The Acute Stress Disorder Scale: a tool for predicting Post-traumatic Stress Disorder

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A major need in the psychological management of disaster victims is to identify those people who are at risk of long-term psychiatric disorder. The major disorder that develops following a disaster is posttraumatic stress disorder (PTSD). Although most people display PTSD symptoms in the initial weeks after a trauma, more than half of these people recover without any intervention in the following three months (Blanchard, Hickling, Barton, Taylor, Loos, & Jones-Alexander, 1996; Rothbaum, Foa, Rigs, Murdock and Walsh, 1992; Riggs, Rothbaum, & Foa, 1995). Accordingly, there is a demand for measures that assist us to identify those people who will not remit but have a long-term PTSD. It is argued that by early identification of people at risk of PTSD, we can offer treatments in the acute post-disaster phase and thereby prevent PTSD.

In an attempt to identify people at risk of developing PTSD, a new diagnosis of acute stress disorder (ASD) was introduced in DSM-IV (American Psychiatric Association, 1994). To meet criteria for ASD one must experience a stressor and respond with fear or helplessness (criterion A), have at least 3 of 5 dissociative symptoms (criterion B), at least one re-experiencing symptom (criterion C), marked avoidance (criterion D), and marked arousal (criterion E) (see Bryant and Harvey, 1997). Recent prospective studies have indicated that approximately 80% of trauma survivors who initially suffer ASD will meet criteria for PTSD 6 months later (Brewin, Andrews, Rose and Kirk, 1999; Bryant and Harvey, 1998; Harvey and Bryant, 1998) and 75% 2 years post-trauma (Harvey and Bryant, in press).

The introduction of this new diagnosis has raised the need for standardised instruments to measure ASD. The only measure that has been subjected to standard psychometric study is the Acute Stress Disorder Interview (ASDI; Bryant, Harvey, Dang & Sackville, 1998). The ASDI is a structured clinical interview that contains 19 dichotomously scored items that relate to DSM-IV criteria. It possesses sound test-retest reliability over a period of 2 to 7 days ($r = 0.95$), has good sensitivity (91%) and specificity (93%) compared to independent clinical diagnosis, and has been shown to successfully predict subsequent PTSD. The only self-report measure of ASD is the Stanford Acute Stress Reaction Questionnaire (SASRQ; Cardeña, Classen and Spiegel, 1991), which has been modified to a 30-item inventory that indexes ASD symptoms (see Stam, 1996). To date, however, there is no available data supporting its utility in identifying individuals who satisfy ASD diagnosis or who subsequently satisfy PTSD criteria.

Accordingly, the aim of this project was to develop a self-report measure that would predict subsequent PTSD. There is a significant need for a validated self-report measure of ASD because structured clinical interviews are often not feasible in the aftermath of large-scale disasters. Self-report measures that permit identification of those acutely traumatised individuals who are at risk of chronic PTSD would provide opportunities for early intervention of people at risk. In developing a self-report measure of ASD, we recognise a number of difficulties. First, the diagnostic criteria of ASD have not been adequately validated (Bryant and Harvey, 1997). Most problematic for the ASD diagnosis is the finding that many acutely traumatised people who do not display dissociative symptoms subsequently develop PTSD (Harvey and Bryant, 1998). Second, the reactive and acute nature of ASD may predispose it to a fluctuating course that may impede accurate and reliable measurement. Third, the ASD criteria permit dissociative symptoms that may occur at the time of the trauma or at any time during the month after the trauma. Retrospective reporting of ASD symptoms has been demonstrated to be inaccurate (Harvey and Bryant, 1999). Considering the limitations of the ASD criteria, the development of this measure recognised the need to identify ASD caseness but also to index the acute precursors of PTSD that may go beyond the current definition of ASD. This paper presents the results of three studies that evaluated the content and concurrent validity, reliability, and predictive ability of the Acute Stress Disorder Scale (ASDS).

Method

Participants

Eighty-two (32 male, 50 female) adults of mean age 39.91 years ($SD = 15.93$) participated in this study. These participants represented 77% of the 107 participants who initially completed the ASDS in Study 2. Participants did not differ from non-participants in terms of age, initial trauma-assessment interval, ASD diagnostic status, or ASDS total score. Six (7%) participants had received formal counselling as a result of the fires.

Procedure

Participants were contacted between six and seven months after the bushfires ($M = 6.32$, $SD = .31$). Each participant was informed that a follow-up assessment was being conducted to evaluate longer-term adjustment to the fires. All assessments were conducted by one of 4 clinical psychologists who were unaware of participants' scores on the ASDS. PTSD was assessed with the Clinician Administered PTSD Scale, Form 2 (CAPS-2; Blake, Weathers, Nagy, Kaloupek, Gusman, Charney and Keane, 1995). The CAPS-2 assesses frequency and severity of each PTSD symptom in the context of the last week, and possesses sound test-retest reliability and strong convergent validity with standard measures of PTSD. Participants were also asked about any therapeutic assistance they had received following the fires.

