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Post-traumatic stress disorder: findings from the Australian National Survey of Mental Health and Well-being

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ABSTRACT

Background. We report on the epidemiology of post-traumatic stress disorder (PTSD) in the Australian community, including information on lifetime exposure to trauma, 12-month prevalence of PTSD, sociodemographic correlates and co-morbidity.

Methods. Data were obtained from a stratified sample of 10641 participants as part of the Australian National Survey of Mental Health and Well-being. A modified version of the Composite International Diagnostic Interview was used to determine the presence of PTSD, as well as other DSM-IV anxiety, affective and substance use disorders.

Results. The estimated 12-month prevalence of PTSD was 1.33%, which is considerably lower than that found in comparable North American studies. Although females were at greater risk than males within the subsample of those who had experienced trauma, the large gender differences noted in some recent epidemiological research were not replicated. Prevalence was elevated among the never married and previously married respondents, and was lower among those aged over 55. For both men and women, rape and sexual molestation were the traumatic events most likely to be associated with PTSD. A high level of Axis I co-morbidity was found among those persons with PTSD

Conclusions. PTSD is a highly prevalent disorder in the Australian community and is routinely associated with high rates of anxiety, depression and substance disorders. Future research is needed to investigate rates among other populations outside the North American continent.

INTRODUCTION

Post-traumatic stress disorder (PTSD) has been the focus of considerable attention since it was first included in the diagnostic nomenclature in 1980 with the advent of DSM-III (American Psychiatric Association, 1980). The diagnostic criteria were refined in subsequent editions, with DSM-IV (American Psychiatric Association, 1994) providing the most recent version. Not surprisingly, the first criterion to be met for a diagnosis is experience of a traumatic event. Criterion A specifies that the event must involve

actual or threatened physical threat to the self or others, as well as a requirement that the person's response involved intense fear, helplessness, or horror. The B group of criteria relates to re-experiencing the trauma (such as intrusive memories, nightmares and distress on exposure to reminders). The C group of criteria refers to active avoidance of reminders, as well as a numbing of general responsiveness, while the D criteria require symptoms of hyperarousal such as anger, sleep disturbance and hypervigilance. The symptoms in B, C and D must be present for at least 1 month before a diagnosis can be made.

Several epidemiological studies in recent years have provided information regarding the prevalence of PTSD, the association between specific

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traumatic experiences and the development of PTSD, demographic correlates and comorbidity of other disorders with PTSD. The largest and most influential of those studies was the National Comorbidity Survey (NCS) conducted by Kessler and his colleagues (1995). The purpose of this paper is to present comparable findings for the Australian population collected as part of the National Survey of Mental Health and Wellbeing in 1997. In the context of comparisons with the American NCS study, however, an important caveat should be made from the outset. The NCS data discussed by Kessler *et al.* (1995) reported on the lifetime prevalence of PTSD, while the current study reports on the presence of a PTSD diagnosis in the last 12 months. This difference between the two studies limits several areas of potential comparison.

Experience of a traumatic event is surprisingly common, with estimates in the general community ranging from 51% of women and 61% of men (Kessler *et al.* 1995) to as high as 84% (Vrana & Lauterbach, 1994). Thankfully, by no means all of those people who experience trauma will go on to develop PTSD. The exact prevalence of the disorder in the community, however, remains a matter of some debate. Findings across studies are often hard to compare owing to different methodologies, the use of different diagnostic criteria, and the fact that some studies report lifetime rates while others report current rates of the disorder. Some earlier studies, such as the Epidemiologic Catchment Area (ECA) Program, found relatively low lifetime prevalence rates (based on DSM-III criteria) of between 1.0% and 1.3% (Helzer *et al.* 1987; Davidson *et al.* 1991). Later research using DSM-III-R criteria has generally reported higher rates of lifetime prevalence. Breslau and colleagues, for example, in a study of young adults from Detroit, found that 11% of women (31% of those exposed to trauma) and 6% of men (14% of those exposed to trauma) had a lifetime history of PTSD (Breslau *et al.* 1991). Similarly, in a national telephone survey of women, 12% of respondents (18% of those exposed to trauma) were found to have a lifetime diagnosis of PTSD (Resnick *et al.* 1993). The NCS (Kessler *et al.* 1995) found a PTSD lifetime prevalence of 7.8% in the total sample, with the rate for women being twice that of men (10.4%

v. 5%). One of the few studies to adopt the more recent DSM-IV criteria found a current prevalence of 2.7% for women and 1.2% for men among a Canadian community sample (Stein *et al.* 1997). In a German community sample of young people (aged 14 to 24), Perkonig *et al.* (2000), also using DSM-IV criteria, found relatively low current rates of 1% for males and 2.2% for females.

