PANAS, mean score was 11.52 (SD=4.46) for NA and 16.45 (SD=4.44) for PA.

Factor Structure of PTSD

The goodness-of-fit indices for the Emotional Numbing, Dysphoria, and Dysphoric Arousal models of PTSD are showed in Table 1. Comparing the two non-nested models (Emotional Numbing vs. Dysphoria) based on the difference between their BIC, no model had a better fit than the other (ΔBIC=2.5). For nested model comparisons, the corrected

Table 1 Goodness-of-fit indices for the models of Emotional Numbing, Dysphoria, and Dysphoric Arousal of PTSD

Models	χ^2	Y-B χ^2	*df*	CFI	TLI	SRMR	RMSEA (90 % CI)	BIC
Emotional Numbing	181.73	243.52	113	0.91	0.90	0.06	0.06 (0.04–0.07)	9844.33
Dysphoria	178.40	241.73	113	0.92	0.90	0.06	0.05 (0.04–0.07)	9841.83
Dysphoric Arousal	176.79	235.48	109	0.92	0.89	0.05	0.06 (0.04–0.07)	9856.74

Y-B χ^2 scaled Yuan-Bentler chi-square, *CFI* comparative fit index, *TLI* Tucker-Lewis index, *SRMR* standardized root mean square, *RMSEA* root mean square error of approximation, *CI* confidence interval, *BIC* Bayesian information criterion

scaled χ^2 difference test showed that no difference in fit was found between the Dysphoric Arousal model and the Emotional Numbing model [$\Delta\chi^2$ (4, N=200)=4.11, p>0.05] and the Dysphoric Arousal model and the Emotional Numbing model [$\Delta\chi^2$ (4, N=313)=8.80, p>0.05]. Hence, none of the three models emerged more parsimonious as compared to the other two models in the present study. Since in the present study our interest was to assess the differential association between the Dysphoria and other factors of the Dysphoria model, further analyses were conducted with this model. Standardized factor loadings and factor correlation of Dysphoria model of PTSD are shown in Table 2.

Factor Structure of PANAS

The goodness-of-fit indices for the two-factor PANAS model without a residual covariance were found to be adequate, *Y-B*χ^2 (34, N=200)=55.28, p<0.001, CFI=0.95, TLI=0.93, RMSEA=0.05 [90 % CI 0.02–0.08], SRMR=0.05. The goodness-of-fit indices for the two-factor model with a residual covariance were also found to be adequate, *Y-B*χ^2 (33, N=200)=45.66, p<0.001, CFI=0.97, TLI=0.96, RMSEA=0.04 [90 % CI 0.00–0.07], SRMR=0.05. Since the addition of error covariance leads to only a marginal increase in fit indices, we decided to retain the orthogonal two-factor model of PANAS without the error covariance.[1] Standardized factor loadings and factor correlation are shown in Table 3.

Latent Variable Associations Between Factors of the PTSD Dysphoria Model and the Two-Factor PANAS Model

A joint model including the PTSD Dysphoria model and the PANAS two-factor model indicated an adequate fit based on certain goodness-of-fit indices (e.g., RMSEA and SRMR), *Y-B* χ^2 ((308, N=200)=542.94, p<0.001, CFI=0.88, TLI=0.87, RMSEA=0.05 (90 % CI 0.04–0.06)), and SRMR=0.06. The CFI and TLI goodness-of-fit indices were not adequate. However, in the present model, the correlation between the factors of PTSD Dysphoria model and PA were expected to be low or marginal (and the correlations with NA were moderate in strength; see below); hence, it was expected that the CFI/TLI would be low (cf. Rigdon 1996). Furthermore, the aim of the present study was to assess the differential relations between the PTSD Dysphoria factors and PA and NA; and hence, we utilized the current model for the same.

Negative affect was significantly correlated with all four factors of the Dysphoria model (cf. Table 4). Wald tests indicated that the Dysphoria factor was not more strongly related with negative affectivity than the other factors of the Dysphoria model (cf. Table 4). On the other hand, positive affect was significantly related with Avoidance (r=0.27, p<0.05) and Hyperarousal (r=0.32, p<0.05), but failed to correlate with the Reexperiencing (r=0.08, p>0.05) and Dysphoria (r=0.03, p>0.05) factors of the Dysphoria model. Further, the analysis did not show any differential relation between Avoidance and Positive affect and hypersarousal and Positive affect (Wald χ^2=0.12, p>0.05).