Results

Eleven (13%) of the sample met criteria for PTSD at 6-months post-trauma. *Table 2* presents the correlation coefficients between the ASDS and CAPS-2 scale scores. The correlation between ASDS scores and PTSD cluster scores was significantly positive for all ASDS cluster scales. The main aim of this study was to determine the extent to which ASDS scores could predict subsequent PTSD. We initially determined predictive ability of an initial ASD diagnosis, based on the ASDS cut-off formula described in Study 1. On the basis of this calculation, 90% of those who developed PTSD were initially diagnosed with ASD, and 80% of those who did not develop PTSD did not present with ASD. Less impressively, false positive diagnoses (individuals who

were diagnosed with ASD but did not develop PTSD) occurred in 58% of cases. False negative diagnoses (individuals who were not diagnosed with ASD who did develop PTSD) was only 2%.

We attempted to increase the effectiveness of the predictive ability of the ASDS by reducing the rate of false positive diagnoses. On the basis of previous findings that acute stress severity can be a more accurate predictor of PTSD than the requirement of acute dissociation (Brewin *et al*, in press; Harvey and Bryant, in press), we investigated the sensitivity and specificity of ASDS total scores in predicting PTSD. *Table 2* presents the sensitivity, specificity, predictive values, and effectiveness of the ASDS for five alternative cut-off scores. The optimal cut-off score was 56, which identified 91% of those who developed PTSD and 93% of those who did not. The main flaw with this cut-of was that it falsely identified 33% of people who did not develop PTSD.

Discussion

The ASDS was developed to provide a self-report measure of acute stress reactions that are precursors of PTSD. There was limited success in predicting PTSD. Although the ASDS cut-off of 56 correctly identified 91% of people who developed PTSD and 93% of those who did not develop PTSD, one-third of participants who scored over the cut-off did not develop PTSD. That is, whereas the ASDS was able to identify virtually all trauma survivors who subsequently developed PTSD, it did not filter these individuals out from a significant proportion who did not develop PTSD. Prospective studies indicate that more than half of people who initially display PTSD symptoms after a trauma recover without any formal intervention (Blanchard *et al,* 1996; Rothbaum *et al*, 1992; Riggs *et al*, 1995). In the light of these findings, the ASDS performed comparatively well because only one-third of people who scored above the cut-off did not meet criteria for PTSD 6 months later. It appears that the ASDS may serve a useful purpose as a self-report instrument to identify those people who are at risk of developing PTSD. The results of the ASDS should be supplemented, however, by clinician assessments to more accurately identify acutely traumatised individuals who are at risk of developing PTSD.

It is interesting to compare the ability of the ASDI and ASDS to predict PTSD 6-months post-trauma. The reported sensitivity and specificity of the ASDI is over 90% (Bryant and Harvey, 1998; Harvey and Bryant, 1998), which is comparable to the current findings with the ASDS. The rate of false positive identifications of the ASDI has

Acute Stress Disorder Scale					
	Total	Dissociation	Re-experiencing	Avoidance	Arousal
CAPS-2					
Total					
Frequency	.65	.37	.71	.96	.67
Intensity	.66	.42	.72	.44	.66
Re-experiencing					
Frequency	.63	.36	.72	.40	.64
Intensity	.68	.44	.75	.47	.66
Avoidance					
Frequency	.62	.39	.65	.45	.62
Intensity	.65	.42	.68	.45	.64
Arousal					
Frequency	.62	.33	.68	.41	.66
Intensity	.61	.37	.67	.38	.62
Note: All correlation coefficients p < .001. CAPS-2 = Clinician Administered PTSD Scale, Form 2.					

Table 1: Correlation coefficients of Acute Stress Disorder Scale scores and CAPS-2 scores

ASDS Score	Sensitivity	Specificity	PPP	NPP	Efficiency
50	.83	.86	.50	.97	.85
52	.91	.86	.50	.98	.86
54	.91	.89	.56	.98	.89
56	.91	.93	.67	.98	.93
58	.55	.93	.55	.93	.89
Note: PPP = positive predictive power, NPP = negative predictive power.					

Table 2: Predictive values of ASDS scores for identifying subsequent PTSD

been between 18% and 22%, compared to the current rate of 56% when the ASD diagnostic cut-off is adopted, and 33% when the ASDS total score cut-off is adopted. That is, the structured interview was more effective than the ASDS is filtering out those acutely distressed individuals who did not subsequently suffer persistent PTSD. This pattern is consistent with proposals that structured interviews are more effective tools than self-report measures, and suggests that self-report measures of acute stress reactions should be interpreted cautiously.

Future research with the ASDS should index its ability to predict PTSD across a range of trauma populations. It is possible that developing a self-report measure that identifies acutely traumatised people whose symptoms will not remit will remain a difficult task because of the tendency for most people to recover in the months after a trauma. Early treatment of trauma survivors with ASD can effectively prevent PTSD in many cases (Bryant, Harvey, Sackville, Dang and Basten, 1998). Accordingly, development of screening instruments that facilitate identification of people who will develop PTSD can have significant implications for managing traumatised populations.

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