The probability of developing PTSD is dependent upon, among other things, the nature of the traumatic experience. The NCS (Kessler *et al.* 1995) reported a consistently high prevalence of PTSD among rape victims. Approximately 65% of men who had been raped and 46% of women, qualified for a diagnosis of PTSD at some stage in their lives. Other high risk categories of experience were combat or physical abuse for men (39% and 22% respectively) and physical abuse or being threatened with a weapon for women (49% and 33% respectively). Similarly, the Detroit Area Survey of Trauma (Breslau *et al.* 1998) found that the highest risk of PTSD was associated with violent assault (which included rape).

Co-morbidity in PTSD is the norm rather than the exception. It has been reported, for example, that 99% of Vietnam veterans with chronic PTSD had, at some stage, qualified for another DSM-III-R diagnosis, compared with 41% of those without PTSD (Kulka *et al.* 1990). The most prevalent co-morbid disorders in that study were substance abuse or dependence (75%), generalized anxiety disorder (44%) and major depression (20%). Similarly, Breslau *et al.* (1991) found that 83% of her non-veteran PTSD sample met criteria for at least one other psychiatric disorder compared with 44% of those without PTSD. The most common conditions were substance abuse or dependence (43%), major depression (37%) and agoraphobia (22%). The NCS (Kessler *et al.* 1995) reported that 88% of men and 79% of women with chronic PTSD met criteria for at least one other psychiatric diagnosis. Odds ratios in that study showed a consistently significant relationship between lifetime PTSD and a range of other affective, anxiety, and substance use disorders in both men and women.

In terms of demographic variables, gender is a commonly found risk factor in the development of PTSD, with females being more vulnerable

(Kessler *et al.* 1995; Stein *et al.* 1997, 2000; Breslau *et al.* 1999). Both Breslau *et al.* (1999) and Stein *et al.* (2000) suggest that this may be due, in part, to females' greater risk following assaultive violence. While research on other demographic factors is less convincing, there is some evidence to suggest that previously married (separated, divorced, or widowed) men and women are at greater risk than those who are currently married. Kessler *et al.* (1995) also found evidence of increasing PTSD prevalence with increasing age among men but not women.

METHOD

Sample

The data come from the National Survey of Mental Health and Wellbeing (NSMHWB) conducted by the Australian Bureau of Statistics (1998) in 1997. A total of 13 624 Australian households were selected and the adult with the next birthday from each household was invited to participate. If he or she declined, no further recruitment of that household was attempted. This yielded 10 641 participants (representing a 78% response rate). The age and sex characteristics of the sample were weighted to match the age and sex distribution in the national census. The authors received data on a Confidential Unit Record File (CURF: Australian Bureau of Statistics, 2000). Further details of the survey are provided by Andrews *et al.* (2001).

Diagnostic assessment

The diagnostic interview in the NSMHWB was a modified version of the Composite International Diagnostic Interview (CIDI) (Andrews & Peters, 1998), comparable to that used in the NCS in America (Kessler *et al.* 1994). In addition to PTSD, the CIDI was used to determine the presence of five other DSM-IV anxiety disorders (generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, agoraphobia, social phobia), three affective disorders (major depression, dysthymia, bipolar disorder) and four substance use disorders (alcohol abuse and dependence, drug abuse and dependence). Interviews were administered from a laptop computer by trained lay interviewers (Andrews *et al.* 2001). On the basis of the CIDI, each disorder was rated as present or absent for the purpose of this study.

1. Direct combat experience in a war
2. Life-threatening accident
3. Fire, flood or natural disaster
4. Witnessed someone being badly injured or killed
5. Raped, that is, someone had sexual intercourse with you when you did not want to, by threatening you, or using some degree of force
6. Sexually molestation, that is, someone touched or felt your genitals when you did not want them to
7. Serious physical attack or assault
8. Threatened with a weapon, held captive, or kidnapped
9. Torture or terrorism
10. Any other extremely stressful or upsetting event
11. A great shock because one of the events on the list happened to someone close to you

FIG. 1. List of events qualifying as traumas under DSM-IV.

