Psychiatry Research 206 (2013) 26–32

Contents lists available at SciVerse ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

PTSD's latent structure in Malaysian tsunami victims: Assessing the newly proposed Dysphoric Arousal model

Cherie Armour [a,*], Siti Raudzah Ghazali [b], Ask Elklit [a]

[a] The National Centre for Psychotraumatology, University of Southern Denmark, Odense, Denmark
[b] Faculty of Medicine and Health Sciences, University Malaysia Sarawak, Malaysia

ARTICLE INFO

Article history:
Received 17 December 2011
Received in revised form
27 August 2012
Accepted 6 September 2012

Keywords:
PTSD
Confirmatory factor analysis
Five factor model
Dysphoric arousal
Anxious arousal
Tsunami
Natural disaster

ABSTRACT

The underlying latent structure of Posttraumatic Stress Disorder (PTSD) is widely researched. However, despite a plethora of factor analytic studies, no single model has consistently been shown as superior to alternative models. The two most often supported models are the Emotional Numbing and the Dysphoria models. However, a recently proposed five-factor Dysphoric Arousal model has been gathering support over and above existing models. Data for the current study were gathered from Malaysian Tsunami survivors ($N=250$). Three competing models (Emotional Numbing/Dysphoria/Dysphoric Arousal) were specified and estimated using Confirmatory Factor Analysis (CFA). The Dysphoria model provided superior fit to the data compared to the Emotional Numbing model. However, using chi-square difference tests, the Dysphoric Arousal model showed a superior fit compared to both the Emotional Numbing and Dysphoria models. In conclusion, the current results suggest that the Dysphoric Arousal model better represents PTSD's latent structure and that items measuring sleeping difficulties, irritability/anger and concentration difficulties form a separate, unique PTSD factor. These results are discussed in relation to the role of Hyperarousal in PTSD's on-going symptom maintenance and in relation to the DSM-5.

1. Introduction

Despite a plethora of factor analytic studies, spanning in excess of two decades of research, Posttraumatic Stress Disorder (PTSD)'s underlying dimensionality has yet to be finalised. A key finding within the extant factor analytic research is that the current tripartite model of Re-experiencing, Avoidance/Numbing and Hyperarousal, proposed by the Diagnostic and Statistical Manual (DSM-IV-TR: American Psychiatric Association [APA], 2000) is a poor reflection of PTSD's latent structure (cf. Asmundson et al., 2004). Further, two four-factor models termed the Emotional Numbing model (King et al., 1998) and the Dysphoria model (Simms et al., 2002) have received a wealth of factor analytic support. Indeed, support for these models has been provided across many trauma populations and assessment and measurement conditions (cf. Armour and Shevlin, 2010; Yufik and Simms, 2010). The latter is important given that factor analytic studies are essentially assessing the structure of PTSD instruments rather than the PTSD construct (Elhai and Palmieri, 2011). However, the structure of a PTSD measure is regarded as a good proxy or indicator of the PTSD construct given that the majority of PTSD measures map directly onto the 17 PTSD items of Criteria B, C, and D for PTSD in DSM-IV-TR (APA, 2000).

Most recently, a newly proposed five-factor model, termed the Dysphoric Arousal model (Elhai et al., 2011), has received empirical support over and above the Emotional Numbing and Dysphoria models. Given the pressing matter that the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA) is tentatively scheduled for publication in 2013, the identification of the correct PTSD symptom groupings is imperative. Specifically, the resultant symptom groupings are directly associated with diagnostic algorithms and thus PTSD prevalence rates (Elhai et al., 2009). Therefore, the current study investigates the latent structure of PTSD in a sample of Malaysian natural disaster survivors who were traumatised by directly experiencing a Tsunami.

The DSM-IV-TR (APA, 2000) tripartite model of PTSD operationalizes the 17 PTSD symptoms across Re-experiencing, Avoidance/Numbing, and Hyperarousal factors (cf. Table 1, Model 1). There has been limited empirical support for this model conceptualisation and the scant data supporting the model are questionable. For example, Cordova et al. (2000) specified, estimated, and supported the three-factor DSM-IV model with a second order PTSD factor. However, post-hoc modifications (deviating from the original model) were required to ensure that the model adequately fit the data.

* Correspondence to: The National Centre for Psychotraumatology, University of Southern Denmark, Campusvej 55, Odense, Denmark. Tel.: +45 44 07876142643.
E-mail address: armour.cherie@gmail.com (C. Armour).

0165-1781/$ - see front matter © 2012 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.psychres.2012.09.012

Table 1
Item distribution across PTSD models.

DSM-IV-TR symptom codes and descriptions	DSM-IV-TR Model 1	Numbing Model 2	Dysphoria Model 3	Dysphoric Arousal Model 4
B1: Intrusive thoughts	RE	RE	RE	RE
B2: Reoccurring dreams	RE	RE	RE	RE
B3: Reliving trauma	RE	RE	RE	RE
B4: Psychological reactivity	RE	RE	RE	RE
B5: Physiological reactivity	RE	RE	RE	RE
C1: Avoidance of thoughts	Av/N	Av	Av	Av
C2: Avoidance of reminders	Av/N	Av	Av	Av
C3: Memory impairment	Av/N	N	D	N
C4: Loss of interest	Av/N	N	D	N
C5: Feelings of detachment	Av/N	N	D	N
C6: Feelings of numbness	Av/N	N	D	N
C7: Hopelessness	Av/N	N	D	N
D1: Sleeping difficulties	H	H	D	DA
D2: Irritable/angry	H	H	D	DA
D3: Concentration difficulties	H	H	D	DA
D4: Overly alert	H	H	H	AA
D5: Easily startled	H	H	H	AA

Note: RE=Re-experiencing; Av=Avoidance; N=Numbing; H=Hyper-arousal; D=Dysphoria; DA=Dysphoric Arousal; AA=Anxious Arousal.