Discussion

The present study is among the few studies in the PTSD literature which has gauged the relation between the factors of the Dysphoria model of PTSD and general distress (negative affect) directly and not via disorder-specific scales (e.g., depression) while simultaneously testing their relations with positive affect. Among the three competing PTSD models based on DSM-IV-TR, namely Emotional Numbing (King et al. 1998), Dysphoria (Simms et al. 2002), and Dysphoric Arousal (Elhai et al., 2011), no one model emerged better than the other two. However, all the three models had adequate goodness-of-fit indices and fit the data well.

Keeping in line with the aim of the present study, we assessed the relation between the factors of PTSD Dysphoria model and PA and NA. The current findings indicate that all the factors of the Dysphoria model were significantly

[1] As recommended we assessed for the PANAS model as a two-factor correlated model [Y-Bc^2 (34, N=200)=54.25, p<0.001, CFI=0.95, TLI=0.93, RMSEA=0.05 [90 % CI 0.02–0.08], SRMR=0.05], and found that PA and NA were not significantly associated with each other (r=−0.09, p>0.05). On comparing the fit indices of two-factor correlated model with the orthogonal two-factor model, no difference in fit indices was found. Since the orthogonal two-factor model is in line with literature demonstrating PA and NA being two pure dimensions (Kercher, 1992; Mackinnon et al., 1999; Watson, Clark, & Tellegen, 1988) we decided to retain it.

Table 2 Standardized Factor Loadings and Factor Correlation for the PTSD Dysphoria Model

Item	Reexperiencing	Avoidance	Dysphoria	Hyperarousal
B1. Intrusive thoughts	0.68			
B2. Nightmares	0.71			
B3. Flashbacks	0.62			
B4. Emotional reactivity	0.64			
B5. Physical reactivity	0.67			
C1. Avoidance of thoughts		0.68		
C2. Avoidance of reminders		0.71		
C3. Trauma-related amnesia			0.45	
C4. Loss of interest			0.61	
C5. Feeling detached			0.60	
C6. Feeling numb			0.54	
C7. Foreshortened future			0.66	
D1. Sleep disturbance			0.59	
D2. Irritability			0.60	
D3. Difficulty in concentration			0.63	
D4. Hyper-vigilance				0.61
D5. Exaggerated startle				0.68
Factor Correlations	Reexperiencing	Avoidance	Dysphoria	Hyperarousal
Avoidance	0.81	1		
Dysphoria	0.84	0.76	1	
Hyperarousal	0.77	0.74	0.85	1

All factor loadings and factor correlations are significant at $p<0.001$ level

correlated with negative affect. However, contrary to our first hypothesis, the association between negative affect and Dysphoria was not significantly different from the association between negative affect with the other factors in the PTSD Dysphoria model. This result suggests that the eight-item Dysphoria factor (C3–C7 and D1–D3) is not the only factor that accounts for the general distress in PTSD, as all other factors shared an equally strong association with negative affect. The current result adds to the existing literature that question the role of Dysphoria factor in solely accounting for the overlap between PTSD and other disorders. For example, after controlling for major depression, a study based on a nationally representative adult sample from the USA found a significant attenuation in factor loadings for all the factors of Dysphoria model. Similar results were found after control for generalized anxiety disorder, indicating that other symptoms besides Dysphoria were also related to distress (Armour et al., 2011). Furthermore, other studies which look more discretely at the relation between Dysphoria and general distress have also found that the Dysphoria factor and its items are no more correlated with general distress than are other PTSD factors (Marshall, Schell, & Miles, 2010; Miller et al., 2010).