The PTSD module of the CIDI (Peters *et al.* 1996) began by asking about 'extremely stressful or upsetting events that sometimes occur to people' and the interviewee was handed a card on which was printed nine questions about events and experiences that qualify as traumas in DSM-IV (Fig. 1). This card was similar to that used by Kessler *et al.* (1995) with the exception that questions on childhood abuse and neglect were not included in the current study and 'torture or terrorism' was added. (Responses to the latter question were negligible and were combined with 'threatened with a weapon, held captive, or kidnapped' for subsequent analyses.) A tenth question was open-ended, asking about 'any other extremely stressful or upsetting event'. Respondents were then asked 'have you suffered great shock because one of the events on the list happened to someone close to you?'. If the response was yes, a description of the event was obtained. Responses to this question, as well as to question 10, were coded by interviewers according to guidelines incorporated in the PTSD module according to whether they qualified under Criterion A1. Non-qualifying events were excluded. Respondents nominating more than one event were asked 'which was the most stressful or upsetting?'. The remainder of the PTSD module (including criteria A2 and F) was then administered with reference to that event, enquiring about symptoms experienced 'in the

past 12 months', to determine the presence of a PTSD diagnosis.

Analysis procedures

In general, data analysis procedures followed the strategies adopted by Kessler *et al.* (1995). The statistical technique of jack-knife replicate weighting provided for estimation of all statistics taking into account the design error arising from the clustered probability sampling methodology. Statistical analyses were carried out with SUDAAN (Version 7.5.3).

RESULTS

Prevalence of trauma exposure and PTSD

Estimates of lifetime prevalence of trauma exposure are presented in Table 1 separately for men and women – 64.6% of men and 49.5% of women reported at least one traumatic event. In line with other research, most people who reported some type of lifetime trauma actually experienced more than one event. Of the men who reported at least one trauma, 38% had experienced only one, 28% experienced two, 16% experienced three, and 18% had experienced four or more traumatic events. Of the women who reported at least one trauma, 52% had experienced only one, 24% had experienced

two, 13% three and 12% had experienced more than three traumatic events.

The types of trauma experienced by the largest proportions of people were witnessing someone being badly injured or killed (37.8% of men and 16.1% of women), being involved in a life threatening accident (28.3% of men and 13.6% of women), and being involved in a natural disaster (19.9% of men and 12.7% of women). A significantly higher proportion of men than women reported experiencing each of these three events, as well as being physically attacked, threatened with a weapon, and combat experience. Conversely, a significantly higher proportion of women than men reported experiencing rape and sexual molestation. Combining these two categories (taking account of those who had experienced both), a total of 12.9% of women had experienced sexual molestation or rape, compared with only 3.8% of men.

The estimated 12-month prevalence of DSM-IV PTSD in the total sample was 1.33% (S.E. = 0.12), representing an estimated 179 093 cases across Australia. This is considerably lower than the 12-month prevalence of 3.9% (S.E. = 0.4) reported in the American NCS data (Kessler *et al.* 1999*a*). Contrary to the findings of previous research from North America, there was little evidence of a higher PTSD prevalence among

Table 1. Lifetime prevalence of traumatic experience

Trauma	Lifetime prevalence of trauma					
	Men (N = 4705)			Women (N = 5936)		
	%	(S.E.)	No.	%	(S.E.)	No.
Rape	0.6*	(0.1)	33	5.4	(0.3)	374
Molestation	3.5*	(0.3)	178	10.2	(0.4)	656
Physical attack	12.9*	(0.6)	636	7.6	(0.5)	528
Combat	6.1*	(0.4)	309	0.9	(0.1)	57
Shock	9.8	(0.5)	454	12.0	(0.6)	692
Life threatening accident	28.3*	(0.6)	1395	13.6	(0.4)	822
Natural disaster	19.9*	(0.6)	987	12.7	(0.5)	807
Witness	37.8*	(0.8)	1805	16.1	(0.6)	971
Threat with weapon	16.5*	(0.7)	811	7.0	(0.3)	482
Other	8.2	(0.5)	371	8.3	(0.5)	501
Any trauma	64.5*	(0.9)	3080	49.5	(0.8)	3024
No. of traumas						
1	24.8	(0.7)	1156	26.3	(0.7)	1559
2	18.3*	(0.5)	866	11.8	(0.5)	723
3	10.2*	(0.5)	504	6.2	(0.4)	388
4	6.5*	(0.3)	308	2.9	(0.2)	187
> 4	4.7*	(0.4)	246	2.4	(0.2)	167

* Sex difference significant at the 0.05 level, two-tailed test.