King et al. (1998) proposed a correlated, first-order, four-factor model, termed the Emotional Numbing model, which operationalized the 17 PTSD symptoms across Re-experiencing, Avoidance, Numbing and Hyperarousal factors (cf. Table 1, Model 2). This model retained the Re-experiencing and Hyperarousal factors of the DSM-IV-TR model. However, the Emotional Numbing model varied from the DSM-IV-TR model by splitting the Avoidance/Numbing factor into two distinct factors: Avoidance and Numbing. This distinction was based on evidence that both factors were differentially related to psychopathology and treatment outcome (reviewed in Asmundson et al., 2004). The Emotional Numbing model was first tested in a sample of 524 male veterans using an alternative models approach. Of all models tested, the Emotional Numbing model provided the best fit to the data. The Emotional Numbing model has since been extensively tested and supported across varying trauma populations, demographic variables (e.g., male and female), and assessment and measurement procedures (recently in Armour et al., 2011a,b,c; Elhai et al., 2010; Grubaugh et al., 2010; Morina et al., 2010).

Simms et al. (2002) proposed an alternative correlated, first order, four-factor model, termed the Dysphoria model. The Dysphoria model operationalized the 17 symptoms across four factors termed Re-experiencing, Avoidance, Dysphoria, and Hyperarousal (cf. Table 1, Model 3). Once again, consistent with the DSM-IV-TR and Emotional Numbing models, the Re-experiencing factor remained unchanged. The Avoidance factor was consistent with that of the Emotional Numbing model. However, three items (Sleeping difficulties, Irritability/Anger and Concentration difficulties) were removed from the Hyperarousal factor and placed with the Numbing items to create a Dysphoria factor. Thus, the Emotional Numbing and Dysphoria models vary only in their placement of three items (cf. Table 1, Models 2 and 3). The Dysphoria model was first tested in a sample of 3695, predominately male (91%) veterans, using an alternative models approach. It was based on the proposition that the symptoms in the Dysphoria factor reflected a general distress component of PTSD (Simms et al., 2002) and was supported over the Emotional Numbing model. To date the Dysphoria model, like the Emotional Numbing model, has received a wide array of empirical support across varying trauma populations, demographic variables (male and female), and assessment and measurement procedures (most recently in Armour et al., 2011a,b,c; Armour and Shevlin, 2010; Carragher et al., 2010; Engdahl et al., 2011; Meis et al., 2011). For comprehensive discussions of prior PTSD factor analytic studies, please consult Elhai and Palmieri (2011), Lancaster et al. (2009), and Yufik and Simms (2010).

Unfortunately, despite an immense number of PTSD factor analytic studies, neither the Emotional Numbing model nor the Dysphoria model has been deemed conclusively superior to preferential over the other, in part because both yield excellent fit indices (Yufik and Simms, 2010). Indeed, even when support is found for one model over the other, it is generally based on small differences in fit indices (cf. Armour and Shevlin, 2010). Moreover, while a recent meta-analytic study by Yufik and Simms (2010) showed mild support for the Dysphoria model, the authors explicitly stated that their study did not clear up the issue of model superiority, as not all PTSD studies were included and a different study set could have provided very different results.

Elhai et al. (2011) proposed a new alternative to the two existing evidence-based four-factor models: the Emotional Numbing model and the Dysphoria model. Their alternative model operationalized the 17 PTSD symptoms across five latent factors and was termed the Dysphoric Arousal model. The factors were termed Re-experiencing, Avoidance, Numbing, Dysphoric Arousal, and Anxious Arousal (Table 1, Model 4). Notably, the Re-experiencing, Avoidance, and Hyperarousal (renamed Anxious Arousal) factors were retained from the Dysphoria model. However, the Dysphoria factor was split into two factors termed Numbing (back to the numbing factor of the Emotional Numbing model) and Dysphoric Arousal. Elhai et al. (2011) highlighted that when Simms et al. (2002) proposed the Dysphoria model over the Emotional Numbing model they did so by making two changes: (1) they removed three items (Sleeping difficulties, Irritability/Anger and Concentration difficulties) from the Hyperarousal factor and (2) they combined these three items with the remaining Numbing items to create the Dysphoria factor. Elhai et al. (2011) proposed that perhaps they went a step too far by implementing these two changes simultaneously, ultimately suggesting that the three items may exist as an independent factor. Indeed, this proposal was not unsubstantiated given that Watson (2005) discussed that Dysphoric items such as Sleeping difficulties, Irritability/Anger and Concentration difficulties were substantially correlated with depression compared to non-dysphoric items, whereas items such as being overly alert and easily startled essentially tap anxious arousal which is characteristic of panic disorder. Elhai et al. (2011) went on to discuss that the items of sleeping difficulties, irritability/anger and concentration difficulties can therefore be differentiated from the remaining Hyperarousal (being overly alert and easily startled) items as the former items represent general distress rather than anxious arousal. Further, the items of sleeping difficulties, irritability/anger and concentration difficulties can also be differentiated from the numbing items (cf. Table 1) as the former items represent agitation and restlessness compared to a numbing of responsiveness.

The Dysphoric Arousal model was first tested and supported over and above the Emotional Numbing and Dysphoria models in a sample of 252 victims of domestic violence. Despite the fact that this model has only been recently proposed, it has gained a substantial level of factor analytic support. Indeed, Wang and colleagues have found support for the Dysphoric Arousal model over and above the Emotional Numbing and Dysphoria models using the PTSD checklist (PCL) in Chinese adolescent earthquake and riot victims (Wang et al., 2012; Wang et al., 2011a; Wang et al., 2011b; Wang et al., 2011c). Most recently, support for the