Our hypothesis 2 was partially supported as factors of Reexperiencing and numbing were not correlated with positive affect. However, Avoidance and Hyperarousal were significantly and positively correlated with positive affect. This stands in contrast to previous literature which shows no correlation or a marginal negative correlation between positive affect and anxiety disorders (Mineka, Watson, & Clark, 1998; Watson, Clark, & Stasik, 2011). However, one reason that warrants future research may be the presence of adjectives in Positive affect which are similar to the symptoms of Hyperarousal (e.g., alert). A previous study assessing the relation between positive emotional states and anxiety disorders such as PTSD found that being higher on the dimension of attentiveness (with items such as alert, determined, concentrating, attentive) was associated with higher odds of being diagnosed with PTSD (Watson, Clark, & Stasik, 2011). A closer look at the bivariate correlations in the present study points out that the items of Avoidance and Hyperarousal are mainly associated with the two items of positive affect namely

Table 3 Standardized Factor Loadings for the Orthogonal Two-Factor Model of the PANAS

Item	PA	NA
Alert	0.36	
Determined	0.50	
Inspired	0.42	
Excited	0.50	
Enthusiastic	0.77	
Nervous		0.64
Scared		0.76
Afraid		0.84
Distressed		0.58
Upset		0.65

PA positive affect, *NA* negative affect

All factor loadings are significant at $p<0.001$ level

Table 4 Correlations between negative affect and the four factors of the PTSD dysphoria model and corresponding Wald test values

Path	*r* (*p* value)	Path	*r* (*p* value)	Wald χ^2 (*p* value)
NA with RE	0.65 (0.000)	NA with AV	0.52 (0.000)	2. 93 (0.09)
NA with RE	0.65 (0.000)	NA with DYS	0.63 (0.000)	0.08 (0.77)
NA with RE	0.65 (0.000)	NA with HYP	0.56 (0.000)	1.03 (0.31)
NA with AV	0.52 (0.000)	NA with DYS	0.63 (0.000)	1.87 (0.17)
NA with AV	0.52 (0.000)	NA with HYP	0.56 (0.000)	0.20 (0.65)
NA with DYS	0.63 (0.000)	NA with HYP	0.56 (0.000)	0.84 (0.36)

NA negative affect, *RE* Reexperiencing factor, *AV* Avoidance factor, *DYS* dysphoria factor, *HYP* Hyperarousal factor

alert and determined (cf. Table 5). Future studies should utilize the 20-item scale of PANAS or other measures of positive emotions (e.g., PANAS-X; Watson & Clark 1994) to assess the relation between the factors of PTSD with a larger spectrum of items of positive affectivity. The internal consistency of PA in the present study was also found to be low, and hence results need to be interpreted with caution.

Forensic implications for the present research are as follows. The present study adds to the existing literature that demonstrates that the Dysphoria factor of PTSD's Dysphoria model is no more related than the other PTSD factors to distress or disorders like depression. This may imply that a forensic evaluation which focuses primarily on the reexperiencing or intrusive components of PTSD as the driving force of psychopathology perhaps may be limited in its approach as the distress component is related to all the factors of PTSD. In other words, the overlap between PTSD and other disorders is not limited to Dysphoria factor but includes the other factors as well. This being said, it may make the task of differentiating between PTSD, PTSD/depression, and Depression only based on the Dysphoria factor of PTSD more complex. However, with the DSM-5 refining the already existing items of PTSD to be more specifically related to PTSD (e.g., recurrent distressing trauma-related dreams representing more here-and-now symptomology rather than the chronic ruminations) and the addition of three items may facilitate in distinguishing between the disorders aforementioned.

The present study should be interpreted with the following limitations in mind. First, the sample in the present study included victims who faced a natural disaster and thus generalizability to other populations (e.g., military personnel) is not known. Also, the sample was not large (N=200) and was not a representative sample as it did not represent victims from all the disaster-affected regions of Leh. It is important to mention here that while assessing the structural equation models in the present study, we did not face any issues with model identification. Second, the exclusive reliance on self-report for assessing PTSD and positive and negative affect is a methodological limitation. Third, the measures employed in the present study were not back-translated as the language employed during the administration of the tools was neither the national language (i.e., Hindi) nor the official state language (i.e., Urdu). Hence, the present study may be limited due to presence of method bias. Fourth, even though the participants were instructed to rate the PTSD symptoms with reference to a specific event (natural disaster), some