Table 2. Proportions of specific traumas being nominated as the PTSD index event (P1) and, once selected, being associated with PTSD in the past 12 months (P2)

Trauma	Men						Women					
	P1	(S.E.)	N	P2	(S.E.)	N	P1	(S.E.)	N	P2	(S.E.)	N
Rape	55.5	(8.9)	18	8.4	(6.6)	2	50.5	(3.1)	192	9.2	(2.2)	22
Molestation	32.5*	(4.0)	59	11.8	(4.6)	8	47.6	(1.9)	297	5.5	(1.5)	15
Physical attack	33.4*	(2.1)	196	2.4	(1.5)	5	46.0	(2.4)	240	3.7	(1.7)	9
Combat	46.9	(2.8)	140	4.7*	(1.7)	7	57.5	(7.2)	32	—	—	0
Shock	58.9	(3.0)	263	2.0	(1.0)	5	64.1	(2.3)	443	1.7	(0.5)	14
Life threatening accident	48.0	(1.2)	657	1.5	(0.6)	8	54.2	(2.5)	427	1.7	(0.8)	7
Natural disaster	32.3*	(1.8)	310	0.3	(0.4)	1	49.4	(2.0)	390	1.3	(0.7)	3
Witness	55.2	(1.0)	991	1.0	(0.4)	10	54.9	(1.6)	514	1.1	(0.6)	5
Threat with weapon	31.4*	(1.8)	262	1.9	(0.9)	5	43.3	(3.0)	205	4.2	(1.3)	9
Other	49.2	(3.4)	184	5.0	(1.7)	11	57.1	(3.2)	284	4.5	(1.6)	12
Any trauma				1.9*	(0.3)	62				2.9	(0.2)	96

* Sex difference significant at the 0.05 level, two-tailed test.

women. PTSD prevalence was 1.2% (S.E. = 0.2) for males in the current sample and 1.4% (S.E. = 0.1) for females.

Differences across traumas in probability of PTSD

Participants were assessed for PTSD on the basis of either their only trauma or, in people reporting more than one event, their 'most upsetting' trauma. Table 2 shows the proportion of respondents nominating a specific trauma as the basis for assessment of PTSD (P1). That is, P1 in Table 2 indicates the proportion nominating that particular trauma type as their only, or most upsetting, trauma. Considerable variation exists across trauma types in the likelihood of that event being nominated as the only, or most upsetting, event. As noted by Kessler *et al.* (1995), this variation is explained by a complex interaction between differences in the distribution of multiple traumas and the fact that some trauma types are more upsetting than others. Somewhat surprisingly, the trauma with the highest likelihood of being the index event for both men and women was having 'suffered a great shock because one of the events on the list happened to someone close to you'. Significant gender differences were apparent for molestation, physical attack, natural disaster, and threat with a weapon, with women being more likely than men to nominate these events as their only or most upsetting traumatic experience.

The columns labelled P2 in Table 2 indicate the proportion of respondents with each par-

ticular index trauma who met criteria for PTSD over the past 12 months. Again, considerable variation across trauma type is evident in the extent to which specific events are associated with a PTSD diagnosis in the last 12 months. For both men and women, rape and sexual molestation were the traumatic events most likely to be associated with PTSD. The lowest likelihood of PTSD over the past 12 months was associated with natural disasters in men, and (excluding combat) witnessing someone being badly injured or killed in women.

Distribution of most upsetting traumas among people with PTSD

Table 3 shows the percentage of each index trauma type in the subsample of respondents with a diagnosis of PTSD in the last 12 months. Of the men with PTSD, the traumas most likely to be associated with the diagnosis were the 'other' category (16.4%), witnessing someone being badly injured or killed (16.3%) and life threatening accident (16.0%). For women with PTSD, the index traumas were most likely to be sexual molestation (18.6%), rape (17.8%), and the 'other' category (15.0%). The apparent discrepancy in terms of percentages (for example, 22 rape victims equalling 17.8% and 15 molestation victims equalling 18.6%), though counter-intuitive, is a function of the sample weightings. In effect, some of those persons reporting rape have an overall lower weighting than some of those reporting molestation.

Table 3. Those with post-traumatic stress disorder (PTSD) reporting each most upsetting trauma type

Trauma	Men (N = 62)			Women (N = 96)		
	%	(S.E.)	No.	%	(S.E.)	No.
Rape	2.3*	(1.6)	2	17.8	(4.3)	22
Molestation	11.0	(4.6)	8	18.6	(5.0)	15
Physical attack	8.4	(5.0)	5	9.0	(4.2)	9
Combat	10.8*	(4.0)	7	0.0	(0.0)	0
Shock	9.2	(4.7)	5	9.4	(2.7)	14
Life threatening accident	16.0	(6.4)	8	8.7	(4.2)	7
Natural disaster	1.8	(1.8)	1	5.8	(3.0)	3
Witness	16.3	(5.5)	10	7.0	(3.6)	5
Torture/terrorized	7.9	(3.9)	5	8.9	(3.0)	9
Other	16.4	(5.1)	11	15.0	(4.8)	12
Any trauma	100.0	(—)	62	100.0	(—)	96

* Sex difference significant at the 0.05 level, two-tailed test.

Table 4. Sociodemographic correlates of 12-month post-traumatic stress disorder (PTSD)

	OR (95% CI)			
	Model 1: Risk of trauma	Model 2: Risk of PTSD	Model 3: Risk of PTSD in trauma subsample	Model 4: PTSD risk in trauma subsample controlling for trauma type
Gender				
Female	0.53 (0.5-0.6)	1.12 (0.8-1.6)	1.41 (1.0-2.0)	1.02 (0.7-1.5)
Male	1.00 (1.0-1.0)	1.00 (1.0-1.0)	1.00 (1.0-1.0)	1.00 (1.0-1.0)
Age				
≥ 55	1.12 (1.0-1.3)	0.21 (0.1-0.6)	0.21 (0.1-0.6)	0.18 (0.1-0.6)
45-54	1.44 (1.2-1.7)	0.86 (0.4-1.8)	0.73 (0.4-1.5)	0.72 (0.3-1.5)
35-44	1.31 (1.1-1.6)	0.85 (0.4-1.7)	0.73 (0.4-1.4)	0.69 (0.4-1.4)
25-34	1.25 (1.1-1.5)	1.04 (0.6-1.9)	0.94 (0.5-1.7)	0.91 (0.5-1.7)
18-24	1.00 (1.0-1.0)	1.00 (1.0-1.0)	1.00 (1.0-1.0)	1.00 (1.0-1.0)
Marital status				
Never married	1.00 (0.9-1.2)	1.65 (1.0-2.6)	1.62 (1.0-2.6)	1.56 (1.0-2.4)
Previously married	1.27 (1.1-1.5)	2.91 (1.7-5.1)	2.49 (1.4-4.4)	2.30 (1.3-4.1)
Married	1.00 (1.0-1.0)	1.00 (1.0-1.0)	1.00 (1.0-1.0)	1.00 (1.0-1.0)

Demographic correlates of PTSD

In order to investigate sociodemographic correlates of a 12-month PTSD diagnosis, multiple logistic regression analyses were conducted using sex, age, marital status, country of birth, education, and urbanicity (urban *v.* rural) as independent variables. There was no effect for country of birth, education, or urbanicity and, following Kessler *et al.* (1995), these variables were removed from subsequent analyses. The first model shown in Table 4 investigated the risk of lifetime exposure to trauma in the whole sample, with gender, age, and marital status all proving to be significant predictors. First, females were less likely than males to report

lifetime experience of traumatic events. Secondly, compared with 18-24-year-olds, individuals aged between 25 and 54 were more likely to report traumatic experiences. Finally, previously married individuals were more likely than those who were currently married to report experience of trauma.