Table 5 Correlations between items of the PTSD Dysphoria model (PCL-S) and PANAS items

	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	C7	D1	D2	D3	D4	D5
NA1	*0.29*	*0.28*	*0.30*	*0.35*	*0.21*	0.15*	*0.18*	*0.30*	0.12	*0.22*	*0.22*	*0.26*	*0.19*	*0.21*	*0.34*	0.15*	*0.31*
NA2	*0.31*	*0.28*	*0.42*	*0.25*	*0.34*	*0.22*	*0.29*	*0.25*	0.14*	*0.27*	*0.30*	*0.31*	*0.25*	0.15*	*0.32*	*0.19*	*0.26*
NA3	*0.30*	*0.31*	*0.39*	*0.29*	*0.36*	*0.25*	*0.34*	*0.31*	*0.25*	*0.31*	*0.19*	*0.32*	*0.30*	0.17*	*0.38*	*0.20*	*0.33*
NA4	*0.27*	*0.18*	*0.34*	*0.22*	*0.29*	*0.25*	*0.22*	*0.30*	*0.20*	0.17*	*0.23*	*0.35*	*0.31*	0.16*	*0.27*	*0.24*	*0.31*
NA5	*0.39*	*0.26*	*0.37*	*0.32*	*0.32*	*0.30*	*0.24*	*0.29*	*0.32*	*0.33*	*0.31*	*0.37*	*0.33*	*0.22*	*0.35*	0.17*	*0.34*
PA1	0.10	0.12	0.01	0.07	−0.01	*0.18*	0.05	−0.13	0.08	0.001	−0.06	0.08	0.38	−0.05	−0.04	*0.35*	*0.18*
PA2	0.03	0.03	0.03	0.06	0.002	*0.18*	0.17*	−0.03	0.07	0.03	0.03	0.08	−0.09	−0.01	−0.04	*0.18*	0.12
PA3	0.01	−0.02	0.12	−0.11	0.08	−0.05	0.12	−0.03	0.001	0.07	−0.02	−0.03	0.04	0.02	0.05	0.01	0.04
PA4	0.02	0.04	0.06	−0.05	0.08	0.05	0.06	−0.07	0.09	0.003	−0.04	0.03	0.07	0.03	0.10	−0.04	0.11
PA5	0.05	0.03	0.06	−0.7	0.07	0.02	0.13	−0.17*	0.12	−0.002	0.01	−0.03	0.03	−0.01	0.06	0.10	0.07

NA negative affect; *PA* positive affect; *NA1-NA5* the items are nervous, scared, afraid, distress, and upset, respectively; *PA1-PA5* the items are alert, determined, inspired, excited, and enthusiastic, respectively; *B1-B5* items on Reexperiencing; *C1–C2* items on Avoidance; *C3–D3* items on Dysphoria; *D4-D5* items on Hyperarousal

All values in italic are significant at $p<0.01$ level

*$p<0.05$ level

participants may not have been able to do so considering that the reference points in itself had a number of potentially disturbing experiences, namely loss of a loved one, fear of dying, etc. The present study is limited in its inability to extract and separate the various kinds of traumatic experiences from the already specified trauma event.

Notwithstanding these limitations, we conclude that the present study, utilizing a novel sample (within the extant in PTSD literature), contributes to the debate over the role of the Dysphoria factor being a general distress factor in comparison to the other factors of the Dysphoria model. Notably, the DSM-5 model of PTSD (APA, 2013) is more similar to the Emotional Numbing model of PTSD (King et al., 1998)), and instead of a Dysphoria factor, the DSM-5 has items with similar content under the negative alterations in mood and cognitive factor (criteria D) and the negative alterations in arousal factor (criteria E). Hence, the present findings support the decision to retain the Dysphoria items in the DSM-5 PTSD symptoms (APA, 2013) as against some prior studies suggesting their removal on the pretext of representing a non-specific factor of PTSD. Future studies may want to examine the latent level relationship between alternative DSM-IV-TR and DSM-5 PTSD model conceptualizations.

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