The second model investigated the risk of a 12-month PTSD diagnosis in the whole sample. The odds ratios (ORs) reveal two significant findings. First, individuals over the age of 55 were significantly less likely to have met criteria for a diagnosis of PTSD in the last 12 months (compared with 18-24-year-olds). Secondly, previously married persons, compared with married persons, were more likely to have met criteria

Table 5. Co-morbidity of post-traumatic stress disorder (PTSD) with other disorders in the total sample

	Males			Females		
	With PTSD% (S.E.)	No PTSD% (S.E.)	OR (95% CI)	With PTSD% (S.E.)	No PTSD% (S.E.)	OR (95% CI)
Affective disorders						
MDE	51.6 (6.9)	3.8 (0.3)	27.1 (14.1-52.1)	65.1 (6.6)	7.5 (0.4)	23.1 (12.2-43.8)
Dysthymia	2.0 (1.0)	0.5 (0.0)	3.8 (0.5-31.0)	8.2 (2.0)	0.3 (0.0)	27.1 (9.8-74.8)
Bipolar	2.6 (2.0)	0.1 (0.0)	27.0 (1.9-389.7)	0.6 (1.0)	0.1 (0.0)	7.7 (---)
Anxiety disorders						
GAD	40.2 (8.6)	1.7 (0.2)	38.7 (18.2-82.6)	22.0 (4.2)	2.6 (0.2)	10.4 (6.2-17.7)
Panic disorder/agoraphobia	15.1 (4.5)	0.6 (0.1)	27.9 (12.2-63.5)	16.9 (4.0)	2.1 (0.2)	9.5 (4.8-18.9)
Social phobia	23.3 (5.7)	1.0 (0.2)	31.3 (15.9-61.5)	13.3 (3.8)	1.4 (0.2)	11.1 (5.8-21.5)
OCD	9.2 (3.1)	0.6 (0.2)	17.6 (6.3-49.1)	12.5 (3.5)	0.6 (0.1)	24.4 (11.5-51.7)
Substance use disorders						
Alcohol abuse/dependence	37.6 (6.7)	8.5 (0.5)	6.5 (3.6-11.4)	12.4 (3.2)	3.1 (0.2)	4.5 (2.3-9.0)
Drug abuse/dependence	22.6 (5.5)	3.9 (0.3)	7.2 (3.6-14.2)	15.0 (4.7)	1.4 (0.2)	12.4 (5.4-28.5)
Any disorder						
No other diagnosis	14.8 (7.6)	84.6 (0.6)	0.0 (0.0-0.1)	20.3 (5.2)	86.6 (0.5)	0.0 (0.0-0.1)
1 diagnosis	21.4 (6.5)	11.3 (0.6)	2.1 (0.9-5.1)	32.3 (5.5)	9.5 (0.4)	4.5 (2.7-7.6)
2 diagnoses	28.5 (6.4)	3.2 (0.3)	12.1 (6.0-24.6)	25.8 (4.6)	2.6 (0.2)	13.0 (7.8-21.5)
≥ 3 diagnoses	35.3 (7.3)	1.0 (0.1)	56.2 (27.4-115.4)	21.6 (3.3)	1.3 (0.2)	21.0 (12.9-34.0)

for PTSD (with a similar trend for never married persons).

Model 3 investigated PTSD in the subsample of individuals who had experienced at least one traumatic event, while Model 4 repeated that analysis while controlling for trauma type (by using dummy variables to code for each of the different trauma types). Thus, a higher OR in Model 3 than Model 4 for a given demographic variable would suggest an association between that variable and higher impact traumas. Consistent with earlier findings, Model 3 revealed that, of those people who have experienced a trauma, those aged 55 or over were less likely to meet criteria for PTSD in the last 12 months. Similarly, those who were previously married were more likely to qualify for the diagnosis, with a similar trend for never married persons. Although females in the traumatized group appear to be at higher risk of PTSD also, the OR falls on the 95% confidence intervals. In Model 4, controlling for trauma type, the findings are similar: older participants remained at lower risk, while previously married persons (and, to a lesser extent, never married persons) remained at higher risk of PTSD. Interestingly, comparison of Models 3 and 4 for females suggests that trauma type may be an important factor in gender-related vulnerability to PTSD.

Co-morbidity between PTSD and other disorders

Estimates of 12-month prevalence of 10 DSM-IV Axis 1 disorders are shown in Table 5 separately for men and women with and without a diagnosis of PTSD in the past 12 months. Observation of prevalence rates and ORs show a consistent relationship between PTSD and most other disorders. Another Axis 1 disorder was present over the past 12 months in 85.2% of males with PTSD and 79.7% of females. Nearly 50% of females and over 60% of males with PTSD met criteria for two or more additional Axis 1 diagnoses. Males with PTSD were significantly more likely than those without PTSD to meet criteria for all other disorders except dysthymia. Females with PTSD were more likely than those without to meet criteria for all disorders, with the possible exception of bipolar disorder (for which there were insufficient numbers to calculate confidence limits).

DISCUSSION

The current data set provides a fascinating point of comparison with the NCS data reported by Kessler *et al.* (1995). Table 1 suggests that the current figures for trauma exposure are surprisingly similar to the NCS data in terms of both rank ordering of events and actual percentage prevalence for each event. Of the Australian sample, 64.6% of males had experienced at least one event, compared with 60.7% in the US sample. For women, the figures were 49.5% in the Australian sample compared with 41.2% in the US samples. With the exception of female rape, the relative prevalence of each category of traumatic experience was very close across both studies.

As noted above, analyses of PTSD data from NCS are based around lifetime PTSD prevalence, while the current data set reports 12-month prevalence. This makes several potential comparisons problematic, notably with regard to figures reported in Table 2 (P2) and Table 5. The sociodemographic data reported in Table 4 should be compared cautiously also – correlates of lifetime PTSD may not be the same as correlates of PTSD in the previous 12 months (particularly, for example, with regard to age).

Overall 12-month PTSD prevalence rates from the NCS are available (Kessler *et al.* 1999), however, and reveal three times the rate of PTSD in the American compared with the Australian sample (3.9% *v.* 1.3%). This difference is not explained by the frequency of trauma exposure since the Australian sample (both men and women) had slightly higher exposure rates than their American counterparts. There is evidence elsewhere to suggest that higher 12-month rates of DSM-IV mental disorders among the American compared to the Australian population are not restricted to PTSD, although the difference may be more marked in PTSD than in other disorders (Kessler *et al.* 1994; Andrews *et al.* 2001). This large difference in PTSD prevalence, in the context of similar rates of traumatic exposure, is of considerable interest. The current data suggest that the risk of developing PTSD following exposure to trauma is considerably lower in Australia than in the US, implying a cross-cultural difference in resilience to stress. One possible explanation lies in the higher rate of

other DSM-IV disorders in the US sample. It may be speculated that an increased rate of pre-existing psychiatric conditions in that population serves to increase vulnerability to the development of PTSD following traumatic exposure. Indeed, it is well established that prior psychiatric history is a significant risk factor in the development of PTSD (Kessler *et al.* 1999). Another possible explanation for the differences in prevalence rates may lie in the nature of the diagnostic instruments and, in particular, the assessment of impairment and/or distress (Criterion F). This is a difficult area to evaluate in terms of determining a categorical cut-off and it may be speculated that some studies have interpreted this criterion more conservatively than others.

The findings with regard to gender are intriguing. The 12-month PTSD prevalence was 1.2% for males and 1.4% for females. Although slightly higher rates are apparent for females across all age groups except 55 plus, the relative similarity of PTSD prevalence across males and females is unexpected and contrary to much (although by no means all) previous research. The NCS, for example, reported lifetime rates of 5% for males and 10.4% for females, while Stein *et al.* (1997) reported current rates of 1.2% for males and 2.7% for females. A larger gender difference is apparent in the current study, however, among those exposed to trauma (see Table 2). While 1.9% of men who had experienced a traumatic event met criteria for a PTSD diagnosis in the preceding 12 months, 2.9% of exposed women qualified for a diagnosis. (This gender difference is still considerably smaller than the 8.1% for men and 20.4% for women in the NCS sample.)

A comparison of Models 3 and 4 in Table 4 sheds further light on the gender difference in PTSD. When trauma type is controlled, the increased vulnerability for women virtually disappears. In other words, women are more vulnerable to the development of PTSD only following certain types of trauma. In line with the findings of Kessler *et al.* (1995), a comparison of Tables 1 and 2 suggest that, while men were more likely to experience a trauma overall, women were more likely to experience a trauma with a high probability of subsequent PTSD (with the exception of combat). Column P2 in Table 2 reveals that, for both men and women,

sexual molestation and rape were the events most likely to be associated with a diagnosis of PTSD. A total of 12.9% of women had experienced sexual molestation or rape, compared with only 3.8% of men. This finding is in line with other recent work suggesting that the gender difference in PTSD is due primarily to females' greater risk following assaultive violence (Breslau *et al.* 1999; Stein *et al.* 2000). Indeed, the finding that rape was reported more often among American women (9.2%) than Australian women (5.4%) may go some way towards explaining the lower levels of PTSD among the female Australian sample.

Another potential contribution regarding sex differences arises from consideration of relative rates of other disorders. Several epidemiological studies have reported higher rates of affective and anxiety disorders in women than in men (Kessler *et al.* 1994; Andrews *et al.* 2001) and, as discussed above, prior psychiatric history is an important risk factor in the development of PTSD following traumatic exposure. Indeed, Breslau *et al.* (1997) have noted that pre-existing anxiety or depressive disorders may be an important factor in understanding observed sex differences in PTSD. A final issue with regard to gender is that, although North American epidemiological studies have consistently reported a much higher PTSD prevalence among community samples of women than men, there are surprisingly few comparable studies from other parts of the world. Regrettably, the recent National Psychiatric Morbidity Study carried out in Britain (Jenkins *et al.* 1997) did not report PTSD prevalence. Although the work of Perkonig *et al.* (2000) also found a gender difference, theirs was a sample of young people and not directly comparable with the current study. Thus, the current findings are difficult to interpret. In view of the fact that levels of exposure to trauma are comparable across the available studies, do the current figures suggest that Australian women are particularly resistant to the disorder? Whatever the explanation, it may be speculated that cultural differences are influencing the way in which women adjust to, and recover from, traumatic experiences. There is a pressing need for other countries to conduct epidemiological research on PTSD in order to shed light on this intriguing question.

Some consistent findings emerge from Table

4. First, PTSD prevalence among the more elderly (55 plus) age group is surprisingly low. Although this may suggest some kind of 'protective' effect with age, it is more likely to be a function of the fact that 12-month, rather than lifetime, prevalence was examined. This group may have had higher rates in the past, but have shown some recovery from the disorder. In a similar vein, it may also be a function of the fact that, in line with the NCS, the 'most stressful' event was selected as the focus for assessment. For older people, there is more chance that the worst event occurred many years previously. While it may have been associated with PTSD at the time, it is correspondingly less likely that the worst event will be associated with current distress. Interestingly, Model 1 in Table 4 suggests that this group are also at lower risk of experiencing (or, at least, reporting) traumatic events in their lives. Clearly this is counterintuitive – older individuals have more years in which to experience trauma and they may be expected to report correspondingly higher rates. A problem with both the current study and the NCS is that the requirement to recall lifetime traumas may have resulted in some underreporting of traumatic experiences. Presumably, the impact of such an effect would be seen most clearly in older respondents. Nevertheless, the lower PTSD rates in this subgroup warrant further investigation. The second major demographic finding was the higher risk of both traumatic experience and PTSD among those people who were previously married, a finding that is consistent with the NCS data. Those who had never been married also appeared to be at higher risk, albeit only marginally so. This raises many unanswered questions and it is not possible to comment on directionality or causation. Perhaps this group is more vulnerable as a result of their relationship history. Alternatively, it is possible that their greater risk of traumatic exposure and PTSD reflects more stable personality traits that also influence the stability of their relationships. Either way, previously and never married persons should be identified as a high risk group following trauma exposure.

The high rate of co-morbidity with PTSD found in the current study is consistent with the findings of previous research. The current data do not shed light on the extent to which this co-

morbidity predated the onset of PTSD (rather than being additional sequelae of the traumatic event, a result of suffering from chronic PTSD, or completely independent). However, the fact that similarly high rates are consistently found in studies of PTSD populations suggest that, to a large extent, co-morbid conditions such as depression, substance abuse, and other anxiety disorders are secondary to PTSD. This, of course, does not preclude the possibility of shared risk factors. In addition, the large symptom overlap between PTSD and other disorders, notably depression and other anxiety disorders, may contribute to the high rate of comorbidity in this population.

Conclusion

The results of the current study suggest that exposure to trauma is a common experience for the general adult population in Australia and that PTSD is a highly prevalent sequelae of such exposure. Although the overall rates did not differ between men and women in this population, females were at greater risk than males among the subsample of those exposed to trauma. They are also at greater risk of experiencing 'high risk' traumas in terms of subsequent PTSD. The elderly in this sample were at lower risk, and those people who were previously married at higher risk, of both exposure to trauma and the development of PTSD. A large majority of individuals with PTSD also met criteria for other disorders. Studies of this nature are of paramount importance in understanding this complex disorder and there is an urgent need for similar studies among alternative cultural groups